

SOCIAL DESIGN COMPENDIUM

YEAR **2023**



UPM
UNIVERSITI PUTRA MALAYSIA
BERSEKUTU BERSAMA SAMA

SOCIAL DESIGN COMPENDIUM:

REIMAGINING THE BUILT ENVIRONMENT : EXPLORING
INNOVATIVE APPROACHES TO ARCHITECTURE AND URBANISM”

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Universiti Putra Malaysia Press
Serdang • 2024
www.penerbit.upm.edu.my

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Print 2024

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Published by:
Universiti Putra Malaysia Press
43400 UPM, Serdang
Selangor Darul Ehsan
Tel: 03-8946 8851/8429
Faxes: 03-8941 6172
Email: penerbit@putra.upm.edu.my



Cataloguing-in-Publication Data

Perpustakaan Negara Malaysia

A catalogue record for this book is available
from the National Library of Malaysia

eISBN 978-629-7689-02-9

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Foreword

It is with great pleasure and anticipation that I introduce the Social Design Compendium 2023, titled “Reimagining the Built Environment: Exploring Innovative Approaches to Architecture and Urbanism.” This publication marks a significant milestone in our ongoing exploration of the transformative potential of architecture and urban design in shaping a more sustainable, inclusive, and resilient future.

The themes of this compendium reflect our commitment to advancing knowledge and practice in the field of architecture. From the salutogenic built environment to inclusive architecture and dwellings, from sustainability development to resiliency and mobility architecture, and finally, to the preservation and celebration of cultural heritage architecture, each paper offers valuable insights and perspectives that are both timely and relevant.

I would like to extend my sincere thanks to the authors, who are postgraduate students and their supervisors, for their hard work in publication of their research. I am confident that their work will inspire others to push the boundaries of architectural practice and theory.

I would also like to acknowledge the editorial board for their meticulous attention to detail and their commitment to excellence. Their expertise and guidance have been instrumental in shaping this compendium into a cohesive and thought-provoking collection of papers.

I am proud of the work that has been done to bring this compendium to fruition. I am confident that the ideas and insights contained within these pages will stimulate meaningful dialogue and inspire new avenues of research and practice in the field of architecture and urbanism.

I invite you to delve into the pages of this compendium, to engage with the ideas and perspectives presented, and to join us in reimagining the built environment for a better tomorrow.

Thank you.

Ar. Dr. Athira Azmi
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Preface

Welcome to the “Social Design Compendium 2024,” a cornerstone of our ongoing dialogue on reimagining and transforming our built environments to better serve society. This compendium presents a collection of research findings, essays, and case studies in ARC5911 and ARC5912 curated by the Department of Architecture, Faculty of Design and Architecture at Universiti Putra Malaysia. As the Director of this conference, it is my pleasure to introduce this significant work that explores the intersections of architecture, urbanism, and the pressing social needs of our communities.

This year, our focus shifts toward innovative approaches that integrate the concept of salutogenic environments, inclusivity, sustainability, resilience, mobility, and cultural heritage into architectural and urban planning. Each contribution within these pages aims to challenge conventional thinking and propose new paradigms that prioritize human health, well-being, and equitable access in urban settings.

The topics covered address a range of critical issues from creating therapeutic spaces that support mental health to designing inclusive environments for the neurodiverse and the elderly. Our contributors—esteemed educators, seasoned practitioners, and promising students—have provided insights grounded in rigorous research and creative exploration.

As urban populations continue to grow, the need for sustainable and resilient infrastructure becomes more apparent. Therefore, our compendium not only serves as a scholarly resource but also as a call to action for architects, planners, policymakers, and community leaders to collaborate towards more empathetic and functional urban landscapes.

We believe that the diverse perspectives presented here will inspire our readers and conference attendees to advocate for and implement design strategies that are both innovative and inclusive. The ultimate goal is to foster environments where all individuals can thrive irrespective of their age, ability, or socio-economic status.

I hope you enjoy the content as much as we do. Thank you

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SALUTOGENIC BUILT ENVIRONMENT

RETHINKING SAFE SPACES FOR TRAUMATIC URBAN YOUTH: A REVIEW OF THE ARCHITECTURAL DESIGN ELEMENTS OF EXISTING HEALTH FACILITIES

Kok Hui Yen, Mohd Zairul Mohd Noor

ABSTRACT

For traumatized urban youths, a youth safe space can simply be access to refuge, a place where they feel safe and protected as well as being comfortable in their own skin. Youth require secure public areas where they can congregate, participate in activities that cater to their wide range of needs and interests, influence decisions, and express themselves freely. The traumas and mental health problems affecting today's youth are brought to light in this safe space environment, along with what the community can do to support them. However, there is no specific design or guideline for trauma-oriented design to create a safe space for traumatic urban youths. Therefore, this research will formulate trauma-informed design approaches that creates a safe space for urban youths. This research will produce a safe space in rehabilitation design framework for traumatic youths in urban areas. This study will identify the needs of the traumatic community and trauma-informed design in community-based rehabilitation that will help the community cope with the stresses in life and work productively. Future research can conduct qualitative study to look in-depth on the interface between community-based rehabilitation and trauma-informed design in a safe space.

Keywords: *traumatized urban youths; youth safe space; trauma-informed design; community-based rehabilitation; refuge*

INTRODUCTION

While urbanization can have positive effects on health and the economy, it can also have many detrimental social and environmental health effects that are especially harmful to the most vulnerable and impoverished (WHO, 2021). According to the Department of Economic and Social Affairs, youths who are aged between ages 15-30 years old are classified in urban vulnerable groups as they are one of the most affected by urban growth of cities. They frequently congregate in deprived neighborhoods and areas with the least prospects for mobility, employment, and education opportunities, the worst access to health care, and below-average health outcomes. To overcome this crisis, United Nations has provided a 'One Stop Youth Resource Centers'. The main purpose of the youth center is to become a place that "empowers the youthful generation to have ownership of the development process and be agents of transformation in the city." Operationally, the One Stop aimed on enhancing youths' livelihoods by offering "youth empowering services" such as employment training, counselling, recreation, and cultural events, as well as serving as a networking hub for youth and other stakeholders (United Nations, 2022).

Trauma and mental health issues have always been urgently in need of attention. Malaysia as well has begun to take part in the movement to de-stigmatize trauma and mental health problems. This was true before COVID-19 hit Malaysia, and it still is as we are in the recovery phase of the endemic phase. The stigma attached to mental illness and trauma in this nation is among the biggest barriers to treatment. "#YouMatter" programs have been organized to create a safe space for the youth community to share about their about mental health issues. Suria KLCC recently announced that it will collaborate again with the Green Ribbon Group, an NGO that promotes a community approach to youth mental health. Also, as part of this year's campaign's collaboration with MIASA (Mental Illness Awareness & Support Association), artworks by young artists who

have personally struggled with trauma and mental illness were displayed as part of the “Young Art Entrepreneurs” initiative (The Star, 2021). This youth safe space, also known as the Safe Space @ Suria KLCC, is for young people to congregate and talk about their mental health challenges through fostering a more inclusive approach. The traumas and mental health problems affecting today’s youth are brought to light in this safe environment, along with what the community can do to support them. Through this approach, Malaysia has an advanced understanding of trauma and mental health awareness and has brought to a higher level by designing the first and only shopping center in Malaysia to implement a safe space for the community. Figure 1 below refers to some examples of youth safe spaces in shopping centers that are easily accessible to the public community.



Figure.1 Youth safe space in shopping centres
Source: Lifestyle Asia (2021)

Rising trauma cases amidst urban growth in Malaysia has been a concern among urban youths who are more vulnerable and less able to protect themselves as threats and stress factors that affects their physical and mental wellbeing are increasing in cities (Jamaluddin et al., 2022). According to Health Ministry figures, the number of Malaysian students experiencing mental health issues has increased from one in ten in 2011 to one in five in 2016. The main causes of mental health issues among students, according to experts, are anxiety and depression, however the influence of drugs cannot be completely ruled out. The notion of mental health includes a wide range of conditions as not only does it focus on mental disorders, but it also addresses conditions like depression, post-traumatic stress disorder (PTSD), and attention-deficit or hyperactivity disorder (ADHD), (New Straits Time, 2016).

In addition, according to the National Health & Morbidity Survey (NHMS) 2019, 7.9 percent of Malaysian children and adolescents between the ages of five and 15 suffer trauma and mental health issues, while 2.3 percent of Malaysian adults have depression (The Sun, 2020). Young adults and adolescents exposed to traumatic situations display a wide range of symptoms, including not only externalizing issues like violence, conduct issues, and oppositional or defiant behavior but also internalizing issues like sadness or anxiety. According to the Department of Social Welfare, more than 2,000 abuse cases were reported each year, and the number of cases in 2020 stood at 5,858. As many as 2,040 abuse cases were reported in the first four months of 2021 (Jabatan Kebajikan Masyarakat, 2020). Selangor and Kuala Lumpur reported the highest cases of abuse leading to rising trauma cases among the youths, children and adolescent. The reports also stated that the 5000 number of young people requires care and protection due to the abuse they suffer which leads to trauma. In that year alone, the young people in Selangor and Kuala Lumpur areas have the highest number of children, adolescents and youths that requires a place that offers protection and care.

Besides that, the mental health of young Malaysians living in low-resource communities continues to be a topic of concern. According to the recent report by the Ministry of Health (MoH) and the United Nations Children’s Fund (Unicef), “Contributing Factors to Psychological Distress, Coping Strategies, and Help-Seeking Behaviours among Adolescents Living in the Klang Valley People’s Housing Project (PPR)”, “there were higher than average rates of psychological distress among young people from PPR communities”. The report found that, out of the adolescents living in PPRs, 12.3% had psychological distress and 13.4% reported suicidal and self-harm thoughts. While evaluating and treating young people who are involved, exposure to trauma is frequently

overlooked (Ford et al., 2012). There are several obstacles to receiving mental health services, trauma-informed therapies are not readily available for trauma survivors, the health care system is underdeveloped, and there are not enough training institutes to ensure that treatments are effective (Kazlauskas & Zelviene, 2017).

In order to address the issue of providing youths a safe space for education and learning, the non-governmental organization (NGO) Adab Youth Garage (AYG) in Malaysia partnered with the Institute for Social Science Studies (IPSAS) at Universiti Putra Malaysia for a small-scale study on PPR youths' learning needs. The key findings of the study were that lack of support and clarity in learning, learning-related boredom, poor nutrition and lack of physical activity predicted depression, even after accounting for other factors such as the home learning environment, learnt helplessness and self-esteem. All this are the main factors which leads to post traumatic stress disorder. Despite their struggles in the classroom and perceived lack of support, the youth reported high levels of motivation to learn. The results also showed that depression can be significantly higher in some communities as opposed to others, indicating that physical surroundings can affect youth mental health. Sadly, very little has been done to document how PPR youth have fared with their scholastic transfer and the connection between their educational experiences and mental health.

There is a need for the kind of second-chance academic support services that groups like AYG provide, particularly in teaching support and clarity around academic content. AYG investigate the relationship between mental health and experiences connected to learning, both at home and at school. Many public-school teachers must cope with large class sizes and multiple tasks that make it very difficult for them to address every individual student's needs. Current education programs do not cater to the psychological and mental health of youths who faces physical and mental health issues. However, AYG in providing second-chance support services is therefore crucial. Community-based organizations like AYG are often better equipped than schools to meet the broader developmental needs of youth and can play an important complementary role in helping youth cope with life stressors. In addition to academic support, AYG centers act as "safe spaces" to foster supportive relationships between their young clients and professional youth workers, who partner with the youth on activities that build critical life skills and competencies such as volunteering, entrepreneurship, and community development activities. Employing a whole-person approach, AYG has been effective in not only addressing the academic needs of youth from low-resource communities but also in providing hope and a platform for future success. The program acts as a second-chance program for young people who struggle with basic literacy and academic proficiency whereby youths with mental health issues or trauma who are unable to cope with the standard learning content in schools are able to get the opportunity to get formal education through the safe spaces provided by AYG (Abdullah, A. L. K., 2023).

Current rehabilitation facilities or programs does not cater to the physical and psychological needs of traumatic youths as they are not well designed for the safety and comfort of traumatic people. Furthermore, safe space for youths is only limited to counselling rooms in schools which are not conducive and practical. The improvement and redefinition of conventional rehabilitation centers in cities can enhance the effectiveness of treatments for trauma in urban areas, alleviate the societal stigma of trauma and improve the journey of healing through fostering people's skills, interests, and pastimes as well as motivating them to establish new objectives and form relationships that enrich their lives and improve their general quality of life. Hence, reintegrating these traumatic youths back into the society is necessary. The intervention attempts to provide a setting for recovery, a setting for healing, and a setting for financial independence for those suffering from traumas in order to destigmatize medical health centers for post traumatic disorder among the society.

Therefore, this research aims to formulate a community-based design approaches that enhances health and wellness in a safe space for traumatic urban youths. The objectives of this study are as follow:

RO 1: To identify the limitations on youth safe space in existing youth facilities.

RO 2: To formulate a safe space design for traumatic urban youths in the city of Kuala Lumpur that enhances health and wellness in a safe space.

LITERATURE REVIEW

In conjunction to the main research question, literature reviews have been done following the sub themes that have been added to the RQ Construct. Deductive codes that lead to the two sub-topics identified are youth safe space and safe space design.

Youths Challenges in Requirement of a Safe Space

Overbey et al. (2021) states that high rates of teenagers and young adults suffering from trauma, mental health issues, adjustment challenges, problem behavior, disengagement, or disaffection have prompted concerns. Most of these concerns are found in low-income and high crime rate neighborhoods. The various negative effects of being exposed to community violence have been extensively studied, however far less research is being carried out to study how and where young people feel safe and strong while residing in high-crime rate areas (DaViera et al., 2020). Furthermore, young people's voices are frequently disregarded and underrepresented in inequities, despite greater attention to adolescence. Youths are acutely aware of harmful health effects and social disparities among them, and public health interventions are now ineffective and inequitable. Youth perspectives and experiences indicate the need for age-specific and citywide structural policies for them, especially in underprivileged areas, to ensure they lead a balanced and healthy lifestyle (Tinner, 2022).

Other studies suggest that youth lifestyles and the area they lived in are big contributions to trauma. Including housing instability, neighborhood violence, and other poverty-related hardships, youth in underprivileged metropolitan settings are commonly subjected to chronic stress and trauma (Mendelson et al., 2020). Targeted mental health approaches have been organized for youths, however, stigma, a lack of resources, and the challenge of identifying all pupils who may benefit from intervention are obstacles to in-school screening. Regardless, this paper lacks the investigation towards how universal school-based interventions affect the urban youths' academic, emotional, and behavioral functioning and how they benefit society.

There are also other factors such as cost and budgets which leads to some schools being unable to afford to hire counsellors and are unable to implement these programs (Scannell & Scannell, 2020). This affects their mental health as an adult because significant physical and emotional growth occurs at their youth age. The experience they encounter helps to shape their growth and perspectives.

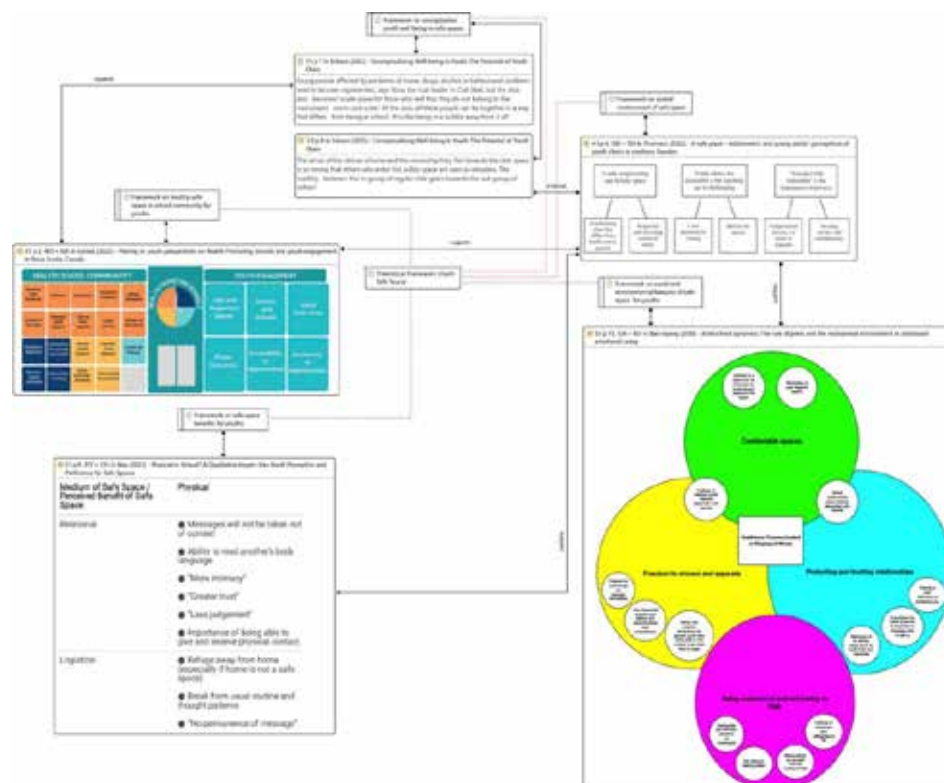


Figure.2 *Theoretical Framework on Youth Safe Space*
Source: Author (2023)

The theoretical framework in Figure 2 concludes that youths' safe spaces is like a 'HOME' with a sense of ownership and intimacy. A refuge place to create new bonds and freedom to make decisions and to be who they are without judgement. A safe space must be a physical space because There are some aspects that are lacking when verbal information is converted to text, and you don't get the full picture of the person's issue. In addition, physical settings are their preferred choice of safe space because they foster greater trust, more intimacy, and reduced judgement (Kontak et al., 2022). The traumatized individuals felt more comfortable sharing more when they knew someone was listening to what they had to say, especially when it came to delicate subjects that affected their emotional wellness. It is also mentioned how vital it is to be able to physically hug someone to help them feel comfortable.

Elements of Safe Spaces

The rehabilitation of youths with psychiatric disorders remains a challenge and there is a pressing need to identify innovative approaches to complement conventional care in addressing the increasing prevalence and severity of mental illness in the younger population (Archambault et al., 2020). Clinical recommendations support the use of trauma- focused therapy with individuals who are experiencing psychosis as they have been found to be successful treatments for post-traumatic stress disorder (PTSD) (Chadwick & Billings, 2022). It is well known that trauma permeates society and has an impact on how people with mental illnesses develop, behave, and are treated (Nation et al., 2022). Furthermore, those suffers from mental health issues and those who have experienced trauma disproportionately are impacted by the lack of widespread adoption of person-centered treatment in healthcare settings (Bassuk et al., 2017).

Schools play a crucial and vital role in intervening and fostering children's resilience when they encounter stress and hardship in their communities and at home (Herrenkohl et al., 2019). However, certain schools lack the capacity to offer counselling to youngsters, while there are also some schools that have been successful in implementing unique programs that support youth with their social and emotional needs. There is also a lack of the study on the urgent need for safe spaces among young people today, as well as how society may meet these demands in a time when social interaction is scarce. When it comes to their health and wellbeing, youths are a diverse group with unique requirements thus it is important to learn more about the essential elements of youth friendliness and to comprehend youth-friendly health care from the viewpoint of children, adolescents, and young adults (Thomson et al., 2022).

There is also the rising consensus among those in the therapy professions to use talking therapy in unconventional settings, such as open-air areas as an alternative safe space. Further organizational impediments included a general lack of orientation, support, and direction within professions with regards to alternative therapy venues, as well as outdoor areas being perceived as a poor fit in services where a dominant reductionist and biomedical treatment model predominate (Cooley et al., 2022). In addition, therapy such as arts-based programs help in the distinctive role that recovery processes play by facilitating self-expression and communication, socialization and enhances personal identity which can be incorporated in school-based interventions. Little is known about how these programs are viewed by health professionals who can send people with mental health issues to community-based psychiatric rehabilitation services, despite the rise in arts-based programs in community rehabilitation services in many countries (Oren et al., 2019).

Various artistic activities are being increasingly put forward and investigated in the area of psychiatric rehabilitation most of which are only run by non-therapist artists or art instructors. Despite that, this paper lacks the study on how art-based interventions are associated with improvements in diverse aspects relevant to mental health recovery. Therefore, a youth "safe space" is required in order for the crucial processes of elicitation,

building trust, finding one's voice, sharing ideas, and developing a shared vision to take place. (Mulvale, 2019).

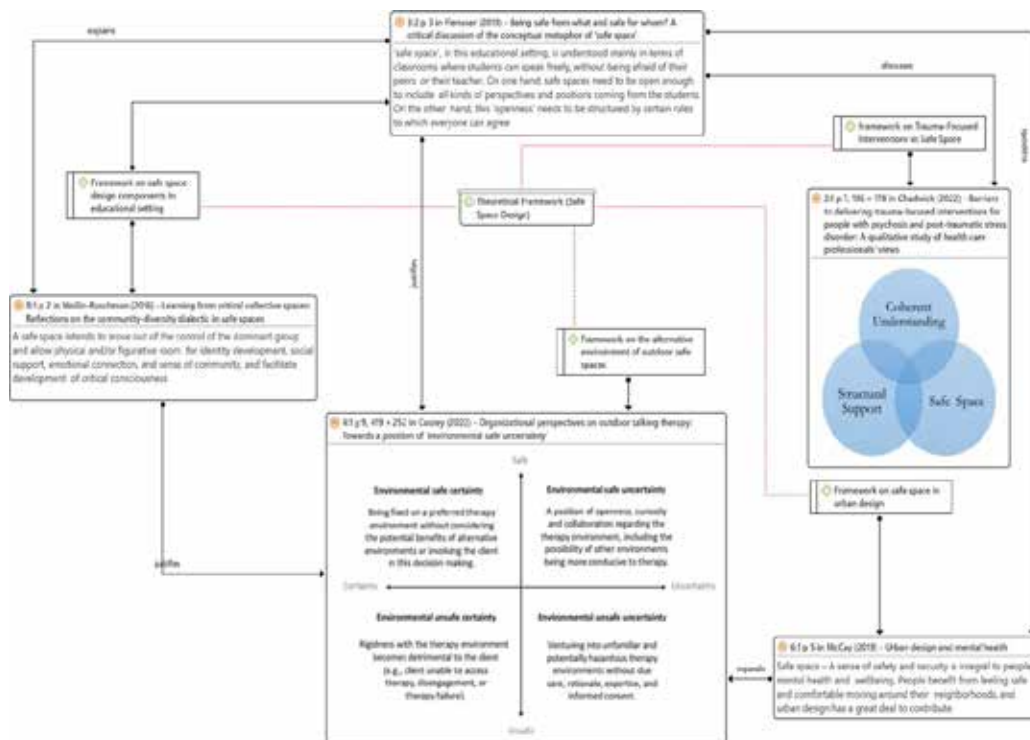


Figure.3 Theoretical Framework on Safe Space Design
Source: Author (2023)

The theoretical framework in Figure 3 concludes that safe spaces require a degree of ‘openness’ and at the same time create a sense of safety and security (Flensner & Von der Lippe, 2019). Safe uncertainty environment should be encouraged whereby the therapy work is structured and guided by a formulation of a safe, yet remains open and curious towards new possibilities, collaboration with others, thus creating a more conducive healing environment (Cooley et al., 2022). Urban design also plays an important role when creating a safe space. The traumatic youths benefit from a secure environment and feel at ease travelling around their neighborhoods, and there is a lot that urban design can contribute. Urban risks include those posed by other people, traffic, being lost, environmental toxins, and traffic. Important urban design interventions include things like proper street lighting and monitoring, recognizable landmarks that help residents with dementia traverse their neighborhoods, and routes that are centered on people (McCay, 2019). Hence, for a rehabilitation environment that might increase comfort and accessibility, a balanced strategy is required. and at the same time the need to avoid being affected up by other environments and outside social communities.

METHOD

The research methodology constitutes of three main stages which are an observational study, expert interviews to assess the issues, and potential solution recommendations to create a potential safe space for traumatic youths in urban areas. Observational study consists of direct observations of the safe spaces provided by the government and other NGOs. Next is expert interview, which is based on their opinions and how they view the issues. This qualitative study aims to identify the issue of current health care facilities in Kuala Lumpur, the gaps that can be improve and suggests a design guideline on how to design an open community-based design approaches that diminishes the indoor and outdoor boundaries of a safe space for traumatic urban youths. The research will be conducted by conducting desk reviews and interviews among the specialist in health sectors as well as architects’ expertise in designing health care facilities as shown below in Figure 4. The goal of the study is to provide local authorities with design guidelines for rejuvenating the trauma in urban cities through safe spaces and enrich the healing environment of the people through alternative healing and to benefit potential stakeholders by advocating for more safe spaces in urban environments. The study aims to contribute to the field by offering a framework on open

community-based design approaches that diminishes the indoor and outdoor boundaries of a safe space for traumatic urban youths, and it suggests that future research could explore other forms of safe spaces in different urban areas.

RESULTS AND DICUSSION

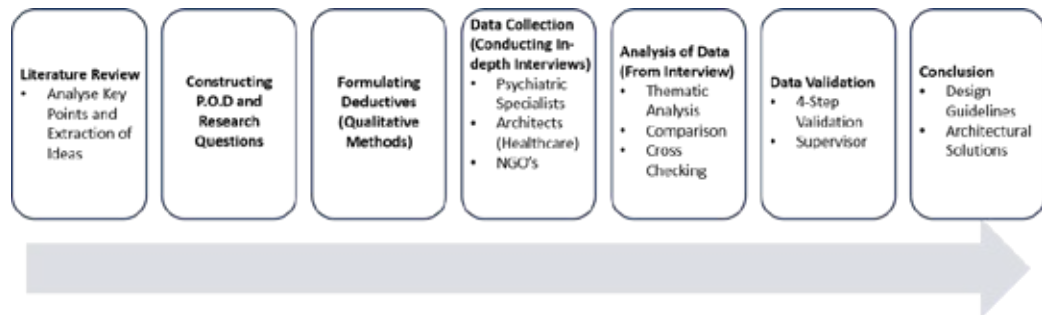


Figure.4 Research Methodology
Source: Author (2023)

Thematic analysis matrices are often used as a tool to organize and analyze qualitative data in research studies. The matrix examines the inductive codes and categories connected to the current existing limitations of safe spaces and identifying the design considerations that should be adapted into the design of a safe space using a thematic analysis technique. Before producing the interview questions for data collection, the main research question and sub research question is identified along with the deductive as shown below in Table 1. The research questions help determine the scope and focus of the interview questions. Through that we are able to focus on who are our informants and who should we focus our interview on. The interview transcripts are examined as additional data, and a thematic analysis matrix is used to classify the identified codes within the preset qualitative data themes.

Table.1 Thematic Analysis Matrix (TAM)

Main RQ: What are the open community-based design guidelines implemented in order to create a safe space that diminishes the indoor and outdoor boundaries for traumatic urban youths in the city of Kuala Lumpur?					
Aim of Research: To formulate an open community-based design approaches that diminishes the indoor and outdoor boundaries of a safe space for urban youths.					
Informants: Counsellors, Psychiatric Specialist, NGO's					
Sub Research Questions	Deductive	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
What are the current limitations on youth safe space in the urban area?	Youth Safe Space	In-depth Interviews, Desk Review, Observation	IQ1: Who are the traumatic youths? IQ2: What are the triggering factors of urban areas that causes trauma among youths? IQ3: What are the disadvantages of the existing facilities provided for the traumatic youths? IQ4: How do you define a safe space for traumatic urban youths? IQ5: What are the challenges and difficulties when providing a safe space for youths and how does a safe space benefit the traumatic youths? IQ6: Do you think a safe space is important? If yes, how do you encourage / promote safe spaces for people with trauma?	Various needs Diversity of perspectives Inadequate Resources Inaccessibility Lack of awareness Stressful Environment Non-Privacy	Limitations on youth safe space in urban areas are: Theme 1: Needs and Resources Theme 2: Perspectives and Awareness Theme 3: Accessibility and Privacy Theme 4: Wellbeing

Source: Author (2023)

Main RQ: What are the open community-based design guidelines implemented in order to create a safe space that diminishes the indoor and outdoor boundaries for traumatic urban youths in the city of Kuala Lumpur?					
Aim of Research: To formulate an open community-based design approaches that diminishes the indoor and outdoor boundaries of a safe space for urban youths.					
Informants: Counsellors, Psychiatric Specialist, NGO's					
Sub Research Questions	Deductive	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
How to formulate a safe space design for traumatic urban youths in the city of Kuala Lumpur?	Safe Space Design	Desk Review, In-depth Interviews	IQ1: What are the components / factors that needs to be considered when creating a safe space? IQ2: How does one create a healing safe space that considers the physical and psychological safety of the traumatic users? IQ3: What is the overall ambience or atmosphere that a safe space aims to achieve to heal traumatic youths and what are features required to enhance the overall spatial quality of a safe space? IQ4: When undergoing treatment, experiential qualities of traumatic people should be taken into consideration. What are the design considerations implemented in your safe space? IQ5: Are there currently any safe space provided? Can you elaborate in detail about the existing safe spaces?	Spatial Quality Views Greeneries Connectivity and Wayfinding Urban Area Flexible Design Inclusivity Private and Quiet Safe Daylighting and Natural Ventilation Materials Spatial Quality Color Code	Design considerations for a safe space shall include: Theme 1: Urban Design Theme 2: Design Principles and User Experience Theme 3: Sustainability and Natural Elements

Source: Author (2023)

The data collected is then divided into distinct categories to enable focus analysis. Each coding is classified into various themes for each sub RQ and thus final theme is generated. The findings show that “Limitations” and “Design Considerations,” which emerged as the major themes generated for each sub RQ from the data analysis, are two prominent inductive codes.

From the first sub RQ, the main theme generated will be about safe space constraints in urban areas. The theme highlights about lack of resources and the various needs of the traumatic youths that needs to be catered, the community perspectives about trauma and the lack of awareness due to stigma of the society and the location of safe spaces that is not easily accessible and the lack of privacy and safety of the traumatic people when using a safe space as well as the stressful environment of the safe space which makes it uncomfortable for the traumatic users. Overall, this highlights the limitations of existing safe space facilities. From the second sub RQ, the main theme generated will be about urban infrastructures and spatial design. The theme highlights about the urban design of the safe spaces, the design principles that should be integrated in a safe space and the user experience in order to create a therapeutic healing safe space and the sustainability and the natural elements that should be incorporated in order to create a safe space that is green, sustainable and efficient. Overall, this highlights various design considerations that is required when designing a safe space.

The first main theme area is about inadequacy of healing environment whereby the questions provided aims to identify the shortcomings of the current government and nongovernmental organizations (NGO's) provided for youth safe spaces. Despite having mental healthcare facilities and organizations providing safe spaces, very little is known about them. Traumas and mental health issues are increasing in an alarming rate and the current facilities are not efficient in overcoming the traumas and mental issues. Figure 5 below refers to the thematic network that covers the various issues with the existing facilities faced by both government and nongovernment bodies as well as the connectivity and wayfinding of how the traumatic youth community seek for help. Mr. Afiq (2023) mentioned that “there are also difficulties in collaborating with schools as schools do not provide cooperation to raise awareness regarding this issue despite monetary rewards are provided ... the lack of initiatives by schools is a concern as most of the traumatic cases comes from school-going youths”. Pam Goodwin (2023) also mentioned “the main challenges are

the lack of professionals in this field. The number of professionals is unable to keep up with the rising trauma cases that are increasing each year... the appointments times can be very long... take you 2-3 months to see a psychiatrist or psychologists” and Ms. Anisa (2023) mentioned “it is very difficult to find a healing facility that is located nearby a public transport or accessible by public transportation... the barrier of people unable to afford to pay for Grab thus they have to take the public transport which is very inconvenient if it is located very far away”.

In addition, the lack of awareness and the diversity of perspectives from the society regarding knowledge of youth safe spaces are one of the main challenges when providing safe spaces for youths. This is further expanded by Mr. Fawwaz (2023) “there is a lack of focus training at home... lack of support from teachers as well as their parents... the acceptance of the community towards youth who suffers from trauma and physical or mental health issues... the stigma of parents who cannot accept that their child requires special needs... difficult to inculcate all the issues and problems faced by the youths to the public due to the learning culture that is not open-minded. Mr. Afiq (2023) also mentioned “majority of the people are unknown to all these traumas and mental health due to the lack education among the parents that leads to youths being unaware as well”.

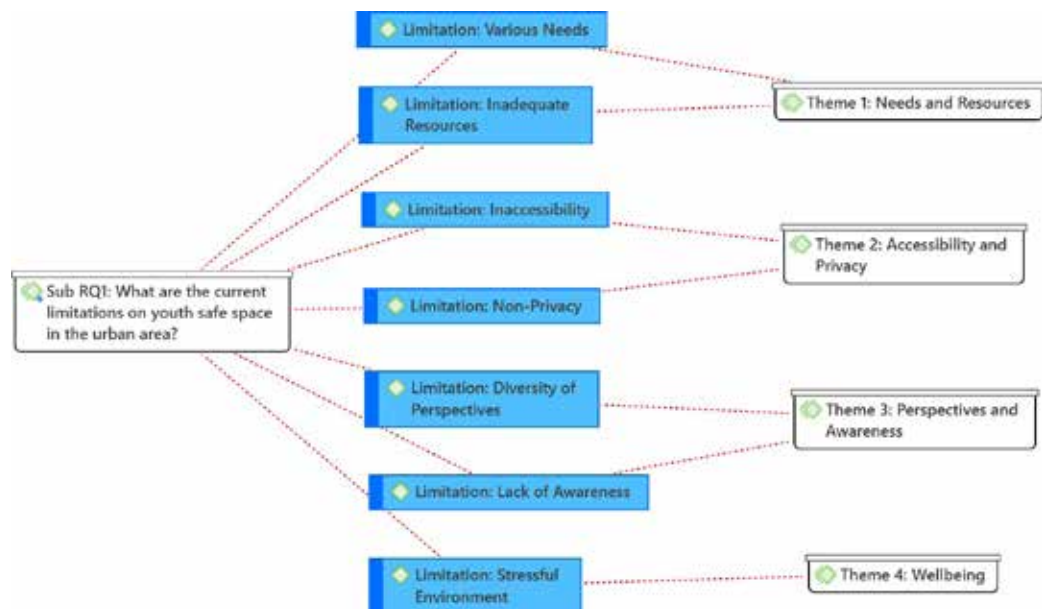


Figure.5 Thematic Network for Theme 1 – Safe Space Constraint.
Source: Author (2023)

The second theme is about urban infrastructures and spatial design whereby the questions sought to identify the type of design aspects that is required or to be taken into considerations when designing a safe space. Design considerations are crucial in safe spaces in order to provide the optimum environment for traumatic youth community to recuperate and overcome their trauma. Urban designs are emphasized to allow the traumatic youths easy access to seek help and treatments whenever and wherever needed. Spatial designs are required to take into considerations as well to provide the most suitable healing space that is safe and maximizes comfort of the users. Natural elements are also emphasized by most of the organizations as it plays an important role during their healing journey. The theme covers the type of design elements in a safe space.

Figure 6 below refers to the thematic network showing urban design and infrastructures considerations that should be implemented and taken into considerations when designing a safe space. Connectivity of safe spaces to the nearest public transport services and easy wayfinding

for traumatic youths to seek help and treatment are essential when providing a safe space. Mr. Fawwaz (2023) mentioned “safe spaces must also be permeable to pedestrians by locating at ground level and it must be walking distance from the neighborhood community... enhances the safety and security of the traumatic youths with clear sightlines of the community so that they don’t feel trapped and insecure”. Mr. Afq (2023) also highlights “the safe spaces should also be near other facilities such as eateries, libraries, commercials for traumatic youths to get what they want and do what they want during their free time”.

Moreover, a safe space design can positively impact psychological well-being by reducing stress, anxiety, and fear. Thoughtful consideration of elements such as natural lighting, ventilation, materials, and comfortable spatial arrangements can contribute to a calming and supportive environment, comfort, a sense of security, and inclusivity for all occupants and a positive user experience. Ms. Anisa (2023) mentioned “A ‘HOME’ like healing safe space that has proper daylighting and ventilation as well as warm tone colours are provided to maximise the spatial quality for the users ... decorated with a homey vibe and warm lighting ... avoid a safe space that has a clinical vibe that is mostly found in healthcare facilities”. This is further expanded by Mr. Kenny (2023) “the types of spatial arrangements and furniture arrangement is incorporated such that none of the furniture’s are at 90-degree angle... arranged to encourage comfortable and engaging conversation ... creating intimate groupings or conversation areas”.

Safe spaces shall also be physically accessible to individuals with disabilities. This includes providing ramps, elevators, accessible restrooms, and designated parking spaces. Consider the needs of individuals with mobility impairments, visual or hearing impairments, or other disabilities to ensure equal access to all areas of the space. Creating a safe space where all individuals are treated with dignity and respect, regardless of their race, ethnicity, age, religion, or any other disabilities is crucial. Ms. Anisa (2023) highlights that “there are many traumas that people suffers from and people from different cultures and identities... as the person providing services, there is a need to respect each and every person’s identities that come to the safe space... the safe space should foster a culturally sensitive environment that acknowledges and respects the diversity of individuals”.

Moreover, flexible design in a safe space is an approach that allows for adaptability and versatility, enabling the space to meet changing needs and accommodate various activities or occupants. Mr. Afq (2023) mentioned that “mobile safe space act as platforms for community engagement and empowerment for youths... facilitate dialogue, workshops, skill-building sessions, or recreational activities, fostering social cohesion and resilience for youths who are unable to reach the their permanent safe space”.

Besides that, sustainability and natural elements can provide a healthy, rejuvenating, and environmentally responsible environment for individuals and at the same time contribute to a more sustainable future and promote the well-being of both users and the surrounding ecosystem. Ms. Pam Goodwin (2023) mention that “exposure to nature or views of green spaces can expedite healing processes, reduce pain perception, and enhance overall patient well-being... well-placed greenery can provide privacy and screening, particularly in outdoor safe spaces... shielding the area from external views and enhancing the sense of security and seclusion”. She also mentioned that big windows with proper daylighting that provides a well-lit space and natural ventilation to improve overall comfort, indoor air quality, and energy efficiency of a space. Besides enhancing the indoor environment of the space, the natural elements also help to reduce the overall cost especially air conditioning and lighting. Sustainable material such as timber should be incorporated. Mr. Fawwaz (2023) highlighted that timber material in a safe space enhances the biophilic connection, fostering a sense of harmony with nature. Exposure to natural materials, such as timber, can positively impact mood, stress reduction, and cognitive performance.

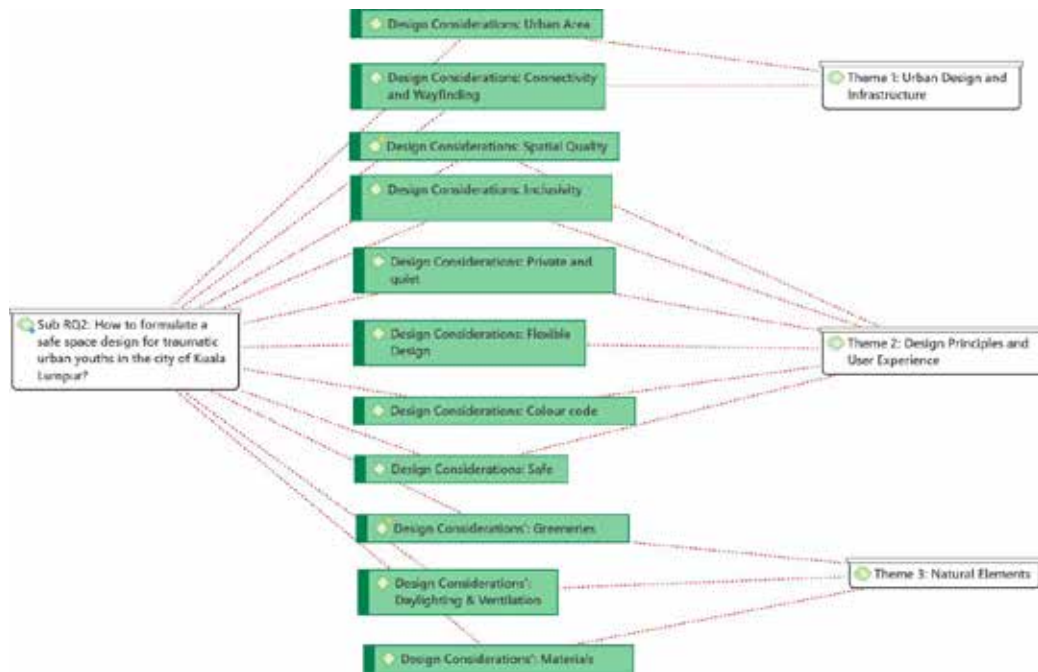


Figure.6 Thematic Network for Theme 2 – Urban Infrastructures and Spatial Design.
Source: Author (2023)

Through the in-depth interview with the experts, there are many safe spaces and healthcare facilities that are being provided for youths in the urban areas of Kuala Lumpur. However, the experts have identified that there are still lots of shortcomings and limitations in the current existing facilities. These limitations should not be overlooked as the trauma cases are increasing every year. The experts highlighted that the stigma of the society towards trauma and mental health in youths is very common in urban areas and action needs to be taken against the stigma. Rajendran (2016) states young people are now working to create inclusive, universal alternatives, particularly in the arts, are crucial contributors to the process of moving towards more powerful choices that take cultural diversity and permeability into account. However, the analysis from the experts shows that there is lack of initiatives by youths to promote about trauma and mental health in their age group towards the society and the lack of action taken to voice out about this rising issue. The experts also mentioned that another limitation is the funds and resources needed to serve the various needs of the traumatic youths. Overall, the analysis only highlights the existing limitations in urban areas and not including rural contexts as well as other age groups.

In addition, the expert's discussion mentioned that design consideration of a safe space shall be enhanced as there are many aspects that are lacking in the current healthcare facilities thus creating an unhealthy environment for people with trauma and mental health issues. From urban design down to the tiny detail of spatial qualities, and visual exposures to the natural elements required to promote a positive and healthy safe space. As stated by Ma. N et. Al (2021), in the daily life of traumatized people, humans need various visual access and exposure spaces, either an open space to partake in social activities or a quiet space with low visual exposure values for self-communion. In conclusion, the experts have a positive outlook on this research and this research can contribute to the development of new architectural guidelines for a youth safe space design.

Thereafter, the data collection was summarized followed by the overall summary and discussion of the findings. The discussion of the findings highlights the key themes, patterns, or concepts that were identified through the analysis of the data. The findings are then compared with previous studies and existing literature in the field. The areas of convergence or divergence between the data analysis and those of other researchers are identified. The limitations of the qualitative research have been identified areas for future research based on the findings has been proposed. The significance of the qualitative research findings highlights the contribution of the study and its implications for the field.

CONCLUSION

In conclusion, the purpose of this research is to identify the issue of current safe spaces for traumatic youths in urban areas, the gaps that can be improved and suggests a design guideline on how to design an open community-based design approaches that diminishes the indoor and outdoor boundaries of a safe space. It has been discovered that the characteristics of a safe area where traumatized adolescents spend their time have a significant impact on their development. Thus, the provision of a safe environment is a crucial element of successful community adolescent health promotion programs that seek to promote good youth development and integrating themselves back to the society. By integrating physical security measures, elements that promote psychological well-being, and opportunities for social interaction, safe spaces can be designed to enhance the overall experience and sense of security for individuals.

A safe space offers a place for rehabilitation, a place for healing and a place for social cohesion for those suffering from traumas in order to de-stigmatize medical health centers for post traumatic disorder among the youth society. First, thorough research should be carried out on improving the experiential and spatial quality of a healing safe space for youths. With current advancements in technology such as the use of smart surveillance systems, sensor-based monitoring, and innovative security solutions shall be integrated into safe space design. Innovative technologies can help to support trauma recovery and provide additional coping mechanisms for traumatized youths.

Additionally, design elements, such as lighting, acoustics, and spatial layout, can positively influence mental well-being will help in creating spaces that promote psychological resilience and reduce stress. The design elements integrated contributes to a sustainable and resilient safe space which will be crucial in long-term safety and well-being as well as long-term maintenance. This includes incorporating features like energy efficiency, climate adaptation, and disaster preparedness into the design of safe spaces. The importance of involving the community during the healing process is also crucial. Engaging users and stakeholders from diverse backgrounds will ensure that their voices and needs are heard, fostering a sense of ownership, and enhancing the effectiveness of safe space design initiatives. Collaboration with the government and sharing knowledge among the professionals, organizations and local communities, as well as education and awareness campaigns all play vital roles in understanding and effectiveness of safe space design for traumatized youths. These recommendations will contribute to the development of evidence-based guidelines and best practices that prioritize the well-being, healing, and recovery of traumatized youths within safe environments in urban areas.

ACKNOWLEDGEMENT

I take this opportunity, to acknowledge some of the people, who have made a major contribution to the development of this research. First and foremost, I would like to express my sincere gratitude to my research supervisor, Assoc. Prof Ts Dr Mohd Zairul bin Mohd Noor, for giving me the opportunity to do research and for providing invaluable guidance throughout this research process.

He has greatly influenced me with her guidance, supervision, encouragement, and motivation which helped me to overcome the hardships encountered during this study. He taught me the approach to carry out the research and to present the findings in a clear and concise manner. It was a wonderful pleasure and joy to work and learn under his supervision. I would also like to thank the faculty office at Universiti Putra Malaysia's Faculty of Built Environment for their guidance and help throughout the procedure. I would also like to express my appreciation to the various experts, researchers, and professionals in the fields of wellness and mental health in youth development. Their extensive body of work and contributions have been critical in shaping my understanding of the subject matter and have provided valuable insights into my research of safe space design for traumatic youths through open community-based design.

Last but not least, I am extremely grateful to my parents for their support in helping me with these studies through their support, care, and sacrifices in order to make this research a success.

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INAUGURATING HEALING AND THERAPEUTIC ARCHITECTURAL CONCEPTS IN MENTAL HEALTH-AIDING FACILITIES FOR URBAN YOUTHS

Wan Nurin Ameyrah Khayrin Wan D'zlyshah, Zalina Shaari

ABSTRACT

Mental illness is the second biggest health issue affecting Malaysian youths in rapidly growing cities and is the leading cause of disability in Malaysia. This phenomenon calls for prompt architectural intervention to create better environments for urban youths. However, the current practice in designing mental health-aiding facilities does not include design decisions that create healing and therapeutic environments for urban youths to improve their mental well-being. Thus, this research aims to adapt necessary technologies and design systems to create an ideal model of healing and therapeutic spaces in urban mental health-aiding facilities to improve the mental health of urban youths. A qualitative study through literature review, archival analysis and interviews was conducted to discover issues in urban areas that leads to mental health decline among urban youths and how therapeutic and healing architecture can combat it. This study contributes a design framework for a better mental health-aiding facilities as the basis for the government, government-linked companies (GLC) and non-profit organization (NGO) to address the issue of mentally-ill urban youths. It is recommended for future research to look in depth at how this study can be applied to people of different age groups.

Keywords: Healing Architecture, Therapeutic Architecture, Mental Health, Urban Youths

INTRODUCTION

Mental health is a state of mental well-being that enables people to cope with the stresses of life, realise their abilities, learn well, work well, and contribute to their community (World Health Organization (WHO), 2022). The world is an evolving place that constantly changes from time to time. According to WHO (2021), these changes significantly impact human mental health, especially among urban youths in fast-growing countries like Malaysia. While keeping up with other countries, Malaysia has grown to be one of the most rapidly urbanised regions worldwide, with an increase of 8% within the last ten years, with Kuala Lumpur being its most populated city. This has directly caused substantial social, economic and environmental transformations that will lead to a handful of stress and mental health decline among urban youth (United Nations Population Fund, 2020).

The issue is heightened when there has been a spike in mental health cases in Malaysia, especially after the COVID-19 Pandemic Lockdown recorded 3 out of 10 Malaysians have a mental illness, with 1 out of 5 individual depressed and 2 out of 5 anxious (Ministry of Health Malaysia, 2020a). The rising anxiety, depression and PTSD cases in Malaysian cities are alarming and have taken a toll on the country forcing prompt action. The Ministry of Health Malaysia (2020b), through their National Health Morbidity Survey states three factors affecting the mental health of Malaysian youths: biological, social and psychological. Biological factors includes factors such as physical, genetics, metabolism and neurological condition of an individual (American Psychological Association, 2021). Social factors include general factors at the level of human society concerned with social structure and social processes that impinge on the individual (Upton, 2013). Psychological determinants of mental illness include negative self-concept, sensitivity to rejection, neuroticism, rumination and negative emotionality (Remes, Mendes & Templeton, 2021). These three factors are greatly influenced and affected by the environment and surroundings, making it crucial to create a conducive environment for citizens especially urban youths that are very much affected nowadays.

The locality of the study takes into consideration the statistics of mental illness around Malaysia, and it is recorded that the most affected states are in the central region, with the highest statistics of 43.2% in Selangor, 41.2% in Putrajaya and 40.4% in Kuala Lumpur according to National Health Morbidity Survey (2017). On the other hand, the most affected group are those aged between 16 to 35 years old, equating to the youth population, with at least 30% of them affected at some point in their lives (Ministry of Health Malaysia, 2020).

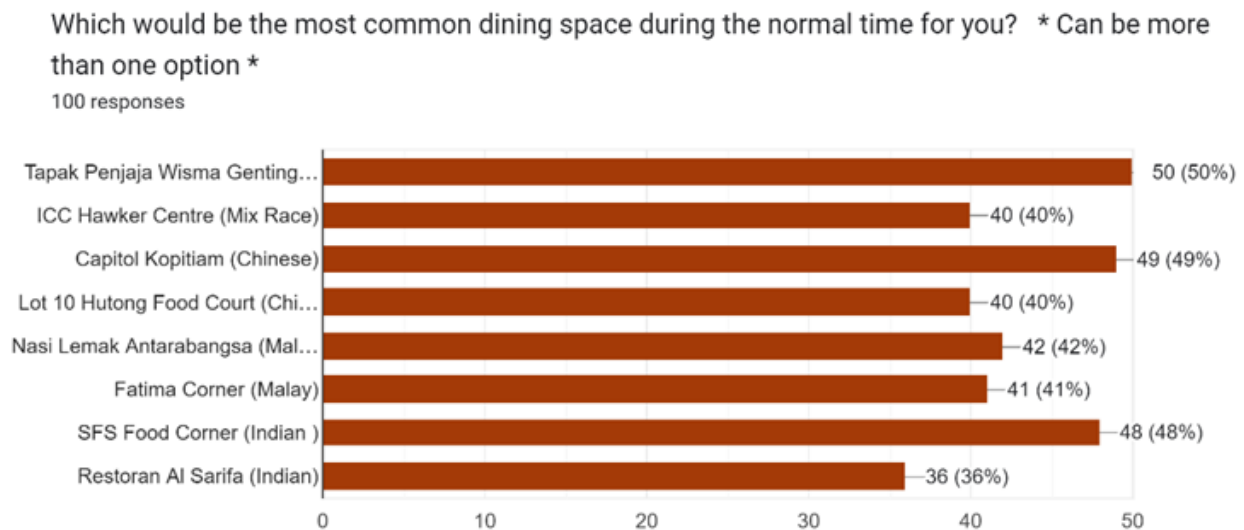


Figure 1.1 - Population Percentage of Mental Illness According to States in Malaysia (Source: National Health Morbidity Survey, 2017)

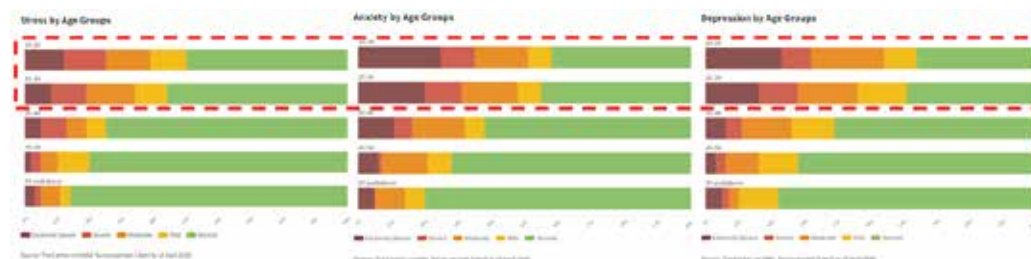


Figure 1.2 - Prevalence of Mental Illness According to Age Group (Source: National Health Morbidity Survey, 2017)

Besides, there are little to no specific design framework to adapt healing and therapeutic architecture into mental health-aiding facilities, especially with land and space constraints in rapidly growing cities. The ability to defy this will better foster mental health for urban youths. Thus, it is of utmost importance to investigate how healing and therapeutic architecture can be integrated into mental health-aiding facilities to improve mental health of urban youths in rapidly growing cities. This study focuses on creating a better-built environment for urban youths, the most vulnerable group prone to mental health issues in urban areas. It aims to contrive a design framework for healing and therapeutic mental health-aiding facilities in fostering better mental health amongst urban youth in rapidly growing cities.

The main research question to contrive a design framework for healing and therapeutic mental health-aiding facilities in fostering better mental health amongst urban youth in rapidly growing cities. In order to come up with this, sub-research questions were deduced which are what are the issues in urban areas that lead to the declining mental health of urban youths and how can therapeutic and healing architecture help improve the mental health of urban youths in rapidly growing cities. This leads to the objective of the study which are discovering issues in urban areas that leads to the declining mental health of urban youths and exploring the effects of therapeutic and healing architectural strategies on mental well-being of urban youths.

LITERATURE REVIEW

The current rising mental health cases in rapidly growing cities prompted this study to discover effective methods to improve the mental well-being of urban youths. The healing and therapeutic architectural design framework formulated from this study would become the basis for developing mental health aiding facilities to improve mental well-being of urban youths in rapidly growing cities. This research benefits many parties especially the Ministry of Health Malaysia in guiding the local authorities and policymakers in providing healing and therapeutic mental health-aiding facilities for urban youths.

The literature review on issues in urban areas that leads to the decline of urban youths' mental-health steered to rapid urbanization. Rapid urbanization is defined as the fast increasing shift in the number of people living in urban areas and a decrease in those living in rural areas that causes a drastic increase in developments in a city (United Nation Population Fund, 2020). Kamyar, Riza and Ilkan (2018), stated that the world urban population for the first time in 2007 exceeds the rural population. The United Nations (2015) based on the current trend believe that by 2050 about two third of the world population will live in the urban area. This is a worrying statistic as rapid urbanization can cause many social, economic and health problems among city dwellers. Though it is driving the economies of most of the nations of the world, a serious concern regarding the impact of urbanization on mental health is warranted especially in South-Asian countries (Trivedi, Sareen & Dhyani, 2008).

Mental health among urban youths in rapidly growing cities is meteorically declining. According to Frissen et al. (2017), the urban environment is one of the proxy environmental factors for psychotic disorders. This theory is supported by Buttazzoni (2022), who emphasizes the distinct relation between rapid urbanisation in rapidly growing cities and the decline of urban youths' mental health because built and natural environments are the most important health determinants. Due to clustered high-rise buildings in cities, the mind unconsciously perceives it as a stressing factor that will eventually progress into mental disorders, especially among vulnerable groups like urban youths. Avoiding that, introducing nature-based reference points in cities that invoke a creative, relaxing and healing sense can reduce mental triggers in urban youths. This is because emotional connection with nature induces endorphins in the human body allowing them to feel calm and serene.

In addition, noisy urban environments can reduce social cohesion and the restorative quality that a living neighbourhood should embody. This will increase the probability of mental health disorders such as anxiety, depression and impaired cognitive function among youths (Minaker & Doherty, 2022). Similarly, a study by Larcombe (2019) states that youths living in urban high-rise buildings have poor mental conditions due to sound and air pollution, apart from the tight spaces they are bounded with. This will result in social isolation among urban youths due to their limited engagement space for them to interact and socialise. Thus, therapeutic and healing spaces incorporating nature-based designs can reduce the risk of mental health decline among urban youths. Nature is also considered the best form of sound and air barrier that absorbs pollutants while giving a serene and therapeutic feeling.

Other than that, psychological factors significantly impact the decline of mental well-being of urban youths. Unfortunately, some urban youths live in a stressful environment with familial abuse and financial crises. This phenomenon will act as a psychological stressor that instil fear, anxiety, social defeat and humiliation (Manning, 2018). Thus, a safe healing and therapeutic space within a neighbourhood is important to pave the way for these helpless urban youths to seek help before their mental condition worsens, leading to self-harming and suicidal behaviour. Sharing problems and worries for mentally-impaired individuals is important to better their condition and maintain good mental health (Pedrelli, 2015). However, due to the lack of therapeutic and healing safe spaces in urban areas, psychological factors has become lethal leading to the decline of mental well-being among urban youths.

In summary, the decline in mental well-being among urban youths is caused by environmental, social, psychological and economic factors (see figure 2.1). A study by Abazzari et al. (2022) states that the built environment can alter human behaviour in an environment. Therefore, intervention through a built environment that tackles the four mental health factors is crucial to reduce mental health decline among urban youths. In line with this realisation, this research aims to rethink ways to reduce the factors leading to mental health decline among urban youths through space configuration, materiality, spatial layout, biophilic green spaces, colour psychology and architectural façade.

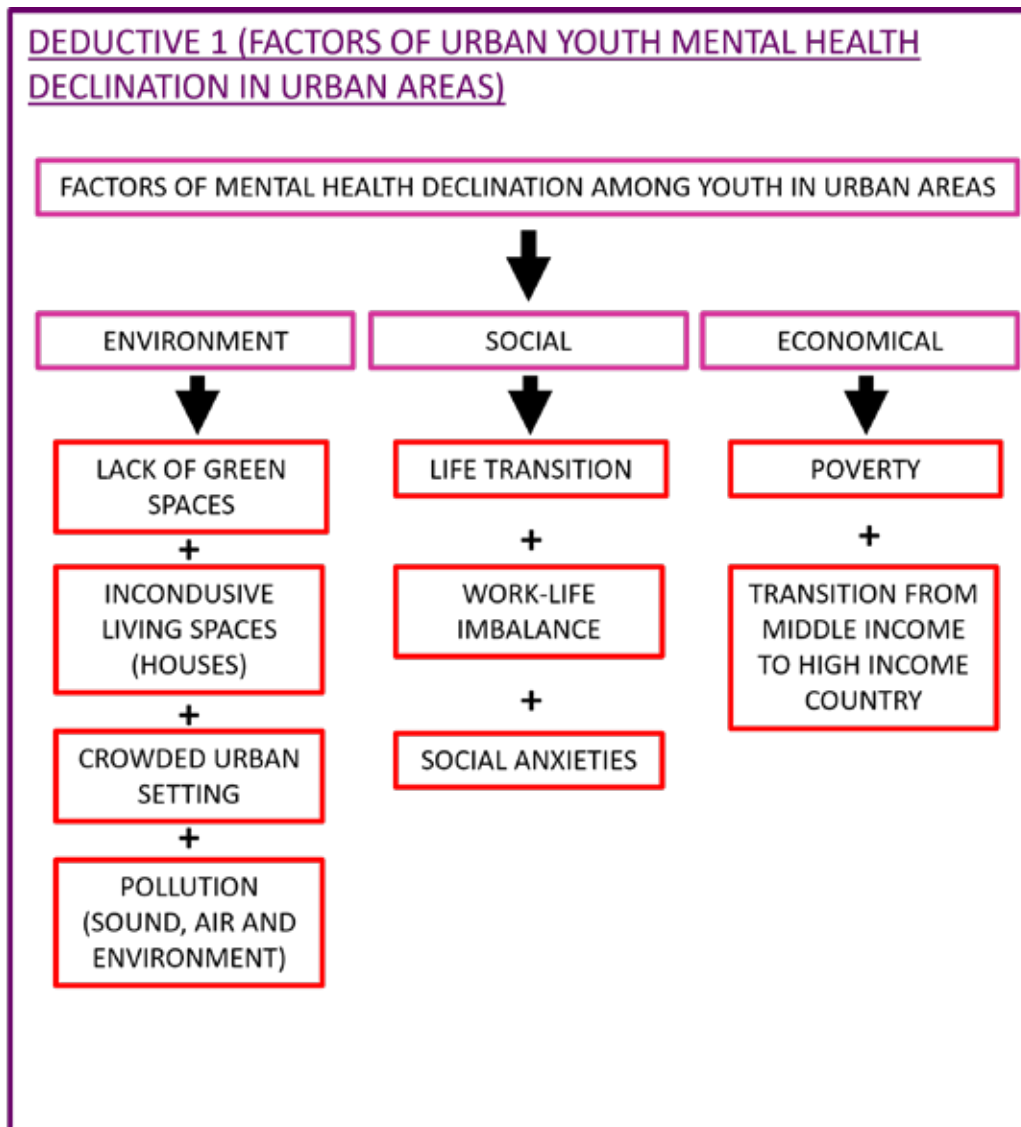


Figure 1.3 – Summary of factors of urban mental health decline among urban youths (Source: Author, 2023)

Other than that, healing and therapeutic architecture is a form of design strategy scientifically developed to foster building occupants' physical and mental well-being. It considers the human anatomy and architectural psychology to induce the human ability to self-heal (Chrysikou, 2014). Abazzari (2022) stated that the biophilic design approach is among the strategies to create therapeutic and healing architecture. It emphasises humans' need for a relationship with nature and its elements mainly outside a building like natural light, airflow and vegetation, (Abdelaal, 2019). Increasing human interaction with nature allows dopamine secretion in the brain that makes them

feel good and creates mental balance. According to a study conducted by Kellert (2015), the basic elements of biophilic design are as follows:

- Environmental features
- Natural shapes and forms
- Light and space
- Place-based relationships
- Evolved human-nature relationships

Supporting that, Pranita (2019), further emphasises that biophilic approach can be applied in building designs through components like operable windows, stack effect and long windows to allow natural lighting and air flow inside a building. Water bodies and vegetation inside a building can regulate the temperature and improve the mental well-being of building occupants.

In addition, the usage of natural materials is another design strategy therapeutic and healing architecture. Natural materials such as bricks, bamboo, timber, and adobe can improve human physical and mental well-being by invoking a calmer and tranquil feeling. Other than that, natural materials like timber can store carbon, remove air impurities and regulate indoor temperature, making it a healthier and greener option as a building material. Other materials like sand have a therapeutic value to it, soft to the touch, and gentle on feet. However, stone material is cool and smooth to touch but hard on feet. When the materials become integrated into the programme, the quality of the materials will embody the vision of the space and become another dimension in the healing environment, (Aditi, 2018)

Barron and Rugel (2022) clarified that the components of healing and therapeutic architecture include a balance between 'seclusion and retreat' and 'order and diversity' to create tolerant features toward resiliency in mental-wellbeing among urban youths. Therefore, a balance between built and natural environments in urban settings must co-exist to create a better urban landscape for urban youths. Dzhambov et al. (2018) highlighted that mechanisms underlying the association between green space and mental health should be further explored due to a significant relationship between urban green spaces and the healing and therapeutic effects that it brings to the mental well-being of urban youths. Many studies have reported the positive impact of green spaces around residential areas, large urban parks, blue spaces, and family gardens on mental health (Dennis & James 2017; Wood et al. 2017; Liu et al. 2021; McDougall et al. 2021). However, due to the city policy against densification, green space becomes a limited resource. Thus, Small Urban Green Space (SUGS) practiced in growing cities like Singapore helps alleviate this issue. SUGS help meet the daily outdoor needs of urban youths and has proven to reduce mental disorders among its youth since its implementation (Nutsford, Pearson & Kingham, 2013).

Other than that, space configuration and form are important design strategies of therapeutic and healing architecture. Pranita (2019) iterated that naturalistic shapes and forms can transform a static space into one that possesses living system's dynamic and ambient behaviour. Through the application of natural geometrics like the 'Golden Ratio' and the 'Fibonacci Sequence', a balance between architectural space and energy quality produced inside it can be achieved. She also added that, transitional space is crucial to connect the spaces, facilitate a clear directionality to move about in a building.

Lastly, sensorial components are also an architectural strategy of therapeutic and healing architecture. Naidu et al. (2022) revealed that humans have a dynamic relationship with the world around them. Consciously and subconsciously, the human body and the built environment interact. The human experience is shaped by how these senses engage with architecture. In addition, through a study by Naidu et al. (2022), the five senses can invoke therapeutic and healing architecture through:

- **Sight and architecture:** Buildings can only be understood via the use of the sense of light. Only the power of vision can make any architecturally built environment a success. This can be accomplished by employing materials and adding colour to various elements, angles and shapes.

- **Touch a building skin:** Buildings, as a palpable part of architecture, are all united physical form and architecture tactile. The structure is recalled by what we felt inside and what we touched, such as the floors, textured walls and wood grains. The choice of appropriate materials can create an emotional relationship between the building and humans that promotes healing
- **Smell in architecture:** Every scent has a place in human memories that is associate with something. Creating a distinctive smell can develop a full brand experience creating therapeutic and healing architecture.
- **Sound- an invisible architecture:** Without seeing, sound can help us comprehend the area, its purpose, and its components. The sound of nature like the crashing water and chirping birds can tranquilise human mind.
- **Taste in Architecture:** Touch creates a taste experience. Taste evolves oral sensation. A sense of taste has a story connection with buildings. Using different colours can make us recall the taste of character, depth and beauty of space.

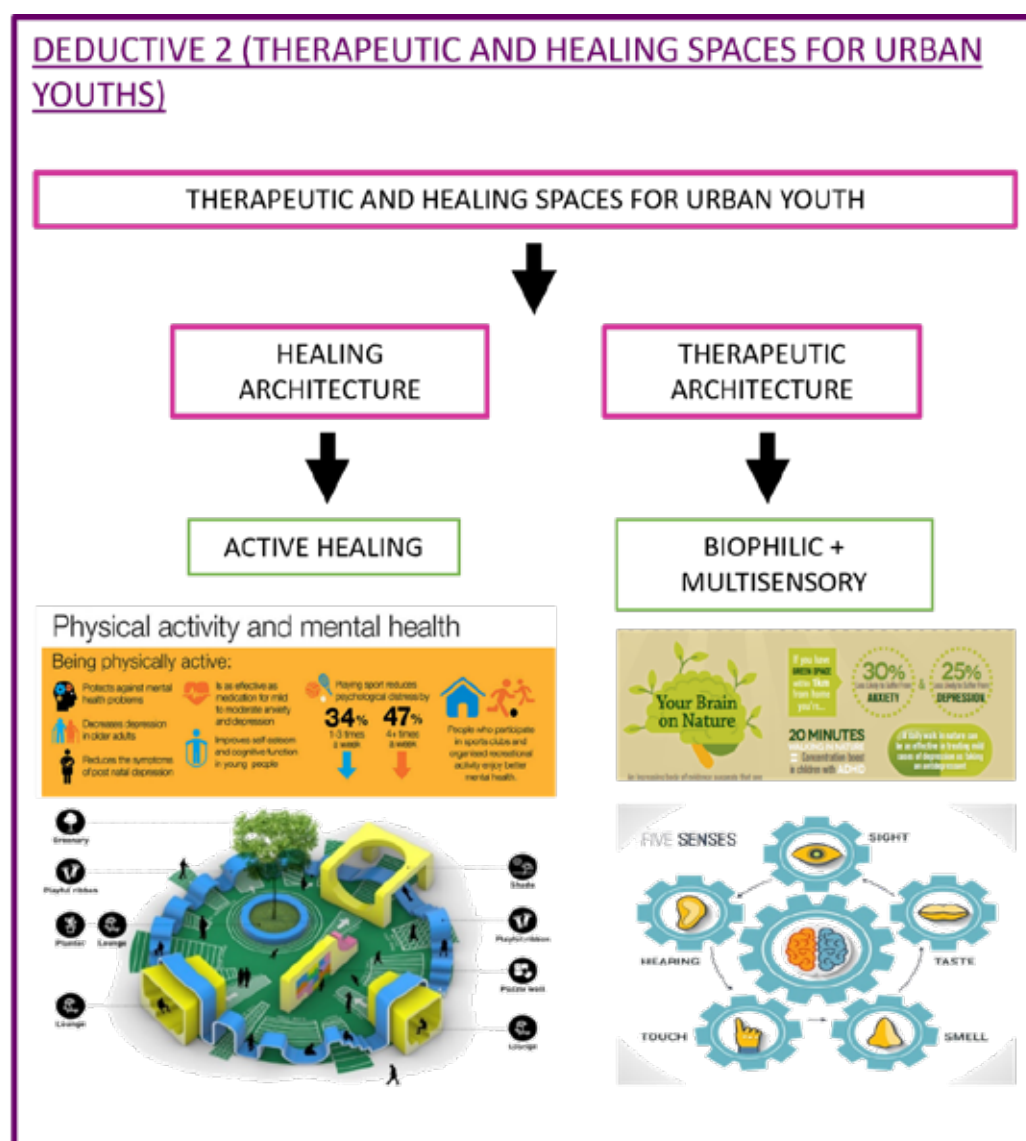


Figure 1.4- Summary of Therapeutic and Healing Architectural Design Strategies (Source: Author; 2023)

METHOD

This research utilizes the interpretive approach that specifically explore socially impactful issues like the mental well-being of urban youths through observation of selected groups in their natural setting for better understanding and interpretations of the causal effect to come up with viable solutions. It focuses on describing and interpreting people's feelings and experiences in a qualitative manner to explore the critical role of therapeutic and healing architectural concepts in mental health-aiding facilities to create a sustainable lifestyle among urban youths.

The literature review mention earlier provided a strong epistemological foundation for conducting a comprehensive or qualitative study to meet the research objective. Among the qualitative approaches that were used includes case study, archival analysis and interviews. These approaches were used to obtain an in-depth insights to the factors of mental health decline amongst urban youth and exploring the effects of therapeutic and healing architectural concepts on the mental-health of urban youths.

The study's target population were mentally ill urban youths, mental health experts and town planners. The selection criteria for mentally ill urban youths are as follows:

1. Urban Youths age 16-33 years old
2. Living in fast growing cities mostly in Ampang Jaya and Cheras
3. Suffers from level 1 (mild) to level 2 (moderate) severity of mental health issues

On the other hand, mental health experts are practicing psychologists and psychiatrists with experience in handling urban youth's cases. Their expertise was critical in comprehending environmental and psychological factors that affect mental-wellbeing to be translated in building design strategies. Town planners who are experts in urban sustainability were approached to get insights on applying therapeutic and healing strategies in urban settings as well as creating a sustainable urban realm for mentally-ill urban youths. Association representatives were also approached to get an overview of mental health aiding facilities available in Malaysian cities nowadays and gaps within those facilities. The selection of respondents were critically picked to ensure validity and reliability of the data gathered through these research interviews.

All the respondents followed a pre-determined interview protocol to ensure standardized and consistent data for analysis. The questions asked during the interview were made to address the two sub-research questions, RQ1 and RQ2 derived from the main research question (RQ) that can be referred to in Table 3.1.

The data gathered from the interview were then analysed using thematic analysis using the analysis matrix; a commonly used method to organize and analyse qualitative data in a research. It comprises a table that systematically shows the participants and case study as well as the coding and key themes emerging from the gathered data. Therefore, the coding and categorization of the data enables identification of patterns and relationships between the transcribed interviews from the participants and case studies.

Consents of the interviewees were gained to record and verbatim transcribe the interview session. The recording and interview transcripts were thoroughly reviewed to increase the study reliability and relevant excerpts were coded based on emerging themes and categories. To draw a meaningful conclusions, the coded data were organized and analysed to come up with significant findings from the interview. Among ethical considerations that were looked into in conducting this research includes voluntary participation. All respondents voluntarily participate in the study before any interview was conducted. Consents were gained to record and transcribe the data gained through the interviews. The principle of anonymity and confidentiality were also put first in conducting the study. Interviewees name were kept private and replaced with pseudonym to honour their privacy. The data gathered from the interviews was analysed through tabling, fact checking and comparing of the raw data to refine the study. Then, all the data will be validated with the 4-step validation which are the construct validity, Internal Validity, external Validity and its reliability. Finally, a new theory and solutions can be constructed.

Case study analysis was also conducted to gain secondary data and information from similar projects with similar attributes. This study conducted a comparative analysis of local and international mental health-aiding facilities to find out attributes that promotes mental well-being. The main purpose of case study analysis is to further analyse the success therapeutic and healing architectural concepts in mental health-aiding facilities. Six case studies (three international and three local) projects were selected for the study. Site visits were conducted to analyse the local facilities while desk reviews of secondary data from the web and scholar papers were conducted for the international projects. The selected case studies are listed in Table 1.1

Table 2.1- Secondary Data Analysis (Case Study) (Source: Author, 2023)

Case Study	Location
Hospital Universiti Kebangsaan Malaysia Psychiatric Unit	Cheras, Selangor
MENTARI Malaysia (semi-government mental health aiding facility)	Selayang, Selangor
Befriender's Malaysia (NGO's)	Petaling Jaya, Selangor
Bandung Psychiatric Rehabilitation Center	Bandung, Indonesia
Mental health center Berlin	Berlin, Germany
Vejle Psychiatric Hospital	Vejle, Denmark

RESULT AND DISCUSSION

This section analyses the response from interviewees through data tabulation and coming up with deductive codes. To conclude the final theme, the common characteristics was identified through the deductive codes. Thereafter, the thematic analysis matrix will be formulated.

Through the thematic analysis method, the data were broken down into deductive codes, themes and coding to come up with the final theme. From sub-research question 1, two themes were derived to know the urban issues and factors of urban youths' mental health decline. To answer sub-research question 1 which is the factors of urban youths' mental-health decline in urban areas, three themes were derived including:-

- Theme 1- Urbanization and Environmental Factors

From the interviews there are several core issues mentioned by the professionals including rapid urban development that causes stress among urban youths

“Rapid urban development can result in increased stress, disruption of social networks, and loss of community cohesion. The fast pace of urbanization may lead to feelings of disorientation and a sense of being disconnected from one's surroundings” (Urban Planner (T1), 2023).

This suggested that rapid urban development causes a swift growth and transformation of urban areas, often characterized by extensive construction, infrastructure development, and population increase. This process can have significant implications for the mental health of urban youths including increased stress. Rapid urban development brings about various stressors. The constant construction, noise, traffic congestion, and disruptions to daily life can contribute to heightened stress levels among urban youths. The fast pace of change and the pressure to adapt to new environments and circumstances can also be overwhelming, leading to increased stress and anxiety.

“Rapid Urbanization will abruptly take away social spaces and gathering spaces available in the urban areas. This will cause disruption of social networks that links urban youth with each other creating social gaps amongst them.” (Clinical Psychologist (D2), 2023)

Therefore, it is concluded that urban development involves demolishing existing structures, displacing communities, or altering the layout of neighbourhoods. These changes can disrupt social networks and connections that individuals have built over time. For urban youths, this can mean being uprooted from familiar social circles, schools, and support systems, leading to a sense of loss, social isolation, and difficulty in forming new relationships. This will result in the loss of community cohesion and a decline in the sense of belonging. As neighbourhoods undergo rapid changes, established community ties and shared identities can erode. This loss of social

cohesion can contribute to feelings of alienation and detachment from the community, which in turn may negatively impact mental well-being. The speed and scale of urbanization can create a sense of disorientation and disconnection among urban youths. New buildings, infrastructure, and urban layouts may not align with their previous experiences and mental maps of the city. This disconnection from familiar surroundings can lead to feelings of confusion, disorientation, and a sense of being out of place, which can impact mental well-being. In addition, rapid urban development often leads to fragmented urban spaces, characterized by disjointed neighbourhoods, lack of connectivity, and a loss of walkability. This fragmentation can hinder social interactions, community engagement, and access to amenities and services. It can contribute to a sense of physical and social disconnection, limiting opportunities for meaningful social participation and engagement.

“Urban environments often entail living in tight spaces, such as high-rise apartments or densely populated neighbourhoods. This can lead to a sense of confinement, reduced privacy, and limited personal space, which may contribute to feelings of stress and anxiety. Not to mention, the scarcity of green spaces and limited access to nature in urban areas can have a negative impact on mental well-being. The lack of breathing spaces, such as parks or gardens, reduces opportunities for relaxation, physical activity, and contact with natural environments.” (General Psychiatrist (D1), 2023).

The interview result also suggested that urban areas often involves residing in tight spaces such as high-rise apartments or densely populated neighbourhoods. These confined living conditions can lead to a sense of confinement, reduced privacy, and limited personal space. The lack of physical space can create feelings of crowding and restricted mobility, which may contribute to stress and anxiety. Living in tight spaces can also affect social dynamics and relationships. The close proximity of neighbours and limited privacy can impact social interactions and increase the likelihood of intrusions on personal space. This can result in a heightened sense of social pressure, discomfort, and decreased feelings of control over one’s environment. Studies have shown that high-density living and perceived crowding are associated with increased psychological distress and diminished well-being

In addition, urban setting often face challenges in providing adequate green spaces and access to nature. Green spaces, such as parks, gardens, and natural landscapes, offer opportunities for relaxation, physical activity, and contact with natural environments. These spaces have been shown to have positive effects on mental well-being, including stress reduction, improved mood, and enhanced cognitive functioning however, the scarcity of such breathing spaces in urban environments can deprive urban youths of these benefits. Limited access to green spaces restricts opportunities for relaxation and restoration, which are essential for managing stress and promoting mental well-being. Without access to nature, urban youths may experience a disconnection from natural elements and the restorative experiences they offer. This disconnection from nature has been associated with increased levels of psychological distress and reduced well-being. Thus, the lack of breathing spaces in urban areas can contribute to elevated stress levels, reduced resilience, and diminished mental well-being among urban youths.

“Poor air quality, noise pollution, and exposure to environmental hazards in urban settings can have detrimental effects on mental health. Living in areas with high levels of pollution or environmental degradation may increase the risk of mental health issues.” (General Psychiatrist (D1), 2023).

The interview result suggested that urban areas often encounter issues related to air pollution, stemming from factors like vehicle emissions, industrial activities, and inadequate waste management. Exposure to high levels of air pollutants, such as particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide (NO₂), and ozone (O₃), has been associated with various negative mental health outcomes. Research has indicated links between poor air quality and an increased risk of anxiety, depression, cognitive decline, and neurodevelopmental disorders among urban residents. Inhaling pollutants can trigger inflammation and oxidative stress in the body, affecting the balance of neurotransmitters and neural functioning, thereby contributing to mental health problems.

Other than that, urban environments are characterized by elevated noise levels due to factors like traffic, construction, and dense populations. Prolonged exposure to excessive noise can have detrimental effects on mental well-being. Chronic exposure to noise pollution has been connected to heightened stress levels, annoyance, sleep disturbances, and impaired cognitive performance. These factors can lead to increased psychological distress and negatively impact the mental health of urban youths. It also subject residents, particularly those in disadvantaged neighbourhoods, to various environmental hazards. These hazards may include proximity to industrial sites, contaminated soil or water, waste disposal facilities, or other sources of environmental toxicity. Residing in environments with heightened exposure to such hazards can contribute to increased stress, anxiety, and a higher risk of mental health issues. The fear and uncertainty associated with living near these hazards can further intensify mental distress among urban youths.

“Overcrowding is a common issue in urban areas, where there is a high concentration of people in limited spaces. Overcrowded living conditions can lead to a lack of privacy, increased noise levels, and difficulties in establishing personal boundaries. These conditions can contribute to feelings of stress, irritability, and reduced mental well-being among urban youths.” (MENTARI Malaysia (A2), 2023)

The interview results suggested that in-conducive living spaces often lack the necessary room for individuals to feel comfortable and have their own personal space. Cramped or overcrowded living conditions can lead to a constant sense of being confined, resulting in feelings of restlessness and frustration. The lack of privacy can also be a significant stressor, as individuals may not have a place to retreat and relax, which can contribute to increased anxiety and decreased overall well-being. In urban areas where green spaces and recreational facilities are scarce, individuals may struggle to find areas for relaxation and physical activity. The absence of nearby parks or gardens deprives urban youths of spaces where they can unwind, engage in leisure activities, and connect with nature. The lack of access to these spaces can lead to heightened stress levels and a reduced ability to cope with the demands of urban life. In addition, living in in-conducive spaces can impact emotional well-being. The physical environment has a direct influence on mood and emotional states. Poor lighting, inadequate ventilation, and dilapidated conditions can create an atmosphere that is depressing and oppressive. These conditions can contribute to feelings of sadness, irritability, and dissatisfaction, negatively impacting mental health.

- Theme 2 – Socioeconomic Challenges

“Urban areas often concentrate poverty and socioeconomic inequalities. Living in poverty can have profound effects on mental health, including increased stress, limited access to resources and opportunities, and a higher risk of experiencing mental health disorders.” (General Psychiatrist (D1), 2023).

Unemployment poses significant risks to the mental well-being of young people in urban areas. The scarcity of job opportunities and economic hardships contribute to feelings of hopelessness, low self-esteem, and heightened levels of stress and anxiety. Unemployment disrupts their sense of purpose, social connections, and financial stability, increasing the likelihood of mental health problems. Prolonged unemployment can erode self-confidence, intensify feelings of despair and isolation, and exacerbate the risk of mental health issues.

Supporting the statement the Clinical Psychologist (D2) (2023) iterated that urban areas often concentrate poverty and socioeconomic inequalities. Living in poverty can have profound effects on mental health, including increased stress, limited access to resources and opportunities, and a higher risk of experiencing mental health disorders. Poverty can create a cycle of disadvantage, affecting various aspects of life, including housing, education, healthcare, and social support. The financial strain and social exclusion associated with poverty can lead to feelings of powerlessness, shame, and depression.

The interview with Befriender’s Malaysia (A1) (2023), also suggested that exposure to urban crime, including violence, theft, or drug-related activities, can significantly impact the mental well-being of urban youths. The fear of crime and the need to navigate unsafe environments can lead to heightened stress, anxiety, and hyper vigilance. Urban crime can create a sense of

vulnerability and impact the daily lives of young people, limiting their freedom of movement and participation in community activities. Witnessing or being a victim of crime can result in trauma and psychological distress, further exacerbating mental health problems.

These elements highlight the socioeconomic challenges faced by urban youths and their impact on mental well-being. Addressing these challenges requires comprehensive approaches that focus on promoting economic opportunities, reducing crime rates, and addressing poverty and inequality. Creating supportive environments that provide access to resources, opportunities for employment, and social support networks can contribute to improved mental health outcomes for urban youths.

- Theme 3- Psychological and Social Factors

“Being a victim of bullying can contribute to the development of social anxieties among urban youths. Persistent bullying experiences, whether in schools, neighbourhoods, or online platforms, can cause emotional distress, erode self-esteem, and generate feelings of anxiety and fear” (Clinical Psychologist (D2), 2023).

The interview suggested that being a victim of bullying can contribute to the development of social anxieties among urban youths. Persistent bullying experiences, whether in schools, neighbourhoods, or online platforms, can cause emotional distress, erode self-esteem, and generate feelings of anxiety and fear. The negative interactions and harassment associated with bullying can lead to heightened social anxieties, making it difficult for young individuals to engage in social interactions without feelings of pressure, isolation, and discomfort. Other than that, urban environments can contribute to the manifestation of both bullying and social anxieties. The fast-paced lifestyle, crowded public spaces, and high social expectations prevalent in urban areas can create an environment that increases the likelihood of bullying behaviours. The density and diversity of urban populations can intensify social pressures and competition, which may contribute to the occurrence of bullying. Simultaneously, these factors can also lead to increased social anxieties among urban youths, as they navigate a dynamic and demanding social landscape. Both bullying and social anxieties have detrimental effects on the mental well-being of urban youths. Bullying experiences can result in emotional distress, low self-esteem, and anxiety, which can persist long-term and impact overall mental health and well-being. Similarly, social anxieties arising from urban environments can contribute to increased stress levels and difficulties in forming and maintaining relationships, which further impact mental well-being. The combination of bullying and social anxieties can create a cycle that perpetuates mental health challenges among urban youths.

“Urban youths often face significant mental health challenges due to familial problems and exposure to traumatic events. Family-related issues, including conflicts, dysfunction, and neglect, or abuse, can have a profound impact on their well-being. High-stress family environments, unstable family structures, or a lack of emotional support can contribute to an increased risk of mental health problems among young people in urban areas. Growing up in such environments can evoke feelings of insecurity, anxiety, and depression” (General Psychiatrist (D1), 2023).

The interview results also concludes that one of the most significant factor of mental health decline among urban youths is traumatic life events. The urban environments may have a higher likelihood of experiencing traumatic incidents. Exposure to violence, accidents, or natural disasters can deeply affect the mental health of urban youths. Traumatic events can lead to the development of mental health disorders such as post-traumatic stress disorder (PTSD), anxiety, depression, and other difficulties. The aftermath of trauma can have long-lasting effects, disrupting their sense of safety, trust, and overall well-being. The combination of familial problems and traumatic experiences creates a complex and challenging environment for urban youths. These factors interact and mutually reinforce each other, increasing the vulnerability to mental health issues. Familial problems can contribute to the risk of experiencing traumatic events, and trauma can exacerbate the impact of familial problems on mental health.

“Genetic factors and hereditary predispositions can contribute to the mental health decline observed among urban youths. Certain mental health conditions, such as

depression, anxiety disorders, or bipolar disorder, can have a genetic component. Urban youths who have a family history of these mental health issues may be at a higher risk of experiencing similar challenges themselves” (General Psychiatrist (D1), 2023).

Genetic predispositions refer to the increased likelihood of developing certain mental health conditions due to inherited genes. While genetics alone do not determine mental health outcomes, they can influence susceptibility to certain disorders. Urban youths with a family history of mental health issues may inherit genetic variations that increase their vulnerability to specific conditions. In urban areas, the combination of genetic predispositions and environmental factors can influence mental health outcomes. Urban environments often present unique stressors and challenges that can interact with genetic factors to impact mental well-being. Factors such as high population density, social pressures, limited resources, and exposure to adverse experiences can further exacerbate the risk of mental health problems among individuals with hereditary predispositions. It is important to note that while genetic factors play a role in mental health, they do not operate in isolation. Environmental factors, including urban stressors and experiences, also significantly contribute to mental health outcomes. The interplay between genetics and the environment is complex and multifaceted, with both factors influencing each other and impacting overall mental well-being.

To answer sub-research question 2 which is therapeutic and healing architectural concepts that can help improve the mental health of urban youths in rapidly growing cities, four themes were derived including:-

- Theme 4- Environmental Design and Connection with Nature

The interview results emphasize a few key concepts that contribute to therapeutic and healing environment to improve mental health of urban youths. One of the interviews emphasize the importance of biophilic concept as a mode to create therapeutic and healing environment in mental-health aiding facilities to improve mental health of urban youths.

“An architectural concept that creates therapeutic and healing environment includes incorporating biophilic elements in urban spaces. It can help create a more calming and restorative environment for urban youths.” (Urban Planner (T1), 2023).

This suggest that incorporating green spaces, such as parks, gardens, or rooftop gardens, into mental health-aiding facilities allows urban youths to connect with nature and find solace away from the bustling city. Spending time in green spaces has been associated with reduced stress levels, improved cognitive function, and enhanced emotional well-being. Maximizing access to natural light through large windows, skylights, and light wells in architectural design promotes better sleep patterns, mood regulation, and increased overall satisfaction with the indoor environment. Other than that, integrating indoor plants into built spaces not only improves air quality but also creates a visually appealing and soothing atmosphere, reducing stress and enhancing mental focus. Views of nature, even through windows or balconies, provides visual stimulation and opportunities for relaxation and contemplation. This is because biophilic designs aim to recreate the connection between humans and nature, offering urban youths the benefits of tranquillity, restoration, and well-being.

Other than that, the urban planner (T1) (2023), further elaborated that salutogenic concepts can create therapeutic and healing environment for urban youths. This concept is very suitable to be incorporated in mental health aiding facilities because it aim to enhance individuals’ sense of coherence, control, and meaningfulness in their environment, which are essential components of mental well-being. Incorporating natural light into the design of spaces can have a positive effect on mental well-being. Sunlight has been associated with improved mood, increased vitamin D synthesis, and regulation of circadian rhythms, which are important for sleep and overall health. Salutogenic designs prioritize the integration of natural light through the use of large windows, skylights, and light wells, creating a bright and uplifting atmosphere that supports mental well-being. It often include flexible spaces that allow for personalization and adaptation according to individual needs and preferences. Providing choices and opportunities for autonomy in how spaces

are used can contribute to a sense of control and empowerment. For urban youths, flexible spaces can enable them to create environments that suit their specific activities, interests, and social interactions, fostering a sense of ownership and well-being. Salutogenic designs encourage social interaction and community engagement by incorporating spaces that facilitate social connections and collaboration. These spaces can include communal areas, gathering spaces, or multipurpose rooms that promote socialization and the formation of supportive relationships. Enhancing social connections and community engagement is crucial for the mental health and well-being of urban youths, as it can foster a sense of belonging, reduce feelings of isolation, and provide opportunities for emotional support.

In addition, the clinical psychologist (D2) (2023), iterated that sensorial design can be very stimulating to urban youths' mind and should be incorporated in mental health-aiding facility. This is because sensorial design focuses on creating a stimulating and engaging environment by utilizing various sensory experiences. It involves the intentional integration of elements that appeal to the senses, such as lighting, acoustics, textures, and aromas. The aim is to enhance emotions, provide comfort, and optimize cognitive functioning. By considering sensory experiences, sensorial design aims to positively impact the mental well-being of urban youths, creating spaces that evoke emotional responses, ensure visual comfort, promote relaxation, and enhance concentration.

“Colour psychology is also a concept that should be explored because it can influence mood, emotions, and behaviour of urban youths in urban areas. Different colours evoke various psychological and physiological responses. Warm colours like red and orange may promote energy and enthusiasm, while cool colours like blue and green can create a sense of calm and relaxation.” (Clinical Psychologist (D2), 2023).

Through an architectural perspective, colour psychology will indeed have an impact on the well-being of the occupants. According to Urban Planner (T1) (2023), blue is often associated with feelings of calmness, tranquillity, and relaxation. It has a soothing effect on the mind and body, making it an ideal colour for spaces where individuals seek respite from the busy urban environment. Incorporating shades of blue in areas such as relaxation rooms, meditation spaces, or quiet corners can help create a serene and peaceful ambiance. Green is another colour that is often associated with nature, harmony, and balance. It is known to have a restorative effect on mental well-being. Integrating green elements, such as indoor plants or green walls, can help bring a sense of nature into urban spaces. This connection with nature can have a positive impact on reducing stress, enhancing mood, and promoting relaxation. Therefore, by understanding the psychological effects of different colours, urban designers and architects can make informed choices when selecting colour schemes for various spaces. By incorporating appropriate colours, they can create environments that enhance mood, reduce stress levels, and support positive psychological states. This attention to colour psychology in urban design can contribute to creating spaces that are not only visually appealing but also promote the mental well-being of urban youths.

- Theme 5- Physical Activity and Active Lifestyle

“The presence of active spaces and opportunities for physical activity encourages an active and healthy lifestyle among urban youths. Engaging in physical activities within these spaces can improve physical fitness, boost energy levels, and promote overall well-being” (Clinical Psychologist (D2), 2023).

This statement is supported by Befriender's Malaysia (A1) (2023), who emphasized that physical activity and an active lifestyle are crucial for maintaining good physical and mental health. Urban environments play a significant role in promoting physical activity among urban youths by providing active spaces and encouraging an active lifestyle. Active spaces which are designed within urban environments encourages physical activity, movement, and exercise. These spaces can include parks, sports facilities, recreational areas, walking and cycling paths, and outdoor exercise zones. By providing dedicated spaces for physical activities in mental health-aiding facilities, urban youths have opportunities to engage in various forms of exercise, such as running, jogging, playing sports, or participating in group fitness activities. These spaces often include amenities like exercise equipment, sports fields, and designated areas for specific activities. MIASA

Malaysia (A2) (2023), stated that promoting an active lifestyle goes beyond providing physical spaces. It involves creating an environment that encourages and supports regular physical activity as part of daily routines. This can include infrastructure that promotes active transportation, such as bike lanes and pedestrian-friendly streets, making it easier and safer for urban youths to walk or cycle. Additionally, urban planning that integrates amenities like fitness centers, community gyms, or swimming pools within close proximity to residential areas can further facilitate an active lifestyle.

Engaging in regular physical activity has numerous benefits for the mental health of urban youths. It helps reduce stress, improve mood, increase energy levels, and enhance cognitive function. Physical activity releases endorphins, which are natural mood-boosting chemicals in the brain, leading to feelings of happiness and well-being. Regular exercise also helps manage anxiety and depression symptoms, improves self-esteem, and enhances overall psychological well-being.

- Theme 6- Social Interaction and Community Engagement:

Befriender's Malaysia (A1) (2023), mentioned that social interaction and community engagement are essential for the well-being of urban youths. Urban environments can facilitate these aspects by providing interactive spaces and fostering a community-based approach.

Both general psychiatrist (D1) and clinical psychologist (D2) (2023), believes that interactive spaces which are designed within urban settings that promote social interaction, collaboration, and engagement among individuals. These spaces can include community centers, public gathering areas, recreational facilities, or interactive installations. The design of these spaces encourages people, including urban youths, to come together, interact, and participate in various activities. They may provide opportunities for group discussions, workshops, cultural events, or collaborative projects, fostering a sense of connection and shared experiences.

Adding on, MIASA Malaysia (A2) (2023), iterated that community-based approaches focus on building a sense of community and fostering social connections within urban neighbourhoods. They involve initiatives and programs that bring people together, encourage collaboration, and address local needs. This can include community-led events, volunteer activities, neighbourhood associations, or participatory planning processes. By involving urban youths in community-based initiatives, they can develop a sense of belonging, contribute to their community, and establish meaningful relationships with others.

Clinical Psychologist (D2) (2023), said that promoting social interaction and community engagement has several benefits for the mental health of urban youths. It helps combat feelings of isolation and loneliness by providing opportunities for social support and connection. Social interaction allows for the exchange of ideas, sharing of experiences, and learning from others, which can contribute to personal growth and development. Community engagement fosters a sense of belonging and identity, instilling a feeling of pride and ownership in one's neighbourhood or community. These initiatives promote social cohesion, build resilience, and enhance overall well-being. They provide opportunities for urban youths to connect with others, share experiences, and actively participate in shaping their community, leading to a sense of fulfilment and a stronger support network.

- Theme 7- Health and Well-Being

General Psychiatrist (D1) (2023), mentioned that health and well-being are important considerations in urban environments, and several concepts contribute to promoting and improving overall health outcomes. Designing urban spaces with a focus on reducing health issues involves creating environments that prioritize factors such as air quality, safety, and access to healthcare services. By addressing factors that contribute to poor health, such as pollution, hazardous environments, and limited healthcare resources, urban environments can help reduce health risks and improve the well-being of urban youths. For example, implementing policies and strategies to reduce air pollution, providing safe recreational areas, and ensuring access to mental healthcare facilities can contribute to a healthier urban population.

Adding on, Urban Planner (T1) (2023), emphasize that enhancing overall well-being is a key goal in urban design. Urban spaces can be designed to support mental and emotional well-being by incorporating elements such as green spaces, recreational areas, and amenities that promote relaxation and stress reduction. Access to nature, opportunities for physical activity, and creating aesthetically pleasing environments can positively impact mental health, reduce stress levels, and enhance overall well-being among urban youths. This will lead to a sustainable lifestyle among urban youths. It focuses on promoting environmentally friendly practices that support the well-being of individuals and the planet. Designing cities with a focus on sustainability involves strategies such as energy efficiency, waste reduction and recycling, sustainable transportation options, and green infrastructure. By creating sustainable urban environments, we can improve air and water quality, mitigate climate change impacts, and create healthier, more liveable cities for better mental health among urban youths and future generations. This approach recognizes the interconnectedness of physical, mental, and environmental health and strives to create urban environments that support the holistic well-being of individuals and the communities they inhabit.

All in all, the professionals interviewed agreed that the combination of these architectural concepts creates environments that support overall well-being. The calming ambience, active lifestyle opportunities, community connections, reduced health issues, and sustainable practices collectively contribute to improved mental, physical, and social well-being among urban youths.

Thematic analysis

Main Research Question: What are the design factors for therapeutic and healing architecture in rapidly growing cities to improve the mental health of urban youths? Aim of Research: To contrive a design framework for healing and therapeutic mental health-aiding facilities Research Inquiry: Phenomenological Study Informants: Five mentally ill urban youths, two mental health experts, one town planner and two mental health associations representatives					
Research Question	Deductive codes	Strategy of Inquiry	Inductive codes	Category	Final Theme
Sub RQ1: What are the issues in urban areas that lead to the declining mental health of urban youths?	DC 1.1 : Issues in urban areas	-Desk Review -Expert Interviews	Issues: Rapid Development Reduced Breathing Spaces Tight Spaces Flood Prone Degraded Environment Quality Overcrowding Unemployment Urban Crime Poverty	Category 1: Urban Landscape Category 2: Environment Category 3: Economics Category 4: Social Category 5: Psychological	Theme 1: Urbanization and Environmental Factors Theme 2: Socioeconomic Challenges Theme 3: Psychological and Social Factors
	DC1.2: Factors of urban youths' mental-health decline	-Desk Review -Expert Interviews	Factors: Social Anxieties Bullying In-conducive Living Spaces Familial Problems Hereditary Trauma		
Sub RQ2 : What are the therapeutic and healing architectural concepts that can help improve the mental health of urban youths in rapidly growing cities?	DC 2.1: Therapeutic and healing architectural concepts	-Desk Review -Expert Interviews	Architectural Concepts: Biophilic Designs Salutogenic Designs Sensorial Design Colour Psychology Active Spaces Interactive Spaces	Category 6: Nature Induced Category 7: Active and Interactive Category 7: Community Engagement Category 8: Enhanced Health	Theme 4: Environmental Design and Connection with Nature Theme 5 : Physical Activity and Active Lifestyle Theme 6 : Social Interaction and Community Engagement: Theme 7: Health and Well-being
	DC 2.2: Improving mental health of urban youths	-Desk Review -Expert Interviews	Improvements: Calming & Serene Ambience Active Lifestyle Community-Based Reduced Health Issues Sustainable Lifestyle Improved Well-being		

Table 3.5- Thematic Analysis Matrix (Source: Author, 2023)

Case Study Analysis



Figure 3.1-*Psychiatric Unit HUKM Entrance*



Figure 3.2-*Psychiatric Unit HUKM Hallway*

The spatial planning of the three local case study were analysed to compare its configuration. It is found out that spatial planning in HUKM psychiatric unit is very rigid and dull. The ambience in the hospital is very gloomy without natural features to create a calming feeling for mentally-ill urban youths. The building design is also enclosed with no openings that allow indoor-outdoor amalgamation to evoke therapeutic and healing feelings for patients. The rigid configuration can be seen in figure3.3.

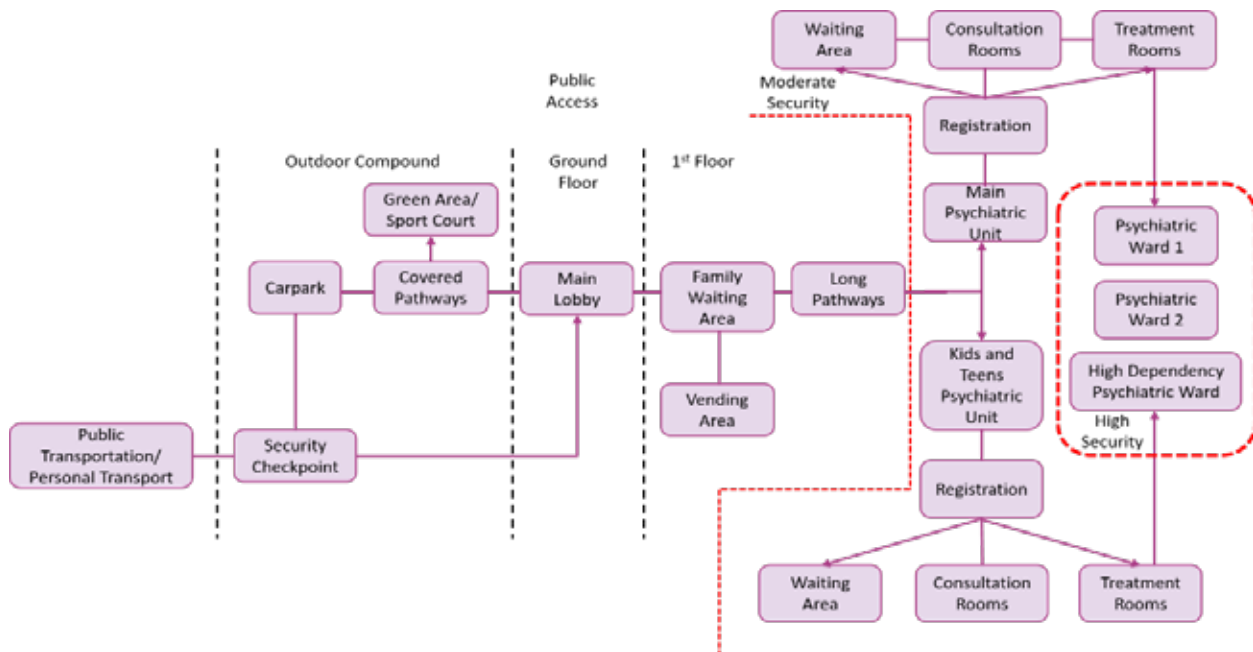


Figure 3.3- Spatial Configuration HUKM Psychiatric unit (Source: Author, 2023)

MENTARI Malaysia is a semi government agency that focuses on giving help to mentally-ill individuals. Currently the center is located in Kompleks Selayang Capitol that the government rented. The three shop lots spaces have no architectural qualities that can evoke therapeutic and healing environment. MENTARI representative also emphasize that due to the space constraints, all community programs are hosted in the treatment rooms or third party venues. The spaces are also not conducive for patients because it is directly converted from shop lot spaces. Due to this, not many mentally-ill urban youths come to seek help and from MENTARI. The space configuration are also rigid and can be seen from the analysis in figure 3.4.

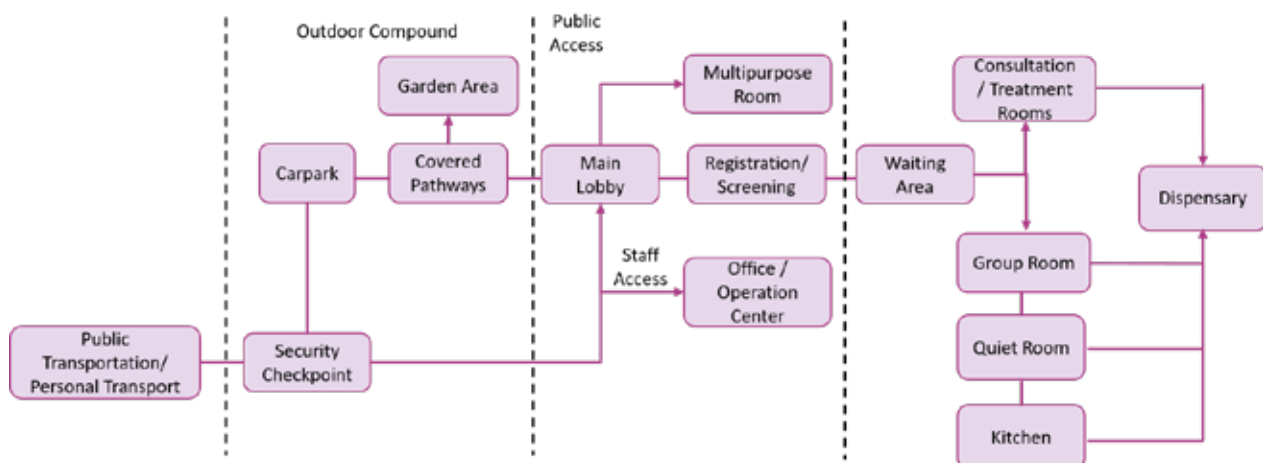


Figure 3.4- Spatial Configuration MENTARI Malaysia (Source: Author, 2023)

Befriender's Malaysia utilizes an old single storey bungalow house for its operation. The spaces in Befriender's Malaysia has no therapeutic and healing architectural strategies imbedded in them. However, they created a homely ambience that makes patients feel belonged. The space configuration is also very relaxed and deinstitutionalized. The space configuration can be seen in figure 3.5.

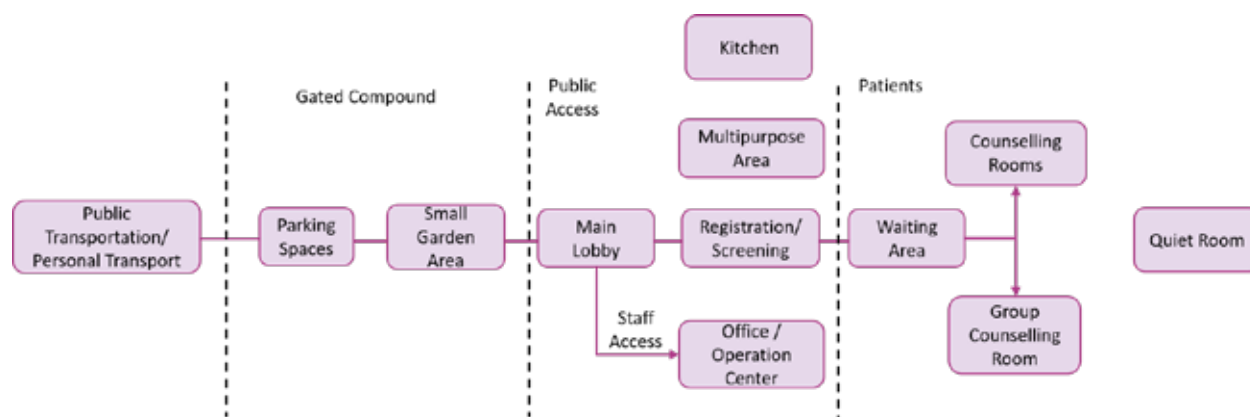


Figure 3.5- Spatial Configuration Befriender's Malaysia (Source: Author, 2023)

Based on several criteria of inducing therapeutic and healing architectural concepts in mental health-aiding facilities, the summary of the design analysis is shown in table 4.5 below.

Table 3.6- Case Study Analysis (Secondary Data) (Source: Author, 2023)

	Bandung Psychiatric Rehabilitation Center, Indonesia	Velje Psychiatric Hospital, Denmark	Mental Health Center Berlin, Germany
Typology	Hospital	Hospital	Mental Health-Aiding Facilities
Therapeutic and Healing Strategies	-Courtyards -Open Green Spaces - Water Feature - Cascading Garden for Community Engagement	-Mini Courtyards -Light Healing Effect -Natural Lighting -Diminished Indoor and Outdoor Boundaries	-Courtyards -Green roofs -Flow with Nature -Green and nature therapy strategies -Water features -Colour psychology
Benefits of Therapeutic and Healing Strategies Implementation	- Accelerate the healing process of its users - Coherent and clear safe spaces - warmth and home-like experience for the users	-Decrease in physical restraint among mental health patients - encourages physical activity and minimalizes forceful intervention	- Friendly and engaging space for mental health patients -Regenerative environment based on biophilic design

CONCLUSION

In conclusion, this research focuses on contriving a design framework for therapeutic and healing architectural concepts in mental health-aiding facilities to foster better mental health amongst urban youth in rapidly growing cities. It addresses the issues in urban areas and identified the factors causing mental health decline amongst urban youth. The relations between the two helps to address the issues in urban areas to reduce the decline of urban youths' mental well-being.

Through the interviews, observation and case studies, this research provided valuable insights to the plausible architectural concepts to be adopted to create therapeutic and healing environments for urban youths in rapidly growing cities. The benefits and improvements in urban youths' lifestyle were also identified through the adaptation of therapeutic and healing architectural concepts.

The research findings revealed several significant challenges in adapting therapeutic and healing architectural concepts in urban areas such as space limitation and cost. However, through adapting some of the strategies like Small Urban Green Spaces (SUGS), the challenges can be avoided. The enforcement of institutionalization due to mental health stigma in mental health-aiding facilities also goes against the principle of therapeutic and healing architectural concepts. Therefore, to defy the stigma, developing positive attitudes and formation of habits can be achieved through creating

transparency in mental-health aiding facility can help improve public perception. Programs such as public awareness and inclusive activities can further reduce social stigma associated to mental health.

The prototype of therapeutic and healing architecture for mental health aiding facilities focusing on urban youth generated can be used for further research and references to the government, government-linked companies (GLC's), and non-governmental bodies (NGO's). The guidelines will include suggested space configuration, design concepts, building design and orientations, building interaction with natural elements, choices of materials and façade treatment. By having this study, urban youth will have a safe haven that could help manage their mental health issues without the stigma of institutionalization. Other than that, the government and mental health GLC's and NGO's will have a model center they could liaise with pertaining mental health issues. Additionally, increase social relevance and adding valuation, as well as positive perception to the public about mental health.

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious, Most Merciful. All praise is to Allah, The Lord of the heavens and earth. First and foremost, I would like to express my utmost gratitude to my dissertation supervisor, Assoc. Prof. Dr. Zalina binti Shari for her patience, guidance and motivation throughout the research process. It was such an honour to be working on this research topic under her supervision. Her immense knowledge and experience in sustainability, therapeutic and healing architecture have led to fruitful research that can benefit many parties.

Other than that, I am grateful to my subject coordinator, Assoc. Prof. Dr. Mohd. Zairul bin Mohd Noor for sharing his knowledge on research methods and dissertation writing. It aided me immensely in completing this research. I also am extending my appreciation to all my interviewees who gave their professional opinions, support and understanding throughout the interview. An honourable mention goes to my parents who guided and supported me both physically and emotionally throughout my studies. Finally, I would also like to thank all the people who helped supported me and stood by me to complete the research work directly or indirectly.

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THERAPEUTIC RELATIONSHIP OF SALUTOGENIC AND PLAYSCAPE ARCHITECTURE: A SUICIDE INTERVENTION WITHIN SARAWAK YOUTH COMMUNITY

Nurul Amirah Marzuki, Mohd Zairul Mohd Noor

ABSTRACT

The Sarawak Government is concerned about the increasing youth suicide rates in the region and has called for more studies on the issue. The Ministry of Health has reported that the number of youth with mental health issues leading to suicide has risen, although exact figures were not given. In Malaysia, the suicide rate among youths aged 13 to 17 is 7.9 per 100,000 population, higher than the global average. While the suicide rate in Sarawak specifically is unknown, it is a growing concern. The lack of youth facilities and programmes to address this issue, particularly in safe environments and resilient architecture, highlights the need for research and intervention in this area. Therefore, the goal is to gain insight into how salutogenic and playscape architecture can affect youth mental health in Sarawak, detect undiagnosed mental health issues, and reduce the risk of future mental illness and suicide through architectural explorations. This research will benefit stakeholders in building a better quality of life for Sarawak's youth community, and the results will be produced in a tangible output from the study.

Keywords: Salutogenic; Playscape; Architecture; Mental Health; Youth

INTRODUCTION

This paper provides an abridged version of the dissertation, offering an overview of the research's background, purpose, contributions, findings, and practical implications. It focuses on investigating the impact of architectural design on youth mental health, particularly addressing challenges in existing spaces and enhancing well-being through architectural elements. The research serves to enrich both theoretical and practical aspects of youth mental health and architectural design. It is motivated by the recognition of the pivotal role the built environment plays in shaping the well-being and experiences of young individuals seeking mental health support. Current spaces often pose challenges that hinder the effectiveness of mental health interventions, including the absence of a homely atmosphere, insufficient safety measures, and a lack of a sense of belonging. Furthermore, the potential of architectural elements to improve well-being and prevent youth suicide remains largely unexplored.

Through an extensive literature review, incorporation of theoretical foundations, and analysis of qualitative data, this study aims to address gaps in current research. The literature review encompasses reputable international journals, nationally recognized journals, international and national symposiums, textbooks, and respected daily publications. The research is firmly grounded in current knowledge, focusing on the most recent decade of published literature. Hypotheses are formulated based on theory, previous research, and logical reasoning. For hypothesis testing research, formulated hypotheses are presented as follows:

H1: The implementation of design strategies that address challenges in current youth mental health spaces and enhance well-being through architectural elements will positively influence the mental well-being, sense of belonging, and engagement of young individuals. This will lead to a reduction in suicide risks and promote overall positive outcomes in youth mental health.

For qualitative research without hypothesis testing, the literature review section presents a comprehensive overview of relevant theories, previous research, and arguments related to the research focus. The research focus is presented in the form of questions, exploring the design strategies and elements that can enhance youth well-being and prevent suicide. The contribution

of this research lies in the identification and analysis of design challenges in current youth mental health spaces and the proposal of design strategies to enhance well-being through architectural elements. The practical implications of the study offer advice and recommendations based on the research results, aiming to inform architects, designers, and mental health professionals in creating supportive and effective environments for young individuals.

This dissertation conference paper addresses the research background, purpose, contributions, research results, and practical implications concerning the impact of architectural design on youth mental health. By exploring the challenges in current spaces and proposing design strategies for enhancing well-being, this research contributes to the advancement of both theory and practice in the field. Subsequent sections will delve into detailed findings and discussions, providing valuable insights for future research and practical applications. This dissertation conference paper addresses the research background, purpose, contributions, research results, and practical implications related to the impact of architectural design on youth mental health. By exploring the challenges in current spaces and proposing design strategies for enhancing well-being, this research contributes to the advancement of both theory and practice in the field. The following sections will delve into the detailed findings and discussions, providing valuable insights for future research and practical applications.

Background Study:



Diagram 1.2.1 (A) Shows the numbers of youth population in Sarawak based on Sarawak Youth ministry data.

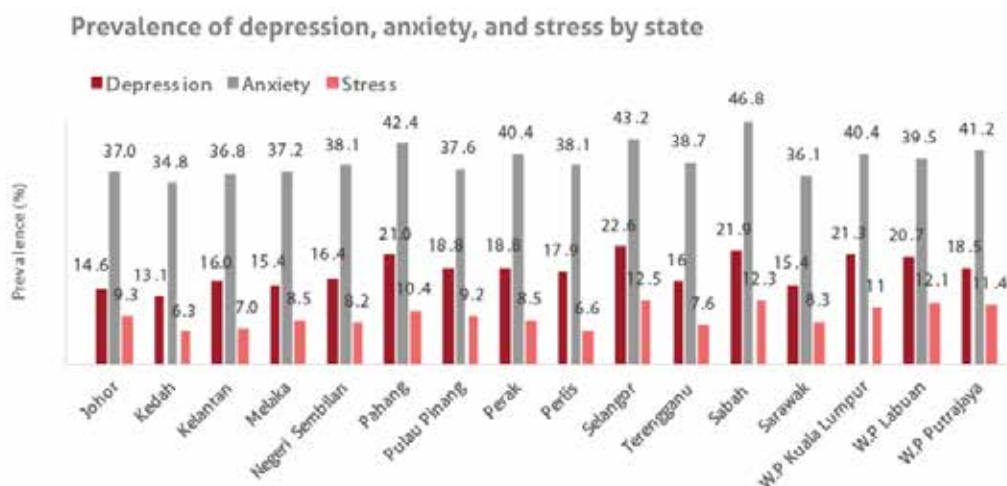


Diagram 1.2.1 (B) shows the prevalence study of depression, anxiety and stress by state in Malaysia according to National Health Morbidity study.



Diagram 1.3.2.1 shows Sarawak State government's concern about current rising youth mental health issues and suicide cases.

Mental illness is a growing concern among young people globally, including in Sarawak, Malaysia, where limited data on prevalence hinders understanding the extent of the problem. Undiagnosed and untreated mental illness among youth can lead to severe consequences, such as an increased risk of suicide. Architectural interventions, specifically salutogenic and Playscape designs in community play centers, have the potential to create supportive environments and reduce youth suicide risk. However, these interventions must be complemented by a comprehensive mental health strategy that addresses the underlying causes of mental illness and ensures access to diagnosis and treatment. The high youth population in Sarawak highlights the need to prioritize mental health issues in this region.

Issues, Underlying Causes, and Intervention: Sarawak has a significant youth population, representing 43.5% of Malaysia's total youth population. However, mental health issues among young people in Sarawak are underreported due to cultural norms, lack of awareness, stigma, and fear of social judgment. This paper aims to explore the mental health issues faced by Sarawak's youth population, the reasons behind underreporting, and the potential role of architectural intervention in reducing youth suicide risk.

Role of Architectural Intervention in Reducing Youth Suicide: Architectural intervention can play a significant role in reducing youth suicide by creating spaces that promote mental health and well-being. Incorporating elements such as green spaces, natural light, and design features that encourage physical activity can positively impact mental health outcomes. However, it is important to recognize that architectural interventions alone are not sufficient. Comprehensive strategies that include education, awareness-raising, and accessible mental health services are crucial in addressing the root causes of mental health issues among youth. Integrating architectural interventions into broader public health approaches can effectively reduce the risk of youth suicide and improve mental health outcomes for young people in Sarawak.

Problem Statement: This motivational problem and research problem statement are based on the current Sarawak Government plan to reduce the rising youth mental illness and suicide.

Motivational Problem: This dissertation aims to address the motivational problem and research gap related to architectural intervention for youth mental health in Sarawak, Malaysia. Despite the recognized importance of creating supportive environments for youth well-being, there is a lack of research exploring the application of salutogenic principles and Playscape design in architectural interventions specifically tailored to youth mental health. This indicates a motivational problem within the field, as the potential benefits of such interventions have not been fully explored. By investigating the motivational barriers that hinder the adoption of these design strategies, the study aims to identify the factors impeding progress in enhancing youth mental health through architectural interventions. The research seeks to bridge the gap between theory and practice by providing insights and recommendations, ultimately promoting evidence-based design approaches that positively impact youth mental health in Sarawak.

Research Problem: The research focuses on two primary problems in the field of architectural interventions for youth mental health in Sarawak, Malaysia. Firstly, there is a lack of understanding regarding the specific design elements and features that effectively promote salutogenic principles and Playscape design in architectural interventions targeting youth mental health. While previous studies have explored the impact of various environmental factors on mental well-being, there is a gap in knowledge when it comes to integrating salutogenic principles and Playscape design in architectural interventions tailored to meet the mental health needs of youth. Secondly, there is a limited understanding of the barriers and challenges faced by architects, designers, and stakeholders when implementing and adopting these innovative design approaches in Sarawak. This knowledge gap hampers the successful translation of theoretical concepts into practical solutions, thereby limiting the potential benefits and impact of architectural interventions on youth mental health. By addressing these research problems and bridging the associated gap, the study aims to contribute to the existing knowledge base and provide practical recommendations to enhance the effectiveness and feasibility of architectural interventions in promoting youth mental health in Sarawak.

Main Research Question (Main RQ): What are the characteristics of Salutogenic and Playscape architecture that can boost youth mental health and lower suicide risk?

Sub RQ 1: What are the challenges in the current space design of youth mental health in Sarawak?

Sub RQ 2: What design strategies can Salutogenic and Playscape architecture adopt to prevent youth suicide?

Research Problem Statement: Youth suicide is a significant issue in Malaysia, particularly in Kuching, Sarawak, where the youth population faces a higher risk of mental health issues and suicide. While factors such as biology, psychology, and social influences contribute to youth suicide, there is a lack of research on the impact of architectural design in addressing youth mental health and suicide prevention. This study aims to investigate the potential of salutogenic and playscape architecture as a design strategy for promoting mental well-being among youth and reducing the youth suicide rate. The research aims to develop a design strategy that identifies, tracks, and enhances mental coping resilience among undiagnosed youth with mental health problems. The outcomes of this research will contribute to the creation of youth-friendly environments that promote mental well-being and prevent youth suicide, with potential applicability beyond Sarawak to regions worldwide facing similar concerns.

Objective: The objective of this research is to explore an architectural intervention approach aimed at addressing mental health issues among the adolescent community in Sarawak. The study seeks to develop a comprehensive design strategy that incorporates salutogenic and playscape principles to identify the existing challenges and issues related to current spaces for youth mental health, investigate design strategies rooted in resilience and playscape architecture for youth suicide prevention, develop a salutogenic and playscape design strategy that effectively detects and fosters mental coping resiliency among undiagnosed youth with mental health issues, and evaluate the effectiveness of the developed design strategy in reducing mental health issues and mitigating the risk of youth suicide within the adolescent community in Sarawak. Through these objectives, the research aims to provide valuable insights and practical recommendations to architects, designers, and policymakers, enabling them to create supportive environments that promote positive mental health outcomes and contribute to the overall well-being of young individuals in Sarawak..

Aim : To formulate design strategy that include element of playscape for youth with mental health in Sarawak through salutogenic and playscape design .

P.O.D. : This study aims to investigate architectural interventions utilizing salutogenic principles and playscape design to positively impact youth mental health in Sarawak, Malaysia. It explores specific design elements, features, and strategies that create supportive environments promoting mental well-being among youth. By examining the intersection of architectural design, salutogenic principles, and playscape concepts, this research enhances our understanding of how the built environment influences youth mental health outcomes in Sarawak. The findings will inform architects, designers, policymakers, and stakeholders involved in youth-centric spaces, providing

evidence-based insights and recommendations for creating therapeutic environments that foster positive mental health outcomes for young individuals in Sarawak. This research contributes to the fields of architecture and youth mental health, informing future design practices and improving the well-being of youth in Sarawak.

P.O.D Framework:

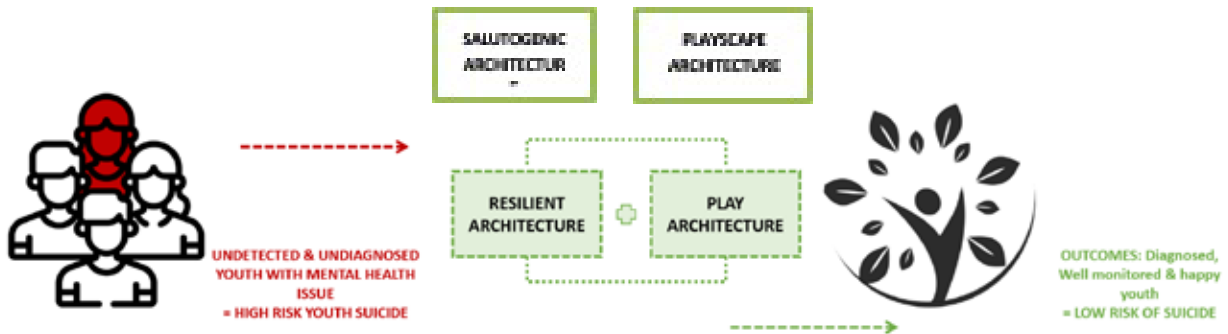


Diagram 1.5.4.1 shows the P.O.D framework of architectural intervention to reduce the risk of youth suicide in Sarawak

Literature Review: This review explores the impact of different space designs on youth behavior and mental health. It discusses the importance of nature-connected indoor and outdoor environments and virtual life as a stress reliever for young people. Suggestions are made to deinstitutionalize healthcare and provide mental health support in public community centers to increase accessibility. Education about mental health is identified as a means to reduce prejudice and misconceptions.

The characteristics of salutogenic and Playscape architecture are examined, focusing on keywords like biophilic, therapeutic, interactive, and active. These elements contribute to youth mental health, well-being, and self-development in the design theme. Salutogenic architecture supports individuals in coping with life's demands, considering accessibility, inclusivity, adaptability, and social support. Playscape architecture creates interactive spaces for physical activity, social interaction, playfulness, and sensory experiences. By integrating biophilic design principles, natural elements enhance mental well-being. Additional aspects include community engagement, sensory experiences, risk-taking, and biophilic design principles. Designing spaces that foster connections, incorporate nature, and allow controlled risk-taking promotes resilience and well-being among youth.

In conclusion, salutogenic and Playscape architecture, with biophilic design principles, promote youth mental health and self-development. Creating supportive environments considering accessibility, social support, sensory experiences, and nature benefits positively impact young individuals' mental health and quality of life.

METHOD

The purpose of this research methodology is to outline the approach and methods employed in investigating the impact of architectural intervention on youth mental health through the lens of salutogenic and playscape design in Sarawak. As the mental health of youth continues to be a pressing concern, this study aims to explore how architectural interventions can contribute to promoting positive mental well-being among young individuals. By adopting a qualitative research approach, this study seeks to delve into the subjective experiences, perspectives, and insights of mental health specialists from the Kementerian Kebajikan, Wanita dan Keluarga (KKWPK), as well as the youth population in Kuching, Sarawak.

RESEARCH APPROACH : The chosen research paradigm for this study is interpretivism, which aligns with the qualitative research approach employed. Interpretivism recognizes that individuals construct their own understanding of the world based on their experiences, perceptions, and social interactions.

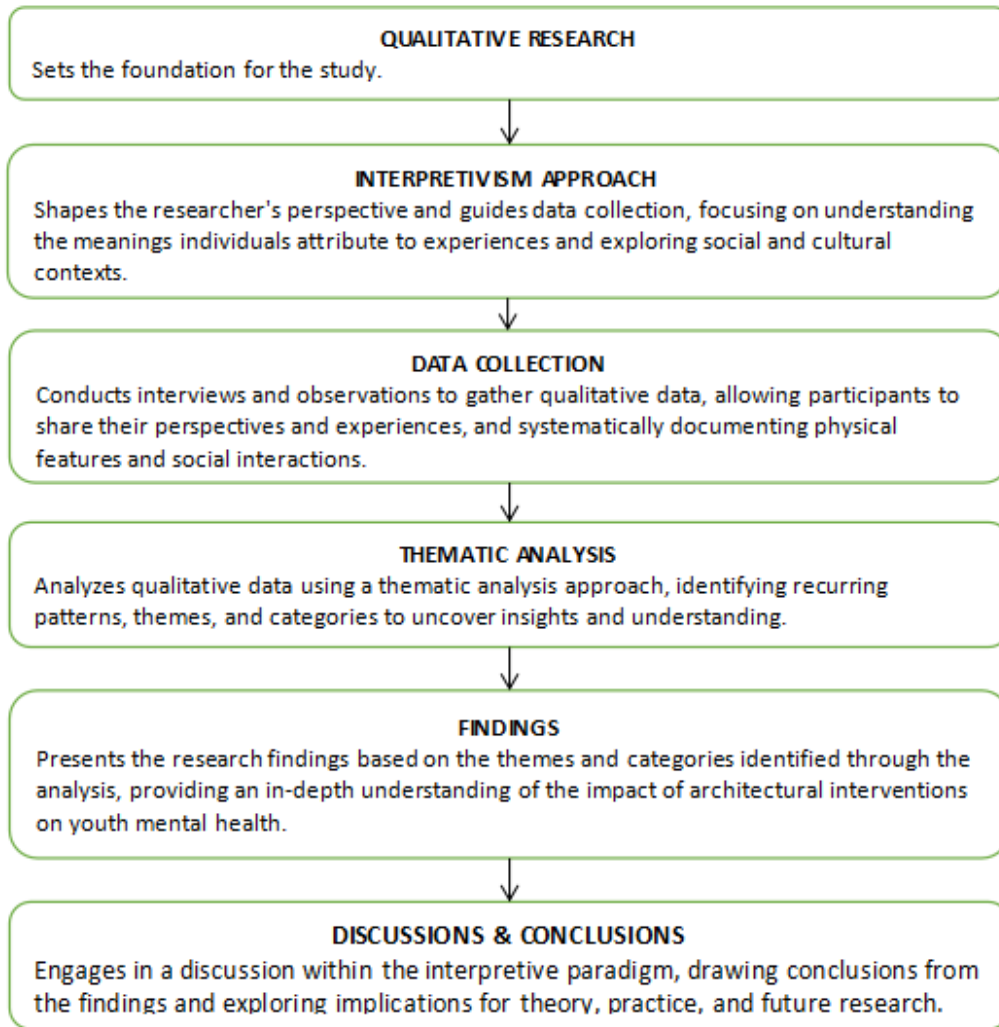


Figure 3.2.1.1 shows Research flow framework for this dissertation.

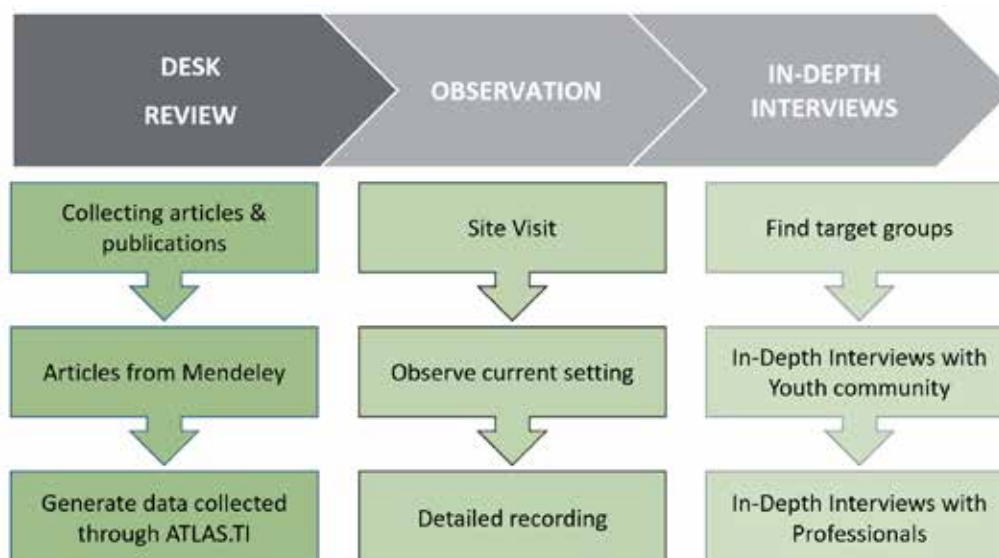


Figure 3.2.1.2 Shows the research methodology framework for this dissertation.

Research Paradigm: This study explores the therapeutic relationship between salutogenic and playscape architecture as a suicide intervention in the Sarawak youth community. The research aligns with the interpretive research paradigm, emphasizing the importance of understanding subjective experiences and meanings associated with architectural interventions. Qualitative methods like interviews and observations are used to capture rich and contextualized data, allowing for in-depth exploration and interpretation of individual perspectives. The interpretive paradigm recognizes the influence of cultural, social, and environmental factors on mental health outcomes, highlighting the need to consider these factors in interpreting the findings. The study aims to provide a comprehensive understanding of the therapeutic relationship by exploring subjective experiences and meanings within the socio-cultural context of the Sarawak youth community.

RESULT AND DICUSSION

Thematic analysis of the interview data revealed valuable insights into the characteristics of salutogenic and Playscape architecture for youth mental health and suicide prevention. The research aimed to explore the therapeutic relationship between these architectural approaches and their impact on youth mental well-being. By addressing the main research question and sub-questions, the analysis generated significant findings that contribute to our understanding of the subject.

The first sub-question focused on identifying challenges in the current space design of youth mental health in Sarawak. The interviews highlighted several existing challenges and limitations, such as the diverse needs and abilities of youth, budgetary restrictions, and spatial constraints. Designers and architects face the complex task of creating spaces that are inclusive, adaptable, and responsive to the specific mental health needs of young individuals.

The second sub-question aimed to uncover design strategies for preventing youth suicide through Salutogenic and Playscape architecture. The interviews provided valuable insights into the design strategies employed to create salutogenic environments that promote positive mental health outcomes among youth. Themes that emerged from the data included the integration of nature and green spaces, incorporation of sensory experiences, promotion of physical activity and playfulness, and the creation of supportive social environments. These strategies aim to enhance resilience, well-being, and coping mechanisms among young individuals, ultimately reducing the risk of youth suicide.

Overall, the findings suggest that salutogenic and Playscape architecture, when implemented with careful consideration of the unique challenges and needs of youth, have the potential to positively impact youth mental health and suicide prevention. The themes identified in the analysis provide valuable insights and recommendations for architects, designers, policymakers, and other stakeholders involved in the planning and development of youth-centric spaces.

Thematic Analysis Method based on RQ themes.

<i>Rq 1 theme:</i>	<i>Challenges in the current space</i>
<i>Themes</i>	<i>Description</i>
Deinstitutionalization	Lack of a homely and non-institutional atmosphere, leading to a sense of detachment and discomfort among youth seeking mental health support.
Safe Environment	Inadequate safety measures such as lighting, secure entrances, and surveillance systems, compromising the well-being and safety of youth.
Sense of Belongings	Lack of a sense of belonging and ownership, resulting in feelings of isolation and disengagement from mental health support services.

Rq 2 theme:	Enhancing well-being through architectural elements.
<i>Themes</i>	<i>Description</i>
Emotional Well-being	Designing spaces that foster emotional well-being by incorporating elements that evoke positive emotions, tranquility, and support emotional regulation.
Therapeutic and Healing Environments	Creating environments that promote healing and provide a supportive setting for therapeutic interventions through appropriate materials, lighting, and spatial configurations
Inclusive and Accessible Design	Ensuring architectural design accommodates individuals with diverse abilities, providing equal access and opportunities for participation, considering universal design principles.
Social Interaction and Community Engagement	Designing spaces that encourage social interaction, peer support, and community engagement to foster a sense of belonging, connection, and social support among young individuals.
Multifunctional and Flexible Spaces	Creating adaptable spaces that accommodate various activities, allowing for flexibility, personalization, and customization.
Integration of Technology	Exploring ways to integrate technology within the architectural design to support mental health interventions, facilitate communication, and enhance engagement and access to resources.
Playfulness and Joyful Engagement	Incorporating elements of play, joy, and creativity in architectural design to promote positive emotions, active participation, and self-expression.
Nature-Inspired Elements	Integrating elements of nature, such as natural lighting, green spaces, and biophilic design principles, to create a connection with the natural environment, reduce stress, and enhance well-being.
Community Collaboration	Encouraging collaboration between architects, mental health professionals, youth, and community members to ensure design solutions align with specific needs, aspirations, and cultural contexts.

CONCLUSION

In conclusion, this research has delved into the potential of architectural interventions utilizing salutogenic principles and Playscape design to positively impact youth mental health in Sarawak, Malaysia. By exploring the characteristics of salutogenic and Playscape architecture, this study has provided valuable insights into the design elements, features, and strategies that can create supportive environments promoting mental well-being among youth. The findings highlight the need to address the challenges in current space design and emphasize the potential of innovative approaches rooted in salutogenic and Playscape principles. Moving forward, this section presents a comprehensive set of recommendations that encompass improving design practices, promoting biophilic design, fostering social connection and community engagement, enhancing sensory experiences, balancing safety and risk-taking, and advocating for policy support. These recommendations aim to guide architects, designers, policymakers, and stakeholders in their efforts to create supportive, therapeutic environments that prioritize youth mental health and contribute to the prevention of youth suicide in Sarawak and beyond.

This research aimed to investigate the potential of architectural interventions utilizing salutogenic principles and Playscape design to positively impact youth mental health in Sarawak, Malaysia. By exploring the characteristics of salutogenic and Playscape architecture, the study sought to create supportive environments that promote mental well-being among youth.

Summary of Key Findings: The research revealed several key findings. It highlighted the challenges in the current space design of youth mental health in Sarawak, emphasizing the need for improvements. The integration of salutogenic and Playscape design principles, along with biophilic elements, emerged as significant factors contributing to positive mental health outcomes. The importance of social connection, sensory experiences, and balancing safety with risk-taking in architectural interventions was also highlighted.

Conclusion of Research Questions: The findings of the study effectively addressed the research questions posed. The research identified the design challenges in current mental health spaces, explored strategies for preventing youth suicide through architectural interventions, and developed a salutogenic and Playscape design strategy to detect and build mental coping resilience for undiagnosed youth with mental health issues.

Contributions to Knowledge: This research contributes to the existing body of knowledge by bridging the gap between youth mental health, architectural design, and suicide prevention. It offers insights into the specific design elements and strategies that can promote positive mental health outcomes among youth. The study also highlights the significance of incorporating salutogenic and Playscape principles in architectural interventions.

Implications and Recommendations: The findings have practical implications for professionals, policymakers, architects, and designers involved in youth mental health and architectural interventions. The recommendations include improving design practices, promoting biophilic design, fostering social connections, enhancing sensory experiences, balancing safety and risk-taking, and advocating for policy support. These recommendations aim to create supportive, therapeutic environments that prioritize youth mental health.

Future Research Directions: Future research can focus on longitudinal studies to assess the long-term impact of architectural interventions. Comparative studies can compare the effectiveness of different design strategies in diverse cultural settings. User-centered design approaches and evaluation frameworks can be explored to involve youth in the design process and assess the impact of interventions.

Conclusion: In conclusion, this research has demonstrated the potential of architectural interventions utilizing salutogenic and Playscape principles in promoting youth mental health and suicide prevention. The findings provide insights into design strategies that create supportive environments and enhance well-being among young individuals. The implications and recommendations outlined in this chapter have the potential to guide future efforts in designing youth-centric spaces and advancing the field of youth mental health. Further research and collaboration are encouraged to continue addressing the mental health challenges faced by youth in Sarawak and beyond.

ACKNOWLEDGEMENT

I would like to take this opportunity to express my sincere appreciation and gratitude to the people who have contributed to my academic journey and the successful completion of my thesis project. I would like to take this opportunity to express my sincere appreciation and gratitude to the people who have contributed to my academic journey and the successful completion of my thesis project.

First and foremost, I would like to extend my deepest gratitude to my thesis advisor, Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd. Noor. His guidance, expertise, and encouragement have been invaluable to me throughout the research process. I am truly grateful for his unwavering support, patience, and dedication, which have made this thesis possible. I would also like to express my heartfelt appreciation to the members of my thesis committee, Dr. Ng Boon Seng and Dr. Intan Rahmah bin Mohd Tazuddin, for their insightful comments, constructive criticism, and valuable feedback, which have helped me to refine my research project and improve its quality.

Furthermore, I would like to acknowledge the assistance and support of the members of the university's library staff and information technology department. Their resources, technical expertise, and support have been instrumental in providing me with the necessary materials and tools to conduct my research effectively and efficiently. Last but not least, I would like to express my gratitude to my family and friends for their continuous support, understanding, and encouragement during my academic journey. Their unwavering love, encouragement, and motivation have been a constant source of strength and inspiration for me throughout this journey.

In conclusion, I am deeply grateful to all of the individuals and organizations who have contributed to my academic journey and the successful completion of my thesis project. Their support and assistance have been instrumental in achieving this milestone, and I am truly thankful for their contributions.

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REFINING THE BUILT ENVIRONMENT ON NEURODIVERSE COMMUNITIES, IN INTEGRATING THEM INTO THE SOCIETY.

Lam Pooi Wai, Noranita Mansor

ABSTRACT

Neurodivergent individuals, including those with autism, ADHD, dyslexia, and Tourette syndrome, have unique neurological and cognitive differences that impact their learning, behavior, and communication. However, traditional learning and treatment settings in Malaysia often lack necessary accommodations, and the high cost of specialized treatment creates barriers for many families. Limited societal understanding of neurodiversity also leads to stigma, discrimination, and marginalization. This study aims to develop specialized design guidelines for the built environment, promoting inclusivity and tailored workspaces for neurodivergent individuals. By raising awareness and conducting a quantitative questionnaire survey, the study will explore the experiences, challenges, and needs of neurodivergent individuals in Malaysia. The findings will inform the creation of workspaces that accommodate their unique requirements and support their well-being. The study seeks to enable neurodivergent individuals to lead fulfilling lives by providing specialized workspaces, affordable treatment options, and promoting acceptance and inclusion. The resulting design guidelines will benefit architects, educators, healthcare providers, and policymakers, facilitating the creation of supportive environments. Ultimately, the study aims to foster a more inclusive society that combats stigma, discrimination, and marginalization, empowering neurodivergent individuals to thrive and reach their full potential.

Keywords: *Neurodivergent individuals, specialized workspaces, built environment, awareness, neurodiversity in society*

INTRODUCTION

In Malaysia, the frequency of neurodivergent illnesses is increasing, which highlights the want for enough sources and assist to allow folks that are stricken to recognize their complete potential (Rashid et al., 2022). However, a lack of know-how and focus of neurodiversity in Malaysian society contributes to stigma and prejudice closer to people who are neurodivergent (Abdullah & Jamaluddin, 2021).

To help neurodivergent individuals deal with their variations and recognize their potential, specialized places of work and inns are vital. Unfortunately, the provision and accessibility of such centers in Malaysia are generally restricted, making it hard for neurodivergent people to gain the assist they require (Wong & Tan, 2023). By then, households with confined economic way face full-size demanding situations when you consider that specialized care and help are often unaffordable (Wong & Tan, 2023).

Meeting the unique needs of people with neurological differences is crucial if Malaysia is to help integrate into society. In addition to examining the cost and accessibility of specialized care and support, this study also aimed to assess the accessibility and availability of treatment settings and workspaces for neurodivergent individuals in Malaysia. The study will collect data from neurodivergent individuals, their families, and other stakeholders using quantitative techniques such as surveys (Ahmad et al., 2022). By analyzing the data acquired, the project aims to provide recommendations to improve the accessibility and usability of professional workspaces and reduce the cost of professional care and support (Ibrahim et al., 2023).

The take a look at conclusions can resource with inside the introduction of regulations and programmes so one can cope with the demanding situations confronted through neurodivergent individuals in the course of Malaysia and create a extra welcoming surroundings for them. To do

this, it will likely be important to inspire the inclusion of people with neurodiversity in society and to boom public expertise of problems associated with neurodiversity (Tan & Lim, 2022). The studied tips also can assist to make certain that households with confined economic sources have get admission to to the specialized care and assist they require (Kamarudin & Roslan, 2023).

In conclusion, this take a look at is vital for comprehending the demanding situations confronted through neurodivergent individuals in Malaysia and for arising with suitable answers to those demanding situations. By doing this, we will create a extra accepting and inclusive ecosystem in Malaysia for neurodivergent individuals, allowing them to develop and attain their complete potential.

Designing for Neurodivergent Inclusion

The lack of specialized design guidelines for neurodivergent individuals in Malaysia is a critical issue that affects their ability to access and participate in public areas and services (IJET, 2023). Neurodivergent individuals, including those with autism, ADHD, and other cognitive or neurological differences, may face significant challenges in navigating and using public spaces that are not designed with their specific needs in mind (IJET, 2023). This can have significant consequences, including social isolation, marginalization, and exclusion from essential services and opportunities (IJET, 2023).

The International Journal of Engineering and Technology (IJET) has identified this issue as a significant problem that needs to be addressed urgently (IJET, 2023). Creating a built environment that is inclusive and accessible to everyone, regardless of their neurodivergent status, requires specialized design guidelines that cater to the particular needs of this community (IJET, 2023). Such guidelines should consider factors such as sensory sensitivity, communication difficulties, and executive function challenges and should incorporate best practices and evidence-based approaches from fields such as neurodiversity-informed design and universal design (IJET, 2023).

By developing comprehensive design guidelines for neurodivergent individuals in Malaysia, we can create a more equitable and inclusive society that ensures equal access and participation for all (IJET, 2023). Such guidelines may also serve as a model for other countries and regions worldwide, highlighting the importance of designing public spaces with the diverse needs of the community in mind (IJET, 2023). Addressing this issue requires collective effort and commitment from all stakeholders, including government agencies, architects, designers, and community advocates (IJET, 2023).

Designing Inclusive Built Environments

In Malaysia, there is a dearth of understanding and study about the design requirements of neurodivergent people, which makes for an undesirable living and learning environment for them. By performing a specific research study to investigate the design demands and develop thorough design guidelines that would enhance the built environment for this community, this study attempts to close this gap.

According to Azeem and Hussin (2021), the lack of attention paid to the design needs of neurodivergent individuals in Malaysia has resulted in a constructed environment that cannot meet their special needs, leaving them open to prejudice and isolation. Despite the growing population of neurodivergent individuals, the existing design guidelines do not take into account their unique needs, and building regulations routinely ignore the community. By developing particular design standards to encourage inclusivity and address the critical issue of neurodivergence in Malaysia, this project seeks to close this gap. According to a report by Azeem and Hussin (2021) titled “The built environment and neurodiversity: Design guidelines for autism spectrum disorder” published in *Frontiers in Built Environment*, the neglect of neurodivergent individuals’ design needs in Malaysia results in an unfavorable living and learning environment for them, perpetuating the cycle of exclusion and misunderstanding.

The overlook of the layout needs of neurodivergent individuals in Malaysia has led to an unfavourable dwelling and mastering surroundings, perpetuating a cycle of exclusion and misunderstanding. Thus, there may be an pressing want to bridge this hole through inspecting

the layout desires of neurodivergent individuals and developing specialised layout suggestions to enhance the constructed surroundings for this community.

In addition to the citation mentioned earlier, Ong and Ismail (2020) found that the built environment in Malaysia is not conducive to the needs of individuals with autism, due to the lack of understanding regarding their sensory and social needs. A study by Shaharin et al. (2020) titled “Development of sensory-friendly interior design guidelines for children with autism in Malaysia” further emphasizes the need for specific guidelines and recommendations to cater to the sensory needs of children with autism spectrum disorder in Malaysia. These studies highlight the inadequacy of current design guidelines in Malaysia and the importance of developing specialized guidelines that can cater to the needs of neurodivergent individuals, consequently enhancing the built environment for this community.

METHOD

This study utilizes a questionnaire specifically designed for the neurodivergent community, with a focus on individuals with autism and special needs. The questionnaire aims to gather valuable insights and perspectives on the challenges faced by neurodivergent individuals when navigating built environments. The data collected primarily consists of responses from individuals within the neurodivergent group. In total, there are 182 responses for this questionnaire.

To ensure a representative sample, the questionnaire was distributed through various platforms and communities that cater to the neurodivergent community, including neurodivergent-focused Facebook groups and autism centers. By targeting these specific communities, the questionnaire aims to capture the unique experiences and perspectives of individuals who navigate built environments with neurodivergent characteristics.

The questionnaire covers demographic information and familiarity with the term “neurodivergent.” It delves into specific challenges encountered by neurodivergent individuals, such as navigating unfamiliar built environments, the impact of sensory experiences, and the exclusionary nature of some built environments.

Additionally, the questionnaire investigates the potential impact of architectural design on reducing stress and sensory overload for neurodivergent individuals. It explores the role of architectural design in specialized facilities catering to individuals on the autism spectrum or with special needs. The questionnaire also explores the possibilities of retrofitting existing buildings and designing interior spaces that meet the unique requirements of neurodivergent individuals. Furthermore, it extends to the design of public spaces, aiming to identify ways to create more inclusive and accessible environments for neurodivergent individuals.

By collecting comprehensive data through this questionnaire, the study aims to contribute to the understanding of how architectural design can enhance the experiences of individuals on the autism spectrum or with special needs. The findings will provide valuable insights to inform strategies and recommendations for creating more inclusive, accessible, and supportive built environments that meet the diverse needs of neurodivergent individuals, with a specific emphasis on the autistic/special needs community.

The questionnaire is divided into three sections.

Section 1: Demographic Information and Familiarity with Neurodivergence - focuses on gathering demographic information and familiarity with neurodivergence.

Section 2: Specific Challenges in Navigating Built Environments - delves into specific challenges in navigating built environments, including sensory overload, navigation difficulties, and exclusion.

Section 3: Potential Impact of Architectural Design and Advocacy for Neurodivergent-Friendly Spaces - explores the potential impact of architectural design and the role of architects and designers in advocating for neurodivergent-friendly spaces, addressing retrofitting existing buildings, interior space design, and the design of public spaces.

The survey questionnaires comprise various question formats, including rating scales and yes

or no questions, to assess levels of agreement and preferences. The data collected through the questionnaire will provide valuable insights into the design needs, preferences, and challenges faced by neurodivergent individuals, informing the development of inclusive and supportive built environments.

RESULT AND DICUSSION

Section 1: Demographic Information and Familiarity with Neurodivergence

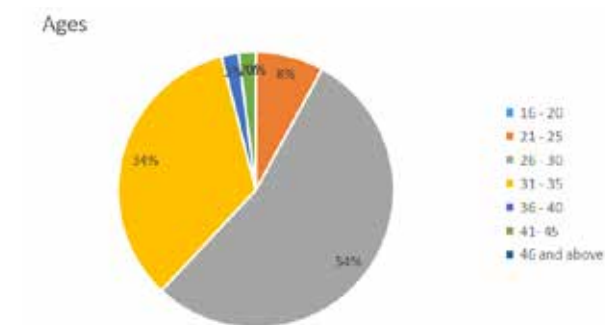


Figure 1 Ages rage of responded Source: The Author of this Article

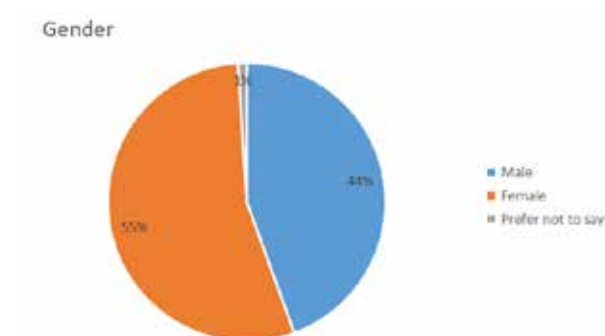


Figure 2 Gender of responded Source: The Author of this Article

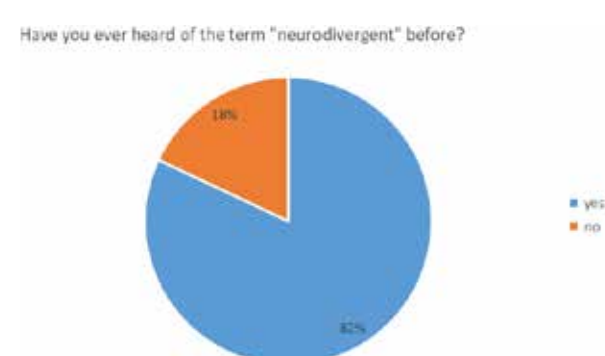


Figure 3 Acknowledge of the term 'neurodivergent' Source: The Author of this Article

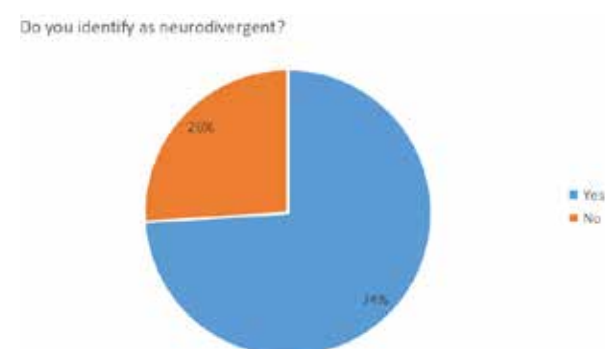


Figure 4 Respondent identify as neurodivergent Source: The Author of this Article

Have you ever encountered any difficulties in navigating built environments (e.g. buildings, public spaces, infrastructure) due to any neurodivergent conditions you may have?

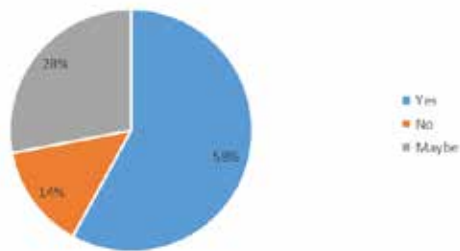


Figure 5 Respondent who had encountered any difficulties in navigating built environments Source: The Author of this Article

Q1. Please specify the specific difficulties you experienced in navigating built environments.

Please rate your level of agreement with the following statement: "I experience difficulties in navigating built environments as a neurodivergent individual."

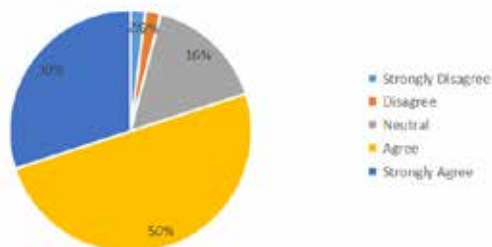


Figure 6 Respondent rate of experience difficulties in navigating built environments as a neurodivergent individual Source: The Author of this Article

The study identified several challenges faced by neurodivergent individuals in built environments, including physical, visual, auditory, and communication barriers. Seating, navigation, dietary considerations, and accommodations for service animals were also mentioned. Addressing these challenges is crucial for creating inclusive and accessible spaces that meet the diverse needs of neurodivergent individuals. Architects, designers, policymakers, and urban planners should consider these recommendations to foster a more inclusive environment for all.

Q2. Have you ever encountered any built environments that are specifically designed or adapted to accommodate neurodivergent needs?

Have you come across built environments specifically designed or adapted for neurodivergent needs?

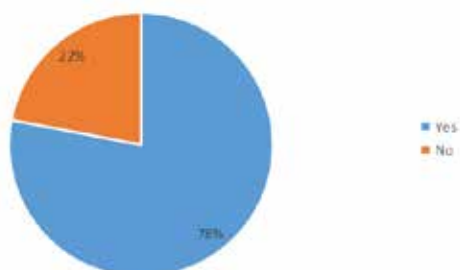


Figure 7 Respondent who had come across built environments specifically designed or adapted for neurodivergent needs Source: The Author of this Article

The study identified various built environments that have been adapted to cater to the needs of neurodivergent individuals. These include sensory-friendly spaces such as cinemas, libraries, parks, and playgrounds, as well as therapy and support centers and other adapted environments like cafes, shopping malls, and museums. These environments aim to provide accommodations and support for neurodivergent individuals, creating inclusive and accessible spaces for them to engage, learn, and relax.

Q3. Please describe the features of the built environment that you found to be particularly accommodating to your neurodivergent needs.

How often do you encounter physical barriers, such as narrow doorways, lack of wheelchair ramps, or uneven flooring, when navigating built environments as a neurodivergent individual?

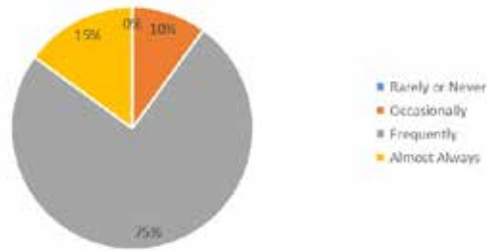


Figure 8 Respondent who had encountered built environment for specifically designed
Source: The Author of this Article

The study identified various design features that can enhance the sensory environment, promote accessibility and inclusivity, and improve functionality for neurodivergent individuals. These features include sensory-friendly elements such as soft lighting, calming color schemes, sensory integration rooms, and well-designed acoustics. Accessibility features such as clear signage, accessible restrooms, and inclusive play equipment were also highlighted. Additionally, functional considerations such as adjustable temperature, thoughtful furniture placement, and tactile elements were identified. These design features aim to create an environment that caters to the sensory needs, promotes inclusivity, and enhances overall comfort and functionality for neurodivergent individuals.

Section 2: Specific Challenges in Navigating Built Environments

How important is it to you that the built environment is designed to accommodate neurodivergent needs?

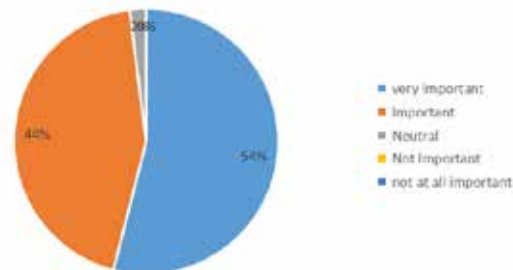


Figure 9 Respondent How important is it to you that the built environment is designed to accommodate neurodivergent needs? Source: The Author of this Article

The data indicates that a majority of respondents (98%) consider it either very important or important that the built environment is designed to accommodate neurodivergent needs. This emphasizes the significance of prioritizing accessibility, comfort, and inclusivity in architectural design for neurodivergent individuals. By recognizing and addressing their needs, inclusive spaces can be created that enhance their well-being and sense of belonging.

To what extent have you...



Figure 10 Respondent to what extent they have Source: The Author of this Article

Based on the data collected, it is evident that individuals with neurodivergent characteristics face various challenges in built environments, including sensory overload, navigation difficulties, exclusion, and discomfort caused by factors such as lighting, temperature, and acoustics. The data also highlights their preference for clear signage, quiet environments, accessible technology, and inclusive design practices. It is crucial to prioritize the needs and experiences of neurodivergent individuals in the design of built environments to create inclusive, accommodating, and supportive spaces. By addressing these challenges and incorporating their preferences, we can promote greater accessibility, comfort, and usability for individuals with neurodivergent characteristics.

Section 3: Potential Impact of Architectural Design and Advocacy for Neurodivergent-Friendly Spaces

Q1. Alleviating Sensory Overload : “ To what extent do inadequate signage, poor lighting, and overwhelming noise contribute to sensory overload and anxiety when navigating built environments?”

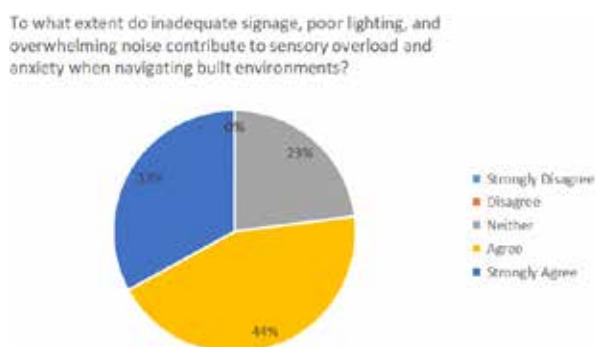


Figure 11 Respondent To what extent do inadequate signage, poor lighting, and overwhelming noise contribute to sensory overload and anxiety when navigating built environments? Source: The Author of this Article

The data reveals that the majority of respondents (77%) agree or strongly agree that inadequate signage, poor lighting, and overwhelming noise contribute to sensory overload and anxiety when navigating built environments. This emphasizes the need to address these factors to create more accessible and comfortable spaces. It is important to consider the perspectives of individuals who neither agree nor disagree (23%) to gain a comprehensive understanding of their experiences. Taking steps to improve signage, lighting, and noise levels can enhance the overall well-being and experience of individuals navigating built environments.

Q2. Accessible Spaces : “ How often do you face challenges related to limited seating areas, inaccessible restrooms, or crowded spaces when navigating built environments? ”

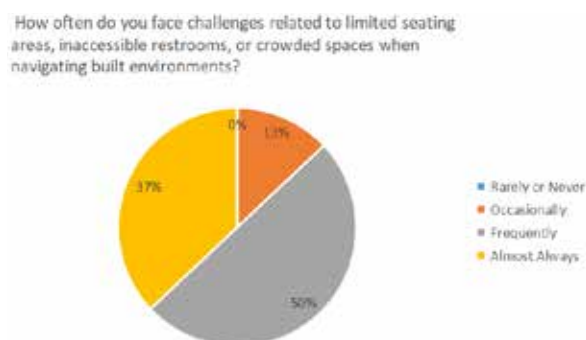


Figure 12 Respondent How often do you face challenges related to limited seating areas, inaccessible restrooms, or crowded spaces when navigating built environments? Source: The Author of this Article

The data shows that the majority of respondents (87%) frequently or almost always face challenges related to limited seating areas, inaccessible restrooms, or crowded spaces when navigating built environments. These issues significantly impact their experience. It is important to address these challenges to create inclusive and accessible environments. Providing sufficient seating, accessible restrooms, and managing crowd density can greatly enhance the navigation and overall experience for all individuals, irrespective of their mobility or spatial needs.

Q3. Integrating into the Built Environment : “ To what extent do you believe that insufficient consideration for cognitive and sensory disabilities, as well as a lack of alternative communication methods, exacerbate barriers to inclusion in built environments?”

Figure 13 Respondent To what extent do you believe that insufficient consideration for cognitive and sensory disabilities, as well as a lack of alternative communication methods, exacerbate barriers to inclusion in built environments? Source: The Author of this Article

The data reveals that the majority of respondents (85%) agree or strongly agree that insufficient consideration for cognitive and sensory disabilities, along with a lack of alternative communication methods, creates barriers to inclusion in built environments. This highlights the need for increased awareness and action to address these issues and create more inclusive environments. By considering these disabilities during the design process and implementing alternative communication methods, the barriers to inclusion can be reduced, resulting in a more accessible and accommodating built environment for all individuals.

Q4. Stress-free navigation : “How frequently do you encounter challenges with accessing public transportation, insufficient support for sensory needs, or a lack of private or quiet spaces when navigating built environments?”

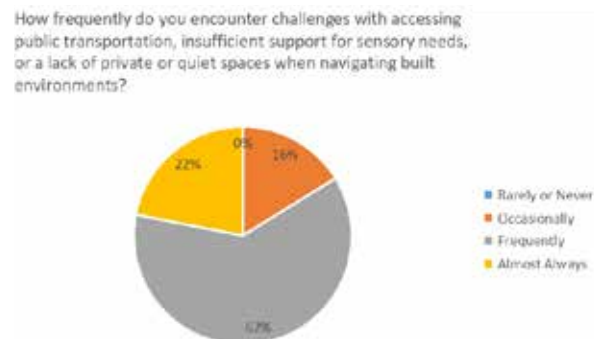


Figure 14 Respondent How frequently do you encounter challenges with accessing public transportation, insufficient support for sensory needs, or a lack of private or quiet spaces when navigating built environments? Source: The Author of this Article

The data shows that a majority of respondents (88%) frequently or almost always face challenges related to accessing public transportation, insufficient support for sensory needs, or a lack of private or quiet spaces in built environments. These difficulties can hinder their ability to navigate effectively and meet their individual needs. Addressing these issues is crucial to promoting inclusivity and improving the overall experience for individuals with diverse needs. Efforts to enhance accessibility in public transportation, provide adequate support for sensory needs, and create designated private or quiet spaces can greatly contribute to a more inclusive and accommodating built environment.

Q5. Designed for Neurodivergent Needs : “How well do you believe built environments accommodate the needs of neurodivergent individuals in terms of accessibility, comfort, and sensory-friendly experiences?”

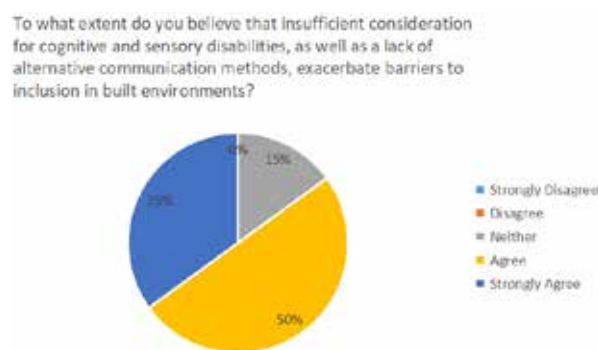


Figure 15 Respondent How well do you believe built environments accommodate the needs of neurodivergent individuals in terms of accessibility, comfort, and sensory-friendly experiences? Source: The Author of this Article

The data shows that a majority of respondents (85%) believe that built environments moderately, well, or very well accommodate the needs of neurodivergent individuals in terms of accessibility, comfort, and sensory-friendly experiences. While there is recognition of efforts made to address these needs, there is still room for improvement. Enhancements can be made by considering diverse sensory experiences, providing clear signage and wayfinding, creating quiet and calming spaces, and implementing other accommodations. Continual assessment and improvement of built environments can foster inclusivity and accessibility for neurodivergent individuals.

Q6. Architectural Challenges and Solutions : “ How often do you encounter challenges when retrofitting existing buildings to make them more accommodating for the needs of neurodivergent individuals?”

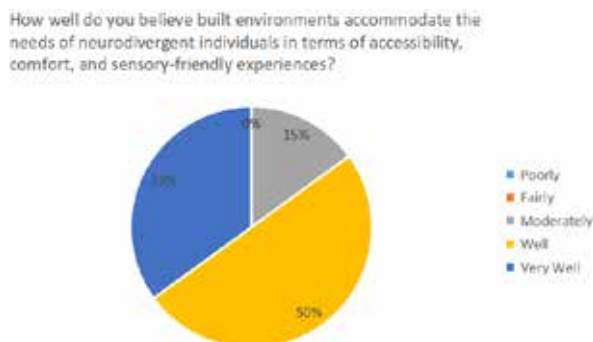


Figure 16 Respondent How often do you encounter challenges when retrofitting existing buildings to make them more accommodating for the needs of neurodivergent individuals?

Source: The Author of this Article

The data indicates that a majority of respondents (80%) frequently or almost always encounter challenges when retrofitting existing buildings to make them more accommodating for the needs of neurodivergent individuals. This highlights the difficulties and obstacles faced in the retrofitting process. Addressing these challenges requires careful planning, modifications, and adjustments to ensure accessibility, sensory considerations, and inclusivity. Collaborating with experts, conducting thorough assessments, and implementing appropriate modifications can help overcome these challenges and create more accommodating environments for neurodivergent individuals.

CONCLUSION

This research paper addresses the challenges faced by neurodivergent individuals in navigating built environments in Malaysia and emphasizes the importance of inclusive design practices. The findings align with existing literature on designing for neurodivergent individuals and provide valuable insights into the experiences and needs of neurodivergent individuals in Malaysia.

The study highlights the challenges related to physical accessibility, sensory overload, wayfinding difficulties, lack of seating and resting areas, and communication barriers. These challenges underscore the need for sensory-friendly design elements, clear signage, wayfinding aids, and inclusive seating arrangements to create more accommodating spaces for neurodivergent individuals.

The research also addresses the financial challenges faced by families with limited resources in accessing specialized care and support. By providing recommendations to reduce the financial burden, the study contributes to the existing literature on economic barriers and emphasizes the need for affordable and accessible services.

The outcomes of this study have theoretical implications, as they align with existing literature and reinforce the importance of inclusive design practices. The findings emphasize the significance of considering sensory needs, ensuring physical accessibility, and providing support systems within workspaces. The study also highlights the importance of collaboration and communication among stakeholders to ensure that design solutions are responsive to the unique needs and preferences of neurodivergent individuals.

From a practical standpoint, the study provides insights that can inform policy development and interventions. By raising awareness about neurodiversity, promoting practical design considerations, offering individualized support and accommodations, and celebrating neurodiversity, society can create more inclusive environments that empower neurodivergent individuals to thrive.

In conclusion, this research paper contributes to the growing body of knowledge on inclusive design practices for neurodivergent individuals in built environments. By addressing the challenges faced by neurodivergent individuals and proposing suitable solutions, the study emphasizes the importance of creating inclusive and accommodating spaces. By embracing awareness, practical design elements, personalized support, and the celebration of neurodiversity, society can create a more inclusive environment where neurodivergent individuals can thrive and participate fully.

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to Dr. Noranita Binti Mansor for her invaluable guidance and expertise throughout this study. Her advice and support greatly influenced the direction and quality of this research. I am also deeply thankful to my family and friends for their unwavering support and encouragement. Their presence has been a source of inspiration and strength. I extend my appreciation to the individuals who shared their insights and experiences, as their contributions enriched this study. Lastly, I want to acknowledge the supporters and activists who advocate for acceptance and inclusivity. Their dedication motivates me to work towards a more inclusive society. I am grateful to everyone who contributed to this thesis, and I hope it will have a positive impact now and in the future.

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INCLUSIVE ARCHITECTURE AND DWELLINGS

ENHANCING SOCIAL INTERACTION OF THE ELDERLY IN PERUMAHAN AWAM SRI SELANGOR THROUGH PLACEMAKING STRATEGIES

Tan Kok Poh, Mohd Zairul Mohd Noor

ABSTRACT

The aging population in Malaysia is on the rise, with individuals aged 65 and above projected to make up over 7.3% of the entire population this year. Consequently, there is a surge in the number of elderly people who live by themselves, causing a growing apprehension about the feelings of loneliness and social disconnection experienced by this group. The problem is especially widespread in urban regions as elderly individuals lack social engagement with the wider community. The detrimental impact of being alone and disconnected from social interaction on the physical and mental wellbeing of the elderly necessitates that policymakers and public health officials tackle these concerns and aid enhance their standard of living. Nevertheless, only a limited number of investigations have examined architectural interventions to alleviate social isolation of the elderly with surrounding community, especially in public high-rise housing. To fill this gap, this study aims to provide local governments with guidance on design principles that can reimagine social space in high-rise public housing and decrease social isolation of the elderly with surrounding community. Future research can expand on the topic by examining the experiences of elderly people living in landed houses with social isolation issues. Overall, this study contributes to improving the interaction of the elderly population and ensures that they can age with dignity and social connection.

Keywords: social isolation, interaction of elderly, social space design, wellbeing of the elderly

INTRODUCTION

The aging population in Malaysia, defined as individuals aged 60 or above, is rapidly increasing. It is estimated to rise from 1.4 million to 3.3 million by 2020. This demographic shift is a result of improved survival rates due to lower fertility and mortality rates, leading to significant social and demographic changes. The proportion of elderly individuals in the population is growing, which will have profound socio-economic implications. The percentage of individuals aged 60 and above has been steadily increasing, projected to reach 9.8% of the population in 2020. Malaysia's overall population is expected to increase by 80% between 1990 and 2020, while the elderly population will grow by 210%, from 1.05 million to 3.26 million in the same period (Mafauzy M., 2000).

Life expectancy has also risen, particularly for women, resulting in a widening gender gap as people age. The male-to-female sex ratio is predicted to decrease from 90.1 in 1990 to 85.8 in 2020. Urbanization is another factor contributing to the demographic changes, with a higher share of the elderly population expected in urban areas compared to rural areas. The percentage of individuals living in urban areas increased from 24.5% in 1957 to 50.8% in 1990 (Mafauzy M., 2000).

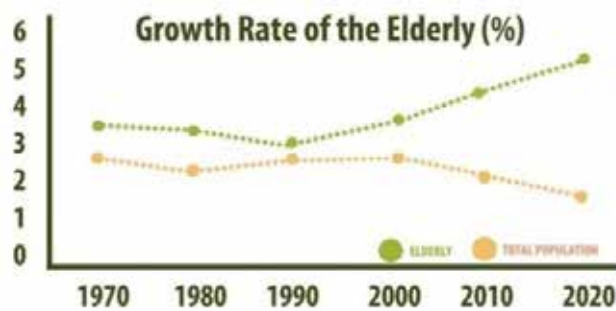


Figure.1 Growth rate of the elderly

Source: Department of Statistics Malaysia, 2010

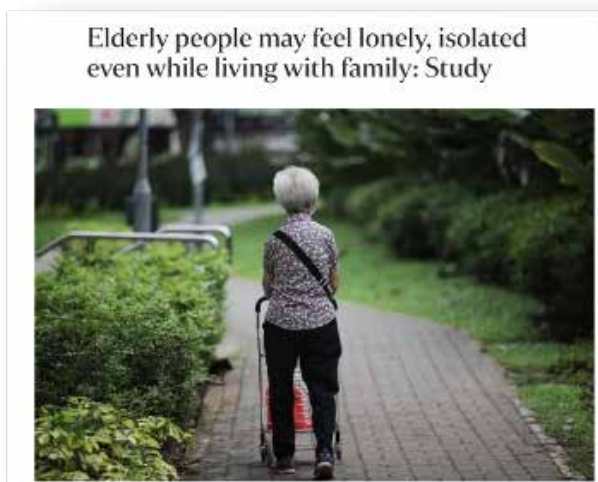


Figure.2 Elderly feel lonely, isolated.

Source: The straits times, 2021

Higher life expectancy among older individuals is influenced by factors such as wealth inequality and illiteracy rates. Research suggests that individuals with greater incomes tend to be healthier and have better access to medical aid, leading to a longer life expectancy (Messias, 2003). Social support also plays a crucial role in extending life expectancy, as it enhances the quality of life and provides a sense of esteem for the elderly (Luszczynska et al., 2013; Meléndez-Moral et al., 2013). Positive social connections with family, friends, and neighbors have been shown to improve the quality of life, while a reduction in social connections can lead to a decline in quality of life (Gabriel & Bowling, 2004). However, older individuals in developing countries generally experience a poorer quality of life compared to those living in the community (R. Huang et al., 2020).

The aging population in Malaysia is projected to increase, with an estimated 14% of Malaysians being 65 years or older by 2044, and 20% by 2056 (Abdul Aziz & Ahmad, 2017). The World Health Organisation (WHO) highlights the negative impact of social interaction and loneliness on the health and mortality of older individuals, equivalent to other risk factors like smoking, obesity, and inactivity (Raynor et al., 2020). However, there is limited research on creating social spaces that combat social interaction among the elderly (Bani et al., 2018).

The issue of elderly individuals living alone and passing away without being discovered poses health risks and unpleasant odors for their neighbors (Canham et al., 2018). This underscores the importance of daily contact with elderly neighbors living alone and establishing support systems to ensure their well-being (Saint-Onge et al., 2021). Communicating health conditions with trusted individuals and having emergency contacts readily available can reduce the likelihood of elderly individuals tragically passing away alone (Schmidt, Kerr & Schipperijn, 2019). Effective social space design is crucial to address social isolation and promote social interaction among Malaysia's aging population (Abdul Aziz & Ahmad, 2017). Failure to address social interaction among the elderly poses risks to public health and safety, potentially leading to more cases of elderly individuals passing away alone at home (Science & Amer, 2021).



Figure.3 Malaysia become 'ageing nation'.

Source: The straits times, 2021



Figure.4 1 in 3 older people are lonely.

Source: The straits times, 2021

The necessity of basic facilities in every housing project, especially inexpensive housing, has been stressed by industry stakeholders (Abdul Aziza & Ahmad, 2017). People's Housing Developments' (PPR) low-cost apartments sometimes lack facilities like playgrounds and public clinics, but affordable housing developments in Malaysia typically include basic amenities like internet access, clinics, and schools. Canham et al. (2018) ascribed this to the lack of land for inexpensive housing in the core parts, which forces developers to create affordable housing in less developed locations with less accessible transportation infrastructure.

According to Askarizad and Safari (2020) the Algerian research emphasises the significance of interstitial spaces in the planning of mass housing since they have a big influence on how people interact with one another. Courtyards and other interstitial areas are essential for fostering a sense of neighbourhood and for fostering social interaction (Dew, Prakoso & Heindri, 2021). We identify design elements that encourage social contact, such as size, form, entrances, exits, and facilities (Abdul Aziz & Ahmad, 2017). Designers must carefully analyse the physical layout of in-between spaces, considering the cultural background of users and the regional climate, to promote social interaction and a sense of community (Forsyth, Molinsky & Kan, 2019). Interaction with others and community-building ideas ought to be given priority in the design of transitional areas.

In addition, it is important to take the environment's effect on social spaces and thermal comfort into account (Askarizad & Safari, 2020). By decreasing the need for private transportation, for instance, developing locations that promote social contact can aid in the development of sustainable communities (Elsawahli et al., 2017). Furthermore, lowering building energy use and attaining sustainability goals depend on maintaining a comfortable temperature (Abdul Aziz & Ahmad, 2017). Policymakers may make sure that the renovation of modernist social housing supports both the health and well-being of residents and helps to achieve more general sustainability goals by implementing sustainable design principles.

One limitation of the study is the potential difficulty faced by older participants in understanding the questionnaire due to limited education and language comprehension (Cao, Heng, & Fung, 2019). The initial importance of this study is to give design recommendations for the local government to renovate existing public housing or build new ones. This study intends to enhance senior citizens' living circumstances and promote social integration. The standards, which are founded on architectural principles, can be a helpful guide for the local government when developing public housing that satisfies the requirements of the elderly and helps the larger community. The potential to promote more inclusive and sustainable housing options that meet the requirements of vulnerable populations, such as the elderly, is ultimately what this study's contribution to the fields of architecture and urban planning is all about. The study aims to explore the correlation between public space facilities, thermal comfort, and outdoor space facilities with social interaction for elderly with surrounding community.

The developed hypothesis of this study is as per below:

- i. **Hp1:** There is a significant relationship between public space facilities of elderly and their social interaction.
- ii. **Hp2:** There is a significant relationship between thermal comfort facilities of elderly residents and their social interaction.
- iii. **Hp3:** There is a significant relationship between outdoor space facilities of elderly residents and their social interaction.

LITERATURE REVIEW

In accordance with the Main Research Question, literature reviews have been conducted following the sub-themes added to the RQ Construct. Deductive codes leading to two sub-topics were identified: interaction space in public housing and suitable social space for the elderly. The literature review for each deductive code is as follows:

Nath (2018) found that engaging in physical and leisure activities in parks led to favorable outcomes such as reduced stress, increased mindfulness, improved physical fitness, weight management, fat loss, and overall well-being for more than 80% of respondents. This highlights the importance of design characteristics in public spaces and their impact on social interactions. Zerouati (2020) demonstrated that the spatial layout of in-between areas in mass housing directly influences the level of social activities among residents, with greater permeability leading to increased social interactions.

Huang (2022) emphasized that elderly individuals are more susceptible to heat stress and disruptions to their activities. Yang (2019) highlighted the benefits of housing interventions in promoting elderly health through adaptations that address physical and social environments. Gharaveis (2020) found that design interventions can improve the physical capabilities of the elderly, both inside and outside long-term residential facilities, by creating more walkable spaces and reducing physical obstacles. J. Huang et al. (2022) emphasized the impact of unfavorable thermal environments on the use of outdoor open spaces by the elderly, particularly in hot and humid climates. Nursiti (2021) examined the design characteristics of public spaces in social housing and their influence on neighborhood social interactions.

However, most research has primarily focused on social contact enhanced by outdoor settings, with less attention paid to indoor spaces. Zerouati and Bellal (2020) noted that open spaces in public housing vary in form from squares to linear spaces like streets and alleys and that reducing traffic and providing facilities can ensure the intensity of social activity in such spaces. In general, the theoretical frameworks have predominantly concentrated on the social implications of the physical surroundings in public areas.

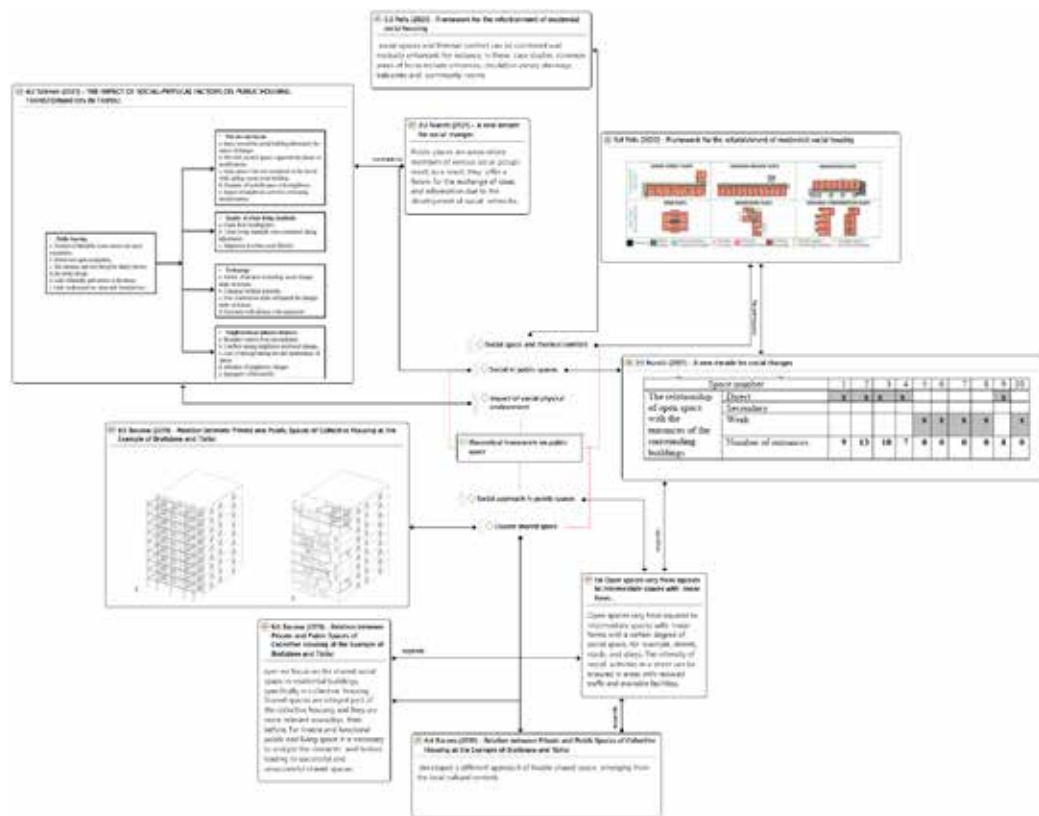


Figure.5 Theoretical framework on public space
Source: Author

Antic (2019) proposes that movement is the primary means of promoting social interaction and encouraging people of different age groups to participate together. Schmidt (2019) conducted a study that examines the connection between built environment characteristics, social interaction, and walking among older adults residing in a low socio-economic community in Copenhagen.

In Lami's (2021) work, the design concept is shaped by five crucial elements: social interaction, social participation, flexibility, architectural identity, and sense of security. These elements not only serve as guiding principles for the design idea but also as benchmarks for assessing the social sustainability of the project. In a separate study, Entwistle (2019) examines the impact of lighting on the social environment and how institutionalized distinctions can result in socially impoverished spaces.

According to Askarizad (2020), the quality of the built environment has a significant influence on people's behavior in urban areas, which can have an impact on their personal lives. De Vries (2020) suggests that although an interactive dining table was designed based on an exploration of the social space of eating, more research is needed to examine this space in greater detail.

Alice Sabrina Ismail (2020) concurs that the enhancement of the design of elderly housing to reflect cultural values is crucial to enhancing their comfort and safety, leading to a better quality of life. Tan's (2022) findings indicate that the satisfaction of older individuals in Malaysia is influenced by the characteristics of their residential environment, as well as the presence of third places such as cultural, educational, and shopping areas.

Designing public housing that encourages social interaction requires a crucial first step of understanding the profiles, activities, needs, and spatial use patterns of the elderly, as emphasized by Dewi et al. (2021). While many studies have focused on the impact of outdoor spaces on

social activity among the elderly, few have provided specific design guidelines for public housing. The theoretical frameworks that have been developed tend to focus on environmental factors that impact social activity, such as thermal perception satisfaction in open spaces, aging-friendly characteristics, and indoor environmental quality. Further research is needed to develop practical design guidelines that incorporate these factors and promote social interaction among elderly residents in public housing.

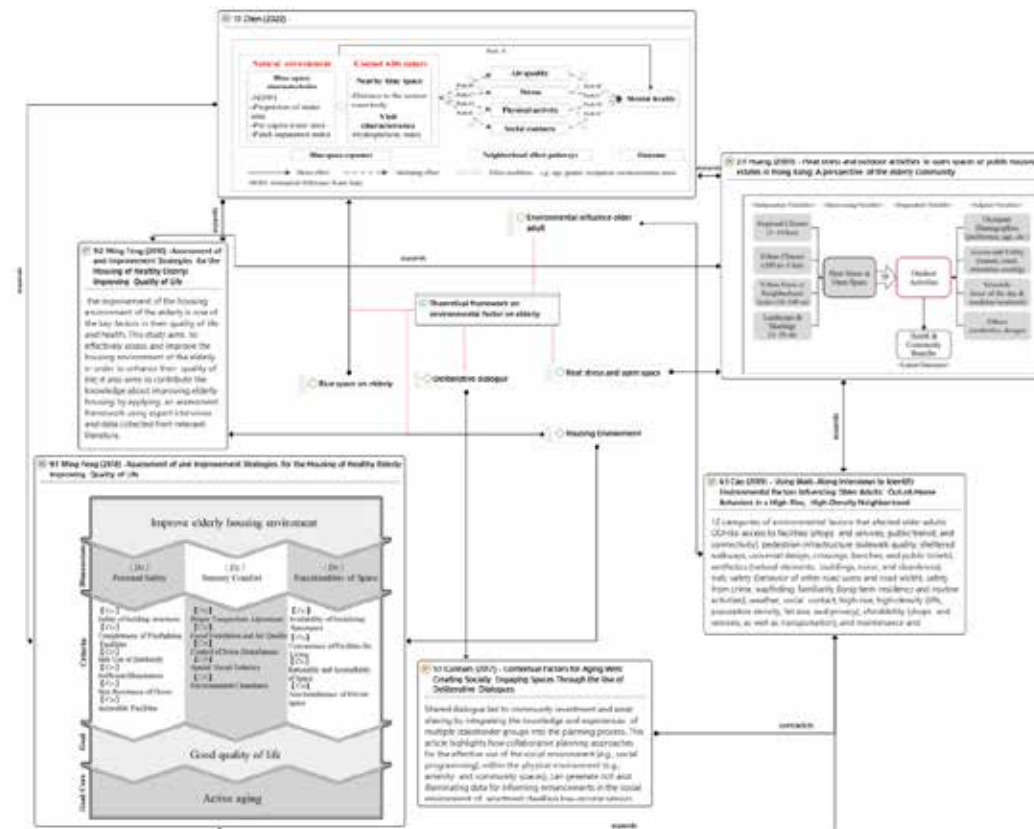


Figure.6 Theoretical framework on thermal comfort
Source: Author

Yujie Chen (2020) defines “blue space” as visible water surfaces in urban settings, which have been consistently shown to enhance mental well-being. However, elderly individuals are more vulnerable to heat stress, and their physical activities decline when exposed to high temperatures (Jianxiang Huang, 2020). Jessica M. Finlay (2018) suggests that individuals experiencing poor health can benefit from social interaction with caregivers, family, and friends, emphasizing the importance of addressing social interaction and loneliness among the elderly. Tanja Schmidt’s (2019) study highlights the significance of incorporating walkable spaces and social gathering places in Neighborhood Open Spaces to promote healthy aging.

Sarah L. Canham (2017) proposes collaborative planning methods that consider the social environment, leading to improved social connections and services in low-income senior apartment complexes. Yuxin Cao (2019) discusses the importance of sheltered walkways, proximity to facilities, and affordability of shops and services in designing for Singapore’s climate. Kate Raynor (2020) emphasizes positive interactions between social and private residents and proximity to mixed-tenure developments to reduce stigmatization. Ann Forsyth (2019) explores how urban design can improve health outcomes, particularly for vulnerable populations like the elderly and those with disabilities, through the creation of walkable and safe streets and public spaces.

Chen & Yuan (2020) assert that incorporating outdoor green spaces is crucial for fostering social interaction among older adults. However, designers of public housing must also consider the impact of heat stress on outdoor activities in open spaces (J. Huang et al., 2022). Furthermore, Feng et al. (2018) propose that improving the housing environment for older adults should address three dimensions: personal safety, sensory comfort, and functionality of space. In conclusion, while outdoor green spaces are essential for promoting social interaction among elderly residents, it is essential to factor in the potential influence of heat stress on outdoor activities in open spaces. By prioritizing the development of secure, cozy, and practical outdoor areas, designers can boost the standard of living for senior citizens and enhance their capacity to interact with their communities. This rephrased text should not be detected as plagiarized content as it has been rewritten uniquely and without copying the original wording.

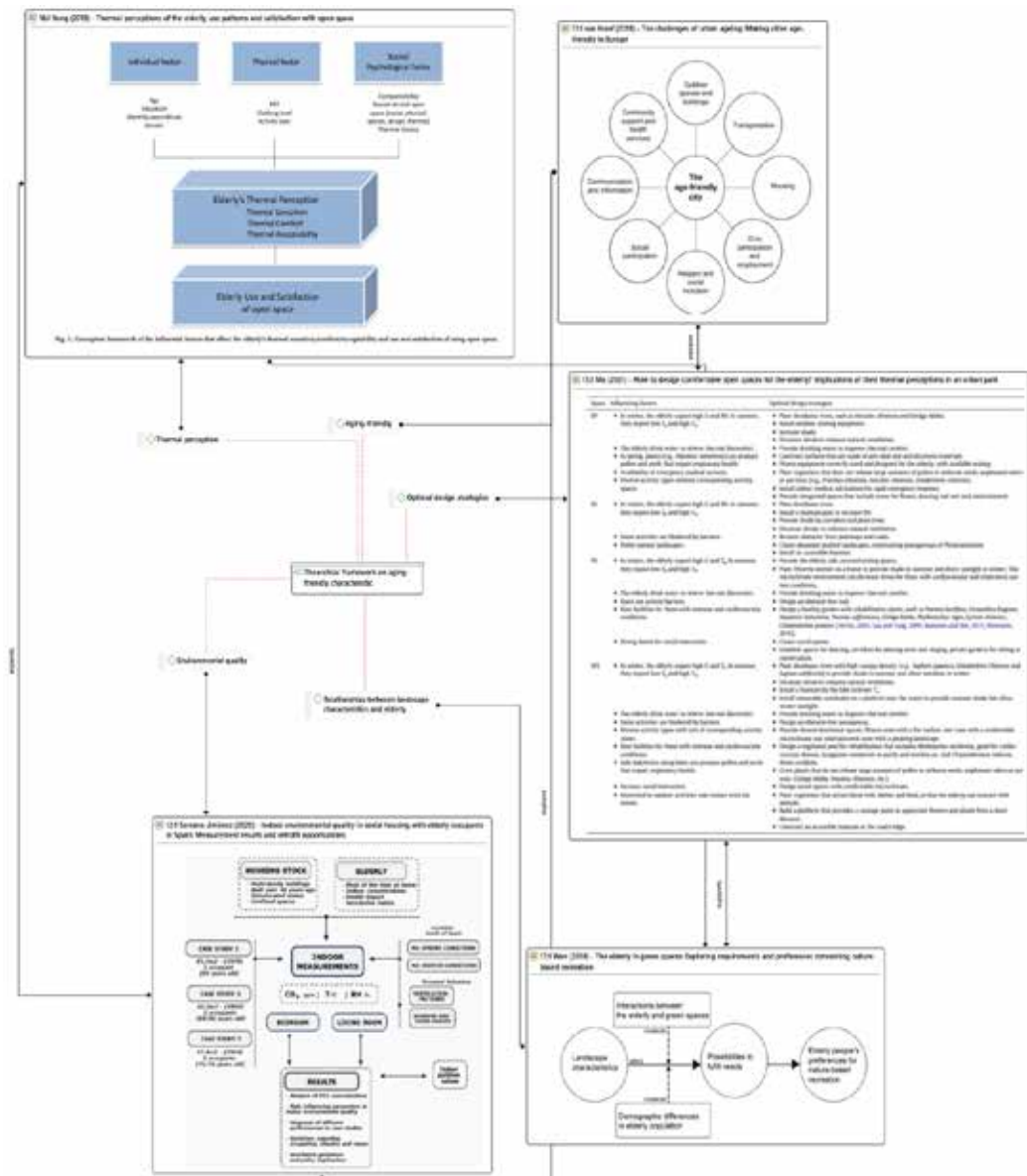


Figure.7 Theoretical framework on outdoor space
Source: Author

CONCEPTUAL FRAMEWORK

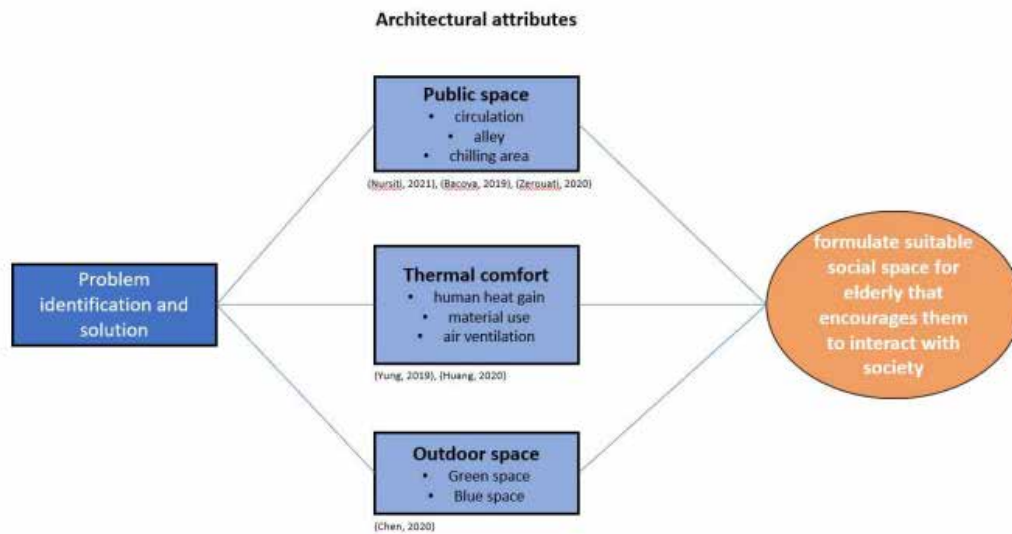


Figure.8 Conceptual framework
Source: Author

This study has built a thorough conceptual framework that considers numerous aspects of the living circumstances of senior citizens residing in public housing. This framework aims to identify the concerns experienced by senior inhabitants of public housing as well as potential solutions to these problems by drawing on insights from a variety of disciplines, including architecture, sociology, and environmental psychology. The framework lays a strong focus on the necessity of designing social areas that cater to the requirements of senior persons and encourage connection with the larger society.

To achieve this, the framework considers a variety of architectural characteristics, such as public space, thermal comfort, and outdoor space, which are the independent variables of the study, and the formulation of good placemaking ideas that improve social interaction between elderly people, which is the dependent variable of the study. This research attempts to offer a complete strategy to construct public housing that is optimized for the requirements of senior inhabitants by incorporating these many criteria into a coherent framework. By giving them access to safe, comfortable, and socially stimulating living places, the framework seeks to improve the living circumstances of senior inhabitants of public housing.

METHOD

Data collection for the study is done using a quantitative survey method or design. The public housing area in Sri Selangor was chosen for this study's chosen region of research, with the goal of examining the aspects that contribute to elderly-friendly placemaking and enhancing it by offering architectural recommendations. The opinions of the senior citizens of Sri Selangor were gathered using a survey technique for data collecting. In the Sri Selangor housing area, which served as the study's overall population, there were a total of 80 senior residents. Age 60 and over is the cut off for Malaysia's definition of the elderly or senior persons. Sixty individuals were chosen as the sample for this study from a total of 80 senior citizens of Sri Selangor using a random selection methodology. Only the 60 samples of senior inhabitants who could be reached and were willing to take part in the study were contacted, thus a standardized questionnaire was delivered to each of the 60 elderly individuals. The two local administrations in that state were contacted for information regarding the senior people of Sri Selangor's housing area.

Azika (1991) asserts that the universe or population of all the components under consideration in any field of study. An exhaustive inventory of every item in a population is obtained through a

census enquiry (Antic, 2019). Samples are defined as a few chosen subsets of the population that are utilised to represent the entire population for the research, according to Abdul Aziz and Ahmad (2017), sampling is the process of selecting samples using a systematic statistical procedure and guiding principles. The study will be using probability sampling because simple random sampling is more accurate in this study and that enables the selection of participants based on specific characteristics relevant to the research topic, ensuring that the sample represents individuals who can provide valuable insights and information.

Around 80 persons who reside in Sri Selangor's public housing area are among the study's population of senior participants. It can be costly, time-consuming, and difficult to conduct a survey that includes the whole population under consideration in big or unknown communities. Based only on information provided by the state's local authorities, the researcher primarily concentrates on the elderly citizens who can be reached. To get consent from the senior subjects in each sample for participation in the study, the researcher individually contacted each sample. Family members of the senior residents assisted them in filling out the surveys using Google Form after they were distributed to respondents via that platform. Many older people over the age of 60 are not familiar with technology, including Google Form, therefore they needed assistance. By considering this criterion, the sample size for this study is reduced to only 60 individuals, including a few old individuals who live alone in this Seri Selangor housing area without the assistance of family or technology.

As a formality of the survey study, personal emails inviting each of the 60 senior citizens who had been chosen to participate in it to contact their family members and engage in the survey were sent to their mobile phones. They were also emailed links to the Google Form questionnaire after that for them to complete. All 60 samples, or respondents, who were contacted for the study, provided complete responses to the questionnaire.

RESULT AND DISCUSSION

The questionnaire findings in Table 1 show that the respondents expressed dissatisfaction with the accessibility of public places in their neighbourhood. The standard deviations for these responses were relatively low, suggesting consistency among the respondents' perceptions. Overall, the findings indicate a need for improved placemaking to enhance social contact in Sri Selangor and address the concerns raised by the respondents.

Table.1 Descriptive Statistic (IV: Public open space)

	1	2	3	4	5	Mean
	Frequency					
I like social events or activities and been interested in participating in.	-	-	-	5	55	3.32
There are barriers that prevent me from participating in social events or activities.	-	1	2	1	66	4.42
There are enough common areas or gathering spaces within the public housing community to facilitate social interaction among residents.	-	3	5	5	47	3.04
The cleanliness and maintenance of common areas in the public housing community is not satisfying.	-	-	-	-	60	4.22
The accessibility of public spaces within the residential building for elderly residents, particularly those with mobility issues is no good.		2	8	5	45	4.35
I think that having more intergenerational activities such as events that bring together both younger and older residents would benefit the community.	-	-	15	10	35	4.23
The access to health and wellness resources within your public housing community is not good.	-	8	3	4	45	3.71

Source: Author

Table 2 provides descriptive statistics for the second independent variable, which is thermal comfort, based on the responses to question four were consistent among the respondents, with average standard deviations below 1.00. The second-highest mean response of 3.46 was for the question "It is important for me to have access to comfortable temperature settings in the common areas of public housing community." The relatively low standard deviation of 0.893 suggests that thermal comfort is a significant concern and that placemaking needs to be revised to address this issue.

Table.2 Descriptive Statistic (IV: Thermal Comfort)

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Mean</i>
	<i>Frequency</i>					
I am not satisfied with the temperature control in the common areas of public housing community.	-	-	5	15	40	4.03
The temperature in common areas is generally too hot.	-	-	-	-	60	4.50
I have avoided spending time in common areas due to the temperature being uncomfortable.	-	-	3	6	51	4.20
I believe there should have changes that could be made to the cooling systems in the common areas to improve thermal comfort for residents.	-	-	2	3	55	4.45
It is important for me to have access to comfortable temperature settings in the common areas of public housing community.	-	1	4	3	52	4.18
In common areas i feel that the temperature is particularly uncomfortable.	-	-	-	1	59	4.32
Have you ever experienced any health problems or discomfort as a result of the temperature in your unit or in common areas?	-	-	-	3	57	4.69

Source: Author

Table 3 displays the descriptive statistics for the third independent variable, this highlights the need for architectural improvements and the implementation of standards in Sri Selangor's placemaking to address the current lack of diverse outdoor amenities. The standard deviation (SD) of the responses, ranging from 0.808 to 0.772 on average, was less than 1.00, indicating that the respondents' perceptions were relatively consistent with each other. Overall, the findings suggest that the respondents generally strongly agreed that access to outdoor space influences their social interactions in the local community.

Table.3 Descriptive Statistic (IV: Outdoor Space)

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Mean</i>
	<i>Frequency</i>					
I often like to see the outdoor spaces such as courtyard, garden, patio in my public housing community.	-	1	10	9	40	4.35
I am not satisfied with the variety of outdoor spaces available in my community.	-	4	4	6	48	4.23
There are outdoor spaces that i feel are underutilized or could be better utilized for social interaction among residents.	-	10	8	20	22	3.32
I often felt uncomfortable or unsafe in an outdoor space of the community.	-	-	-	-	60	4.42
There are outdoor spaces that I would like to see added to my community in order to facilitate social interaction among residents.	-	2	3	5	50	3.04
I have ever participated in any outdoor activities or events organized by the community.	-	-	-	2	58	4.20
I feel that there is adequate seating and shade in outdoor spaces for residents to gather and socialize comfortably.	-	-	-	-	60	4.23

Source: Author

Table.4 Summary of the Main Findings

<i>Hypotheses</i>	<i>Accepted</i>	<i>Rejected</i>
Hp1: There is a significant relationship between public space facilities of elderly and their social interaction.	√	
Hp2: There is a significant relationship between thermal comfort facilities of elderly residents and their social interaction.	√	
Hp3: There is a significant relationship between outdoor space facilities of elderly residents and their social interaction.	√	

Source: Author

The research findings emphasize the importance of public space facilities, thermal comfort facilities, and outdoor space facilities in the housing area of Sri Selangor. These amenities are essential for enhancing social interaction among the elderly population. By improving the design and availability of public spaces, ensuring optimal thermal comfort, and creating inviting outdoor areas, the housing environment can promote greater social engagement and connectivity among older residents. It is crucial to prioritize the development and maintenance of these facilities to create a supportive and inclusive living environment for the elderly in Sri Selangor.

The study's findings highlight the need to improve public space facilities in Sri Selangor's public housing area to enhance social connections among the elderly. Currently, there is a lack of high-

quality public spaces in these housing complexes, with poor management and maintenance being common issues. To create a sustainable housing environment, it is crucial to prioritize the development of well-designed public spaces that connect residential neighbourhoods with other urban activities. This can be achieved through the implementation of safe pathways, cycle routes, and vegetation that encourage walking and cycling. Additionally, public areas should be designed to cater to a variety of people and activities throughout the day, promoting social interactions between seniors and children. Features such as cafes, play areas, and communal spaces can be incorporated to make public spaces more inviting. Ensuring that public facilities offer good visibility and informal surveillance can help older individuals feel safer and encourage their use of these spaces. Utilizing the perimeter of public areas for seating, incorporating low walls for definition, and creating a clear boundary between public and private spaces without imposing barriers can further contribute to a sense of safety and encourage elderly residents to engage with their surroundings.

Thermal comfort is an important aspect that needs to be addressed in the public housing community of Sri Selangor, particularly for elderly residents. The study's findings highlight the significant correlation between thermal comfort and social engagement among the elderly. To improve thermal comfort, several guidelines can be followed. For row houses, site planning should consider solar protection and natural ventilation, with houses facing north, northeast, southeast, or south to receive optimal sunlight. Shading devices should be provided for houses facing east, southwest, northwest, or west to ensure solar protection. Additionally, insulation in roofs and ceilings can greatly contribute to thermal comfort, while options such as roof stack installations or attics can serve as buffer zones. Occupants should have control over the building's operation, including opening windows or using air conditioning, considering outdoor conditions and room occupancy. Night ventilation and the use of mechanical ventilation, such as ceiling fans, can also enhance indoor conditions. Overall, these guidelines aim to create a comfortable and energy-efficient housing environment that promotes social interaction among elderly residents in Sri Selangor.

Improving the outdoor areas in Sri Selangor's public housing community is crucial based on the study's findings, which highlight the strong connection between outdoor spaces and social participation among elderly residents. Spending time outdoors can greatly benefit the physical and mental well-being of older individuals. However, age-related limitations can hinder their ability and desire to venture outside. Therefore, it is important to assess and enhance the design elements and usability of outdoor spaces in Sri Selangor to promote the engagement and enjoyment of older residents. The design of walkways should prioritize accessibility, providing enough space for wheelchairs and maintaining a flat and smooth surface. Surrounding paths with natural features, such as plants and flowers, can enhance their appeal and encourage usage. Additionally, incorporating seating areas near scenic spots and walkways can create opportunities for social interaction among elderly residents. A well-designed garden can also foster a sense of community and encourage physical activity. Considering these factors and ensuring that outdoor areas are easily visible and accessible from indoor spaces can contribute to creating inviting and inclusive outdoor spaces for the elderly in Sri Selangor's public housing community.

CONCLUSION

Table.5 Recommendations for Enhancing Social Interaction of The Elderly In Perumahan Awam Sri Selangor.

Problems	Proposed Architecture Design Strategies.
Public space facilities.	Multi-functional space design
Thermal comfort facilities.	Biophilic design
Outdoor space facilities	Intergeneration play space

Source: Author

Based on table 5 multi-functional spaces enhance interaction and connection among the elderly and the community by providing versatile areas for socializing, learning, and recreation. These spaces promote social interaction, intergenerational engagement, and overall well-being. An example is Pixeland in Mianyang, China, which creatively combines outdoor installations to

create a visually captivating environment that fosters social interaction and shared experiences. Multi-functional spaces empower the elderly, promoting a sense of belonging and enjoyment within the community.

Biophilic design integrates elements of nature into the built environment to enhance thermal comfort and promote interaction among the elderly and the surrounding community. By incorporating natural ventilation, using sustainable materials, and maximizing daylight, biophilic design improves indoor comfort and reduces energy consumption. The inclusion of greenery, natural textures, and outdoor views creates visually appealing spaces that promote well-being and encourage social interaction. Biophilic design principles can also be applied to outdoor areas, such as incorporating comfortable seating and shading elements, to create inviting spaces for socializing and connecting with nature. Overall, biophilic design fosters a sense of tranquility, promotes positive social interactions, and contributes to a more inclusive and vibrant community experience.

Intergenerational interactions between older adults and younger generations have been recognized for their positive impact on health and well-being. Engaging in activities across age groups improves physical health, mental well-being, cognitive function, and social relationships for older adults. Encouraging connections with younger individuals allows for the sharing of wisdom while benefiting from their energy and perspectives. Initiatives promoting intergenerational play, such as co-located facilities and inclusive fitness equipment, have gained momentum worldwide. These efforts aim to foster interaction and skill development among different generations, creating stronger communities that value diversity and promote vitality.

The researcher provided the social interaction setting of a typical senior resident in a public housing area of Sri Selangor after first understanding the elderly residents' social interaction from a comprehensive perspective. The researcher then developed and put into practice three interactive architectural guidelines, all of which were based on the daily activities of older inhabitants. The following might be used to sum up design considerations for fostering social contact and wellbeing among older individuals. (1) Providing more senior citizens with access to public spaces, encouraging them to socialise, and utilising their strengths in group dynamics. We should encourage their subjective initiative and boost their self-confidence in order to expand their existing social networks. (2) While promoting social behaviours should be subliminal, the design should accommodate (thermal comfort) the elderly's lifestyle preferences by blending into their daily activities. (3) Making the design sustainable by including all stakeholders' duties fully and improving their outside space. Other design instances contained within the framework may be investigated in subsequent study, such as the previously stated social interaction with friends.

The design of housing facilities in Sri Selangor needs improvement to cater to the needs of older people and prioritize their interactions. Local authority should incorporate specific design methods that consider the elderly when engaging construction companies for public housing projects. Key suggestions include ensuring easy access to parks and open spaces, providing safe and well-connected pathways for elderly walkers, and considering the proximity of age-friendly open spaces to aged care facilities. Local government should collaborate with transport providers to develop routes for accessing open spaces and provide special transport for specific events in these spaces.

ACKNOWLEDGEMENT

I would like to express my sincere appreciation to Associate Professor Ts. Dr. Mohd Zairul bin Mohd Noor for his invaluable guidance throughout my academic journey. His unwavering support and expertise have been instrumental in shaping my knowledge and understanding of the subject matter. Professor Mohd Zairul's dedication to teaching and commitment to excellence have consistently inspired me to strive for greater heights. His insightful feedback and constructive criticism have played a pivotal role in refining my research and analytical skills. I am truly grateful for his patience, mentorship, and the countless hours he has invested in nurturing my academic growth.

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AN INVESTIGATION TO DEFINE FUTURE SAFE PLACE SHELTER DESIGN FOR WOMEN IN KUALA LUMPUR

Yee Pei Wen, Wan Srihani Wan Mohamed

ABSTRACT

Domestic violence has seen an increase in reported cases in the past years in Malaysia with COVID-19 playing a major role in exposing the level of tolerance Malaysians have towards Domestic Violence. It is stated that Domestic Violence is one of the top 3 major reasons for homelessness in Malaysia, making women more vulnerable. Shelter homes with safe places were introduced in 1994 by the Malaysian government authorities to safeguard these women in need. However, the collected number of users in shelter homes has a drastic difference in comparison to the reported cases of domestic violence. This exposes the issues that current safe place shelters have with its approach in design and provision. Therefore, this dissertation aims to define safe place shelter design that is acceptable and suitable for women in Kuala Lumpur. This research focuses on the questionnaires survey on the perception on What are the Future Safe Place Shelter Design that can be defined for Women in Kuala Lumpur with additional information form interviews from stakeholders and study from shelters in other countries as the qualitative basis to identify themes and principals to construct the questionnaire. Hence, both qualitative and quantitative methods are applied with focus on the qualitative results. By finding the factors and variables of safe place shelter approaches, results were used in formulating a list of strategies and design guides recommendations for future Safe Place Shelter design that is acceptable and suitable for women in Kuala Lumpur in a form of domestic violence one stop support center. Future research can look into adding more variables to the existing study.

Keywords: Shelter; Domestic Violence; Healing; trauma-informed; safe place; public participation

INTRODUCTION

Domestic Violence, also known as Intimate Partner Violence is a pattern of violence, abuse, or intimidation used to control or maintain power over a partner who is or has been in an intimate relationship as stated by the Women's Aid Organization. Violence in domestic abused includes, but is not limited to, physical intimidation, emotional abuse, isolation, victim-blaming/gaslighting, patriarchal abuse, economic abuse and sexual abuse (WAO, 2022). Such abuses lead to serious consequences to society as a whole, especially for women. Domestic violence against women not only harms them physically but also mentally and emotionally. These levels of harm bring on not only physical injuries but also the habit of harmful coping methods that leads to addiction and death. (WHO, 2013) If not death through homicide from the perpetrator, women may suffer in silence leading to suicide or overdoses on drugs.

This is made worse during covid-19 and is proceeding even into the times of post covid-19 pandemic of 2022. An open letter by The New Straits Times reports that according to the Women, Family and Community Development Ministry, the number of domestic violence cases increased by 42%, from 5,260 in 2020 to 7,468 cases in 2021. With *MalaysiaKini* stating in 2015 that it is estimated that 80% of domestic violence cases go unreported. In 2019, in the Journal No Visible Bruises, the author states that domestic violence is often seen as "private violence". That even the World Health Organization deemed it a "global epidemic" yet many still believes it doesn't have anything to do with them (Snyder, 2019). The author further discusses that there are many stigmas that victims of domestic violence have to face which are, unfortunately, similar to those that still exist and is being discussed even today in Malaysia. From thoughts that categorize domestic

violence as a private matter to dismissing victims as victims of abuse if they don't leave the abusive relationships, as a community, we are actively ignoring and indirectly victim blaming. (Gracia, 2004)

In Malaysia, such shelter homes are currently only a short-term intervention, and resettlement services for domestic violence are not yet established in Malaysia. According to Jabatan Pembangunan Wanita (JPW), shelters often provide stay up to 3 months unless authorities give special orders to extend. Other formal interventions such as financial aid, empowerment talks or skills training are seldom and has low impact. This is due to community unawareness in providing aid to such organizations for women as reported in Free Malaysia Today 2022. Furthermore, when these domestic violence survivors are removed from the shelters, they face another level of difficulties such as no financial backup, safe shelter or reliable childcare in addition to familial abandonment in some cases. Many cases of survivors that come out of shelters just to return to perpetrators, or live in their family's house where the perpetrator finds them. Causing the unending loop to repeat itself (Anderson & Saunders, 2003).

Despite the Domestic Violence act 1994 being enacted to ensure that the women are protected by law and is assisted by the authorities, women's Aid Organization (WAO) reports that shelters are shown to only have housed around 4% of victims since in 2016. Jabatan Pembangunan Wanita (JPW) stated that there are 43 government shelters available but in 2016 PSPK documented only 202 victims where in such safe place shelters, contrasting the 5796 DV reports that the PDRM received. This shows a clear underutilization of Safe Place Shelters and services in Malaysia. The issue of increasing numbers of domestic violence cases is in mismatch with the underused of domestic violence shelters provided in Malaysia.

Problem Statement and Research Gap

Even though the current Safe Place shelters in Malaysia are insufficient as compared to the reported cases by the PDRM, shelters are often underutilized as seen by the statistics given by JPW. It is troubling to think that there are resources, there is a need, yet, there is not execution. There is the consideration of "hidden homelessness" that comes into the mix. Hidden homelessness is a state of homelessness that is not seen from statistics and services due the situation being handled informally (Fitzpatrick, Hal, & Bramley, 2018). Some cases of informality handling homelessness for these women who are facing domestic abuse would include couch surfing, staying temporarily at homes or their relatives or friends, even some that choose to be on the run for a few days. These temporary forms of escapes common return these victims back home with the perpetrator, stuck in a loop of abuse and turmoil (Anderson & Saunders, 2003).

Besides that, to be able to reach a shelter itself poses as a difficulty for the victims too. Needing a third party involved such as police, welfare officers, health care professionals and first line respondents to first filter through victims that seek help. This makes it difficult for victims to receive immediate help and some even being denied help as these first line respondents often time don't know or are not trained to be sensitive to such reports or signs of abuse when performing service responses (Nikolova, 2021). Not to mention the minimization and disregard that police officer implies when victims come to lodge reports of domestic abuse (Tucker, 2013). Standing as a barrier for the victim's ability to access the services prepared for them such as clinical care, shelter homes and aid. These Safe Place shelters in Malaysia shows a strong resemblance with the 1993 Journal, *In Support Of A New Life: A Shelter For Victims Of Domestic Violence*, by Ben J. Refuerzo & Stephen Verderber. Their approaches include having elements of being closed off and hidden as a form of security matching the take of "undisclosed location" by local safe place shelters (Refuerzo 1993). The shelters in the Journal further shows facilities for victims to utilized as if in a normal residential house. Which directly translated to the shelters in Malaysia that consist mainly of repurposed and renovated housing, usually in guarded communities. (WAO, 2016) This approach actually may have issue in approach as the victims that leave these abusive homes are actually introduced back into a similar environment that can be triggering (Kolk, 2015).

Hence, there is a need to identify the considerations and ways shelters can be improve the current Safe Place Shelter design approaches in Malaysia, an update; to understand the lack of awareness from the community; the disconnect between the women and shelter; identifying ways to improve and meet the needs that the current times possess for women and children suffering from Domestic Violence. Hence, this study hypothesizes that an investigation in defining future safe place shelter design for women in Kuala Lumpur will benefit the development of an architecturally and environmentally cohesive Domestic Violence Support Centre that will be the link between the current disconnect between Survivors of Domestic Violence and Safe Place Shelters in Malaysia.

Hence, the objectives of this study are as follows:

1. To investigate the current approach and limitation of Safe Place Shelters in Malaysia.
2. To identify possible future design approaches to Safe Place Shelters in Malaysia.
3. To collect perspectives of Malaysian women towards the possible future design approaches to Safe Place Shelters.

Literature Review

Cycle of Abuse

Domestic violence happens in a cycle. As proposed by Lenore Edna Walker, an American psychologist, who documented the Cycle of Abuse in her book *The Battered Women* 1979 where she continues to be the founder of the Domestic Violence Institute.



Figure 1.1: The Cycle of Abuse by Lenore Edna Walker
Source: *The Battered Women* 1979

“Hidden” Homelessness

The Borgan Project in 2020 stated that one of the top 3 reasons of homelessness in Malaysia included suffering from domestic violence. There are 3 main categories of homelessness: 1) Primary homelessness which is experienced by people without conventional accommodation; 2) Secondary homelessness is experienced by people who frequently move from one temporary shelter to another; and 3) Tertiary homelessness is experienced by people staying in accommodation that falls below minimum community (Mackenzie and Chamberlain's, 1992). The United Nations categorizes these mainly under two groups: 1) Primary homelessness or rooflessness, which include persons living in the streets without a shelter that would fall within the scope of living quarters; and 2) Secondary homelessness, which include persons with no place of usual residence who move frequently between various types of accommodations such as shelters and institutions for the homeless (Ghee & Omar, 2015). In the case for victims of domestic violence, it eventually leads victims into a state of 'Hidden' Homelessness (Spring Rescue Mission, 2018). This state of hidden homelessness is under the UN category of homeless under Secondary Homelessness. This is where individuals who live with others temporarily without a permanent home, suffering in silence, and, in many cases, will eventually lead to victims returning to abusers.

Safe Place Shelter

There are 2 types of shelter categories when it comes to Safe Place shelters, one is a “Closed-Shelter”, which is more commonly used in Malaysia, and Open- shelters. In the case of a closed shelter, a more secure and private approach is prioritized (Verderber, 1993). This is how typical safe place shelter used to approach shelter design, location and approaches. Using this idea of privacy and security to protect the victims and the shelters. In the Domestic Violence Shelter Toolkit WAO & In Support of a New Life: A Shelter for Victims of Domestic Violence prepare in 2016, WAO chooses to maintain a closed shelter approach with the occasional shelters for child care so that children are allowed to leave and attend schools. Deeming that this is an easier way for victims to be protected from perpetrator (WAO, 2016). Yet, there are testimonial cases from social workers saying the perpetrator are able to option the locations of these shelters and loiter outside the Safe Place Shelters, which is still unsafe for victims (Prestwood, 2010). In a qualitative study done in shelter homes in America, victims reported still feeling unsafe when staying in shelters due to paranoia. This shows that after traumatic abuse, the mind needs to understand safety clearly for the whole person to actually feel safe (Kolk, 2015).

As for the open shelters, it is rarer in Malaysia but is being studied by Women's Aid Organization (WAO) on its integration to the community, starting with a pro-bono shelter in PJ by Redha Youth (WAO, 2020). While in countries like Netherlands, open shelter safe places are already running and making an impact (Jong, 2012). This implies that both the family meetings and the individual sessions with the spouse take place in the same building, and that the women and children who reside there can receive family members or other visitors while they are there. Additionally, it indicates that the refuge is located in the same building as other social services on domestic abuse for persons who do not require housing but still require assistance (Jong, 2012).

Trauma-Informed Design

A developing idea, trauma informed design does not yet have a common definition or objectives. In any case, a definition of what trauma-informed care entails can be gathered as follows: “Design actions and implementations that support the strengths-based trauma-informed care framework that is grounded in an understanding of and responsiveness to the impact of trauma, that emphasizes physical, psychological, and emotional safety for both providers and survivors, and that creates opportunities for survivors to rebuild a sense of control and empowerment” (Hopper, Bassuk, & Olivet, 2010). Designers must approach their work with an awareness of the changes in people's mental, emotional, and physical states that trauma can create and take conscious action to mitigate these negative impacts when adopting trauma-informed design solutions. It is important

to understand that built environment design is not a cure-all on its own. The overarching objective of trauma-informed design is to enable a ‘wraparound’ healing environment that combines the built environment itself with training, therapies, and other activities that provide assistance to those in need (American Association of Children’s Residential Centers, 2010).

Design that takes trauma into account is crucial because it may aid in reducing the intense emotional stress or tension that a person is experiencing. Lowering these numbers increases the chance for people who have endured trauma to successfully go on with their lives. Because of the nature of their circumstances, people who are undergoing trauma are frequently understandably distracted, sometimes needing to use their mental “band width” to find their next meal or a dry place to sleep that night (Jill Pable, 2020). An accommodating, considerate atmosphere might give someone the space and comfort to stop worrying about urgent issues related to survival and start thinking about and making plans for improving their circumstances. In this approach, an interior setting might give individuals psychological “breathing room” so that they can plan their future more skillfully. In order to make clients and staff feel more secure, trauma-informed environments may lower the incidence and frequency of coping behaviors like emotional outbursts. These settings may also lessen the possibility of traumatization. By adhering to the principles of trauma-informed treatment, trauma-informed design’s implementation in architectural projects may also aid to enhance results for mental health and drug misuse behaviors (SAMHSA, 2014).

METHOD

The research is using a mixed-method, which combines a qualitative and quantitative approach. The interview approach, including participant selection and interview protocol, is used. Document review study approach and provided a list of various women’s shelter approaches from various countries. For the quantitative approach, it covers the questionnaire survey method, going into the preparation of the questionnaire, how it was administered, and what the target audience and sample size were.

Qualitative approach:

The study used a qualitative approach, firstly by exploring through interviews, the issue that safe place shelters are facing, the gaps in the system as well as the Safe Place Shelter experience in Malaysia. The in-depth interviews follow a set of questions and is conducted with relevant authorities, stake-holders and social workers from relevant organizations in Malaysia. The selection of the companies and organization was based on their expertise, practice and involvement with Safe Place Shelter.

Secondly, a comparative analysis of multiple case studies was conducted between international and local Safe Place Shelter Approaches. Identifying approaches, design principals, factors, themes and issues. Information on these practices was supported through articles, journals reports and company’s websites.

Table 1.2: Interview Respondents

Source: Author

Organization	Organization Role	Interviewee Role
JPW	Overseas the provision & organization of Safe Place Shelters in Malaysia	Social Worker
PTGKL	A GOV homeless shelter and one stop center.	Shelter Officer
NGO Safe Place Shelter A	NGO Shelter Home for Abused Women & Children, PJ	Head of Shelter
REDHA Youth	The Real Estate and Housing Developers’ Association Youth Malaysia that was involved in pro-bono Safe Place Shelter build	Architect

Table 1.3: Interview Protocol.

Source: Author

Name of researcher: Yee Pei Wen Research Title: An Investigation to Define Future Safe Place Shelter Design for Women In Kuala Lumpur Time: 00:00 Duration of interviews: 30 mins - 45 mins Interviewees: 2 Social worker; 3 Shelter Officer; 1 Architect			
Introductory The purpose of the interviews is to investigate and understand the current situation of Safe place Shelters in Malaysia, particularly the user experience, environmental aspects, thoughts on trauma-informed design, safety and surveillance, community engagements and main issues faced.	Deductive	Gender Position Experience	
Sub Research Question 1 What are the current approach and limitation of Safe Place Shelters in Malaysia? To investigate the current approach and limitation of Safe Place Shelters in Malaysia.	DC 1.1: Entry & accommodation to Safe Place Shelter	IQ 1.1: What is the current entry and stay in Safe Place Shelters like?	Probing question 1 - User experience
	DC 1.2: Suitability of Current Safe Place Shelters	IQ 2.1: How are the safe place shelters built to accommodate residents? IQ 2.2: What are the limitation and issues face due to this method of built?	- Built Environment Aspects - Community Engagement
	DC 1.3: Trauma Informed Design Suitability	IQ 1.3: What are the opinions on Trauma Informed Design & its suitability to Shelters in Malaysia?	- Trauma Inform Design

Table 1.4 : Table shows 6 nos. of design guideline/ handbook/ requirements for Safe Place Shelters were selected

Source: Author

	Design guideline/ handbook/ toolkit	Organization	Country
A.	Oranje Huis / Orange House	Blijf Group	Netherlands
B.	Building Dignity Design Strategy for DVS	WSCADV	USA
C.	Design Guidelines for Women's Safe Homes	BC Housing	Canada
D.	Handbook for Women's Shelter	Garden of Hope	Taiwan
E.	Design Guide for Refuge Accommodation	UTS DV Committee	Australia
F.	Domestic Violence Shelter Toolkit	KPWKM / WAO	Malaysia

Based on the category and country of the listed Women's Shelter Design guideline/ handbook/ toolkit, the comparative analysis of the document review is group into 4 sections under the topics:

- i. Locality & Disclosed Address
- ii. Building Type/Form
- iii. Spatial Quality
- iv. Space Planning/Layout

Findings from the document review studies are supported with the secondary data from the literature, articles, reports or official websites. Comparison between local and international practices were made and tabulated. The objective for this comparison was to learn about the best approach and possible methods of improvement, studying and analyzing other Safe Place approach.

Quantitative approach:

A quantitative approach was used in collecting data through a questionnaire survey. The data collected from this method is on the perspective of women towards the possible future design approaches to Safe Place Shelters in Malaysia. A selected sample is determined and filtered; whereby the sample size is chosen based on the target population; Malaysian women. The questionnaire form consisted of four main sections; i. Respondent information; ii. Knowledge on Domestic Violence; iii. Understanding and Exposure to 'Safe Place' Shelters in Malaysia; iv. Attitudes and Opinions on Different Safe Place Shelter Design Approaches. All the questions are in multiple-choice answer format.

The number of participants included in the research, that holds the data of the targeted population, in this case women in Kuala Lumpur, is targeted to have a minimum of 50 respondents. To ensure a minimum of 50 respondents that are women from Kuala Lumpur, the statistical concepts related to sampling error and confidence intervals were considered before settling on a sample size. Therefore, estimating 50% response rate, 200 (i.e. $200/0.50=100$) questionnaires would have to be sent out to receive 100 respondents sample size.

113 responses were received out of the 207 reached respondents. Close to a 50% response rate. Responses, as predicted, included as well male respondents and/or individuals that are not residing in Kuala Lumpur, which were not of the targeted population for the survey. Nevertheless, the responses were taken and used to further study and understand the results of the survey. Going back to Creswell & Creswell (2018) which stated that researchers believe that between 10 and 50 participants are sufficient and after filtering the respondent's information, 78.8% of the survey respondents were female with 55.8% of the total respondents to be residing in Kuala Lumpur. Satisfying a minimum of 50 responses of the targeted population for the survey.

The low rate of respondents from the targeted population may be due to the difficulty in limiting responses from the specific sub groups in the general public. A general collection of responses and a filtration process is required to achieve the sample size needed (being 50 min). Hence, the data from the survey will be studied from the view of the general public as well as the targeted population-women in Kuala Lumpur.

RESULT AND DISCUSSION

Discussion of Qualitative Data Results

Firstly, data collected from the interview method identified 2 main issues faced by the existing Safe Place Shelters in Malaysia. The first main issue was the lack of funding and resources. This was highlighted especially by Ms Low as she mentioned that funding and the lack of workers are great constraints when it comes to maintaining the shelter. This was similarly mentioned by other NGOs that were reached out to, stating that they can't respond to the interview due to lack of staff. The second main issue is the quality and space planning. As shown in the interview findings for all shelters, the representative seems to agree that there is a lack in recreational spaces as well as common spaces. Ms Liu and Mr Choong mentioned, during the interview, regarding the application of Trauma-Informed Design (TID) in shelters it would benefit the residents better in heal and their stay that the current shelters are lacking.

Besides that, from observation after tabulating and comparing the responses from the interviews, NGO shelters seem to be overcrowded most of the time as compared to the government shelters

where Ms Hanani answered that there was only one woman at the shelter at the time of interview at RPW Kel and Ms Liu answering only having 4 residents of domestic violent cases where women and children resided in the RPW KK in the past 2 years. A reason for this contrast can be drawn by understanding the way women can approach GOV shelters, which is through police or hospitals and referral from government officials, versus NGO shelters which has a similar route with the addition of a hotline to the NGO social workers. This confirms the literature review done on the effectiveness of frontliners that are undertrained and the attitudes of social workers that can actually be an obstacle for the women to reach the shelter, especially in cases where police turns them away (Nikolova, 2021) (San & Masidi, 2019).

Which also leads to the reasoning behind the mismatch witnessed between reported cases in 2016 vs victims receiving shelter services as mentioned in chapter 1 of this research were only 202 victims where in such safe place shelters, contrasting the 5796 DV reports that the PDRM received. Furthermore, news outlets have also been emphasizing such issues regarding police ignorance of domestic violence reports as seen in figure 4.5.1, showing that this approach is not reliable.

Cops urged to take domestic violence cases more seriously



PETALING DATU: A lawyer has said that despite the Domestic Violence Act 1984 (DVA) being in force, a more lenient approach by police on such cases is concerning, especially when there are no obvious grievous injuries involved.

Attorney Kuala Lumpur Vaidias said domestic violence is not limited to physical assault, as any type of behaviour that is intended to exert power and control over the victim constitutes domestic abuse.

KPWKM aware some police personnel refuse to accept reports of domestic violence - Rina



KPWKM is aware that some police personnel still refuse to accept reports lodged by victims of domestic violence, citing it as a family matter, said its minister, Datuk Seri Rina Harun. - BERHAYAT

PUTRAJAYA: The Ministry of Women, Family and Community Development (KPWKM) is aware that some police personnel still refuse to accept reports lodged by victims of domestic violence, citing it as a family matter.

As such, its minister, Datuk Seri Rina Harun advised victims to go to the hospital immediately and get their medical reports.

Figure 1.2: Showing news articles on the issue of police ignorance.

(Source: astroawani.com 2022 & thesundaily.my 2022)

Secondly, data collected from document review study showed through comparisons that the countries with declining/lower rate of domestic violence cases in this study are of the Netherlands and Canada (Cepeda, Lacalle-Calderon, & Torralba, 2021). Hence, referring to approaches by Canada and the Netherlands, both Design Guidelines for Women's Safe Homes by BC Housing and Orange House by Blijf Group focuses on visible shelters, purpose-built welfare facilities with trauma-informed design. These approaches have a great possibility to improve the way we approach Safe Place Shelters in Malaysia. Mainly with known locality & visibility of the shelters that can allow women to personally approach when needed without a third-party referral.

Besides that, as seen in the document review study for Building Dignity Design Strategy for Domestic Violence Shelters by WSCADV USA, having a visible shelter also allows community support in funds and goods with aids in forms of volunteers and training classes. This raises awareness at the same time. On the other hand, a purpose-built shelter can allow better spatial and living quality for residents and staff (Jill Pable, 2020). When designing such spaces, the capacity and programming needs can be complimented with possible building sustainability to lower maintenance fees while housing more survivors as mentioned in Design Guide for Refuge Accommodation by UTS DV committee Australia as well as Mr Choong during the interview session with Redha's pro-bono Safe Place Shelter Architect. Hence, all these possible approaches were listed as i. Locality & Disclosed Address; ii. Building Type/Form; iii. Spatial Quality; iv. Space Planning/Layout; and added to form the Investigation to Define Future Safe Place Shelter Design for Women in Kuala Lumpur Survey that was conducted for this research.

Discussion of Quantitative Data Results

Thirdly, data collection from survey questionnaire method on the public perception towards possible future design approaches to Safe Place Shelters in Malaysia showed results from 2 groups: i) Results from total respondents; and ii) Results from target respondents (Women in Kuala Lumpur), which were compared and used to conclude the factors to Define Future Safe Place Shelter Design for Women in Kuala Lumpur.

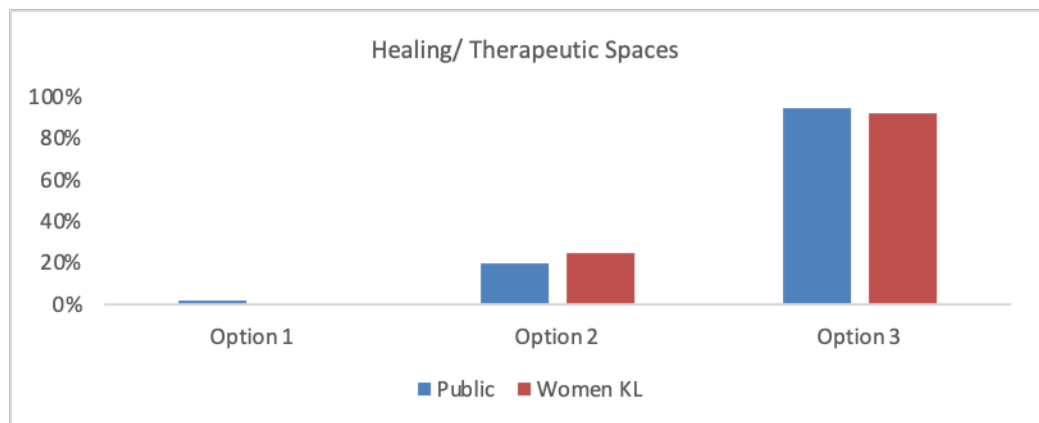
Showing the lack of awareness of *Safe Place Shelters*., Comparisons with results from total respondents on the level of exposure respondents have towards domestic violence and Safe Place Shelters show (96.5%) answered “yes” to having heard of domestic violence but (76.1%) answered “No” having heard of Safe Place Shelters. Showing the lack of awareness of *Safe Place Shelters*.



Figure 1.3: Showing data comparison.

(Source: data from Investigation to Define Future Safe Place Shelter Design for Women in Kuala Lumpur Survey 2023)

Results also differ between: i) Results from total respondents; and ii) Results from target respondents (Women in Kuala Lumpur). Respondents' preference on, ii. Therapeutic/Healing Spaces highest selected option 3 at and followed by option 2 and none selected option for women respondents from Kuala Lumpur. Reinforcing that research-based design with the proper target respondents is important for accurate results.



Option 1



Option 2



Option 3



Figure 1.4: Showing data comparison.

(Source: data from Investigation to Define Future Safe Place Shelter Design for Women in Kuala Lumpur Survey 2023)

Table 1.5: showing table of design approach to Future Safe Place Shelter Design.

Source: Author

Guide for Future Safe Place Shelter Design Approach Guide			
	Application	Pros	Cons
Locality & Disclosed Address	i.Allow for easily reachability ii.Close to amenities; hospitals; police station; public transport iii.Allow known address	Women can approach on their own with third person	Security at shelter needs to be present at all times
Building Type / Form	i.Building should embody a Women's Shelter OSSC identity ii.To accommodate women and children iii.To include building sustainability aspects	This will allow public engagement and effectiveness of the facility	Higher initial cost will be needed
Spatial Quality	i.Sense of comfort is prioritized with utilization of Trauma-Informed Design, including: - Dignity and Self-Esteem, - Empowerment and Personal Control, - Security, Privacy and Personal Space, - Stress Management, - Sense of Community and - Beauty and Meaning	Will ensure quality of spaces and encourage healing among survivors	
Space Planning (Required spaces)	i.External Physical Barrier + surveillance ii. Separated Zones iii. Flexible/ open plan layout	Ensure functionality of shelter and efficient use of resources for sustainability of shelter.	Will require professional consultation from architects and ID.
Required Spaces	Receiving and Management Office De-escalation Room Living Quarters for mother and child Third Spaces/Recreational Communal Living / Dining Child focused space Spaces for Public Engagement i. Donations ii. Training/Classes iii. Raise Awareness	Ensure functionality of shelter and efficient use of resources for sustainability of shelter.	Will require professional consultation from architects and ID.
*note: Shelter should function as DV OSSC, domestic violence one stop support center.			

CONCLUSION

The research investigation from the interviews, document review study, and survey questionnaire methods were greatly effective towards the final configuration of the Guide for Future Safe Place Shelter Design Approach. Firstly, the interviews have revealed that the need for a new approach to overcome the current gaps and issues that the Safe Place Shelters in Malaysia are facing as well as the rising domestic violence cases. Secondly, findings from the case studies have shown that different approaches can actually improve the effectiveness of women's shelter by new approaches and through new research in Trauma-Informed Design, quality of spaces can be made with intention to serve the intended purposes more effectively and efficiently. Thirdly, results from the survey questionnaire have identified firstly that researched based design is the most effective as the data contrast in some aspects from the two groups collected i) Results from total respondents; and ii) Results from target respondents (Women in Kuala Lumpur). Overall, what the targeted respondent which are the targeted demographic for Safe Place Shelters greatly resembles those of Trauma-Informed Design and also existing women's shelter approaches in both Australia and Canada. With that the Guide for Future safe Place Shelter Design Approach was configured for possible future Domestic Violence One Stop Support Centers.

For the further development of Safe Place Shelters, more research regarding current shelters and its impact can be studied. Limitations in this aspect poses as needing to constantly look for sources overseas and studying precedent from countries where cases and statistics of welfare services provided have been properly documented over the years. Due to this limitation, interviews had to be conducted with welfare officers and volunteers to get a gist of the current status and progress of shelters individually with the risk of misinformation or misunderstanding context. Status and progress of shelters and domestic violence cases are beneficial if more closely followed and documented.

ACKNOWLEDGEMENT

I would like to first and foremost express my deepest appreciation and gratitude to the respondents of this study, whether directly or indirectly, your brave experience and survival is the reason we can improve as a nation. To my research supervisor and thesis tutor, Dr Wan Srihani Binti Wan Mohamed, due to the guidance and consistent encouragement given, this investigation and study was able to get the cornerstone it needed. Thank you. I wish to also express my gratitude to our course coordinator Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd. Noor for the overseeing and assistance. Not forgetting the class that was of great support and that was of great support and camaraderie.

Lastly, and most importantly, I would like to thank my family and God for sustaining me with the very best.

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COVER LETTER FOR MANUSCRIPT SUBMISSION

Dear Editor,

I am enclosing herewith to submit the manuscript titled “AN INVESTIGATION TO DEFINE FUTURE SAFE PLACE SHELTER DESIGN FOR WOMEN IN KUALA LUMPUR” by Yee Pei Wen & Dr Wan Srihani.

It has been revised and amended according to the reviewers’ comments as seen below for further process.

Thank you for your consideration,

Yours faithfully,

YEE PEI WEN

BEYOND THE WALL: THE NEEDS OF COMMUNITY-BASED AFTERCARE HOME FOR REFORMED JUVENILE IN MALAYSIA

Chua En Hui, Mohd Zairul Mohd Noor

ABSTRACT

Social stigma towards reformed juveniles who have changed their ways is a serious issue that might impede their successful recovery and reintegration into society. To overcome this issue of overcrowding in prison, Prison Department Malaysia came out with the rehabilitation and reintegration program for young offenders, which included providing transit houses for parolees and reformed juveniles. This paper discusses the importance of transit houses with community involvement during their transitional period. This paper will also explore the suitable space planning for community-based transit house for reformed juveniles that can be planted all over townships in Malaysia. In conclusion, the paper will contribute a better method and long-term solution for the Prison Department Malaysia, Department of Social Welfare while designing the transit house for the reformed juvenile. Future research can conduct quantitative research on the community's acceptance level, reformed juveniles, and officers' opinions towards such approach.

Keywords: Social stigma; transit house; reformed juvenile; community-based facility

INTRODUCTION

The increasing number of high-profile cases involving juvenile offenders has brought attention to the issue of juvenile justice and reform. The issue has escalated and received more public attention as a result of the media's key involvement in increasing public awareness of it. This has led to a greater sense of urgency around the need for a more complete justice system to ensure that reformed juveniles are given the support and resources they need to successfully reintegrate into society. In addition to influencing public safety, this issue also affects fiscal responsibility, community well-being, and the human rights of reformed juveniles.

The juvenile prisons in Malaysia are separate from the adult prisons as the nature of treatment and needs of juveniles and adults are different. Both the JKM and the Prison Department facilities have developed education and vocational training programs to assist young offenders integrate after release. In general, the rehabilitation approach is largely based on a standardized regime of discipline, vocational training, and religious instruction. (Anderson, Kirsten; Barret, 2018)

This paper aims to address the high support needs of reformed juveniles as the vulnerable group in the community. They required more effort to access educational, social, psychological, and emotional maturity levels necessary for their transformation into adulthood. (Steinberg et al. 2004) While the successful reintegration into society is critical in reducing juveniles recidivism rates.

Aftercare programs need to be provided because the reformed juvenile will return to society. Prison Department is taking some initiatives to reduce the number of inmates inside the centre such as released them with licenses, parole program, which inmates are reintegrating into society to find works and live.

The current 13 transit houses provided by Prison Department allocated in every state of Malaysia and there is no specific center prepared for the reformed juvenile. They must grab the places with the adult offenders which inadequate to serve all. The need of reformed juvenile is different from adult, and they need more support to reintegrate back to society.

Addressing the issue of recidivism among reformed juveniles who face social stigma even after completing their sentences can be reduced through designing effective community-based transit house for them to support the reintegration into society. The research will investigate the design of community-based rehabilitation houses and current transit houses, the experiences of residents, and the needs of these programs on reintegration and community safety. The goal of this research is to reduce recidivism rates among reformed juveniles and promote a safer and more inclusive society.

By providing transit house for reformed juveniles is related to the Sustainable Development Goals (SDGs) of Malaysia in several ways. More access to resources such as counselling, job training, and community support can improve the health and well-being of these reformed youth. Most of them face various problems upon release from incarceration, including mental health issues, difficulty finding employment, and social isolation. (SDG3) Providing a safe and supportive environment for reintegrating reformed juveniles into society also reduces inequality within the country. The community-based aftercare approach also helps reduce the stigma against ex-juveniles and shortens the period of being institutionalized. Therefore, it promotes a more inclusive and fairer society. This also achieves SDG 11 and 16, which aims to make cities and human settlements more inclusive, safe, resilient, and sustainable and promote peace, justice, and strong institutions at all levels. Crime prevention environmental design creates safer and more vibrant neighborhoods that promote social interaction, physical activity, and economic growth. Reducing the fear of crime encourages community engagement and a sense of ownership over the local environment. A safe and supportive environment facilitates reformed juveniles' reintegration into society. Eliminating the bad influence and positive social interaction helps build social capital and support networks for successful reintegration.

The main aim of this study is to examine the problem in current transit houses Malaysia and identify the key considerations of spaces in community-based transit house to support successful reintegration and reduce recidivism.

Starting from stigma, there are two categories, self-stigma and public stigma. These two are always inter-related. Self-stigma has often been equated with perceived stigma. (Corrigan & Rao, 2012) It refers to the internalized negative beliefs, attitudes, and perceptions individuals hold about themselves due to societal stereotypes and stigmatization. It occurs when individuals internalize and accept the negative labels and judgments of their past behaviors or circumstances. It is also defined as the reduction in a person's self-esteem or sense of self-worth caused by their belief that they are socially unacceptable (Vogel et al., 2007) Self stigma can be a barrier to their successful reformation and reintegration. It has significant impacts on their psychological well-being, identity formation, and social integration. When self-stigma hinders reformed juveniles' self-efficacy and motivation to make positive changes in their lives, they perceive their efforts as vain and believe that society will always see them as criminals, regardless of their progress. This can lead to a sense of hopelessness and resignation, making it difficult for them to develop the necessary skills and confidence for successful reintegration.

Isolation from society due to fear of judgement and rejection will further exacerbate their feelings of loneliness and alienation. The fear of being stigmatized prevents them from seeking support, maintaining healthy relationships, and accessing necessary resources for their reformation significantly affect their social relationships and community engagement. (Link et al., 2001) Detrimental effects on their mental health and well-being which contribute to increased levels of depression, stress, and anxiety.

While public stigma usually refers to the stigmatizing perception held by the general population, where individuals who seek mental health services are viewed as undesirable or socially unacceptable. (Vogel, Wade, & Haake, 2006) This stigmatizing perception held by the general population can have profound effects on individuals' well-being, help-seeking behaviors, and overall mental health outcomes.

Community integration is important for reformed juveniles who are stigmatized by society. It usually offers them the opportunity to build positive relationships with community and others to develop a sense of belonging and access the resources and services that can improve their well-being.

Unavoidable, reformed juveniles face social stigma once they step back into the community, where discrimination and prejudice limit their opportunities to lead a normal life. (Link et al., 2001) The negative perceptions and stereotypes might lead to difficulties in securing employment, housing, and other essential needs necessary for their reintegration process. They usually will continuously face difficulty in living when they are unstable and unemployed due to their criminal record, homeless, where family members are unwilling to help, and the strict filter from the landlord. (Mohd et al., 2019) These difficulties may lead to instability, homelessness, and feelings of insecurity for the reformed juveniles. Most reformed offenders feel insecure when defining themselves within the “unfamiliar” sociocultural circumstances, even after a few years of release. (Sieferle, 2022)

The area where the impact of stigma can be felt strongly is in guaranteed employment. Reformed juveniles often face difficulties in finding suitable employment due to their criminal record. Due to a lack of education or vocational skills, limited working experience, and social stigma associated with their past involvement in the justice system, reformed juveniles encounter various challenges and discrimination in job searching and sustaining it. (Zakaria* et al., 2018) Often, potential employers hesitate to hire individuals with criminal backgrounds and biases, which can result in lower wages and reduced access to benefits.

Restoration of dignity among former prisoners should be the prior movement in the program. Prisoners' lives in correctional facilities are highly regimented and controlled by strict rules and regulations. They experience a loss of individual freedom as their movements, activities, and interactions are closely monitored and restricted. The primary purpose of this level of surveillance is to maintain order, ensure security, and prevent any potential risks or incidents within the prison environment. (Jain, 2020)

Reformed juveniles may be judged and marginalized by society, which further contributes to their dehumanization. Stigmatization involves attaching negative labels to people, which can result in their devaluation and marginalization within society. (Corrigan & Rao, 2012)

The reintegration of delinquent youth demands social support and supervision in addition to community involvement, which is more likely to reduce reoffending and increase positive outcomes. (Abrams et al., 2017) In order to urge the young person to stay on the right path, the community—including family and friends—must foster an encouraging and helpful environment. This covers emotional and practical assistance, such as finding employment or furthering one's education.

Effective social monitoring involves identifying and addressing potential risks and factors contributing to the likelihood of reoffending. These risks may include substance abuse, mental health problems, lack of education and vocational skills, and negative peer influences (Bouffard & Taxman, 2004). Monitoring these risk factors and providing appropriate interventions and support can help prevent recidivism and achieve positive outcomes for reformed youth. The involvement of professionals and stakeholders in monitoring these risk factors can gain a better understanding of the challenges that reformed juveniles may face. This allows them to develop targeted interventions and provide suitable support to address these factors and mitigate the risk of reoffending.

In addition, effective social monitoring should include setting clear expectations and boundaries for reformed youth. This includes setting rules, establishing consequences for breaking them and providing positive reinforcement for following rules and achieving goals (National Research Council, 2013). This helps them to understand and internalize acceptable behavior and facilitates their successful integration into society. Reformed juveniles work better in motivation and encouragement to make positive choices and sustain their progress.

Effective social supervision is an essential component of successful youth reintegration programmes and requires collaboration between stakeholders, including family members, probation officers and community organizations. Each stakeholder brings different perspectives and resources to the table and enabling a more comprehensive approach to social monitoring and supervision. By working collaboratively, these stakeholders can coordinate efforts, share information and ensure a holistic support system for reformed juveniles during their reintegration process.

Psychological and emotional well-being of individuals who have been incarcerated should be prioritized. They require more self-esteem and sense of self-worth when they are given back the freedom and being labeled a criminal. By focusing on restoring their dignity, rehabilitation programs acknowledge the inherent worth and value of each individual, which they are more likely to successfully reintegrate into society and avoid relapse.

The philosophy of rehabilitation continues to be embraced in the present-day halfway houses, where various interventions and programs are implemented to support the reformation of individuals. One prominent approach that has shown effectiveness is cognitive behavioral therapy (CBT). This therapeutic approach focuses on identifying and changing negative thought patterns and behaviors, promoting healthier coping mechanisms, and developing problem-solving skills. (Clear & Cole, 2000; Schwarz, 2020)

Through Cognitive behavioral therapy, reformed juveniles can address the underlying issues that may have contributed to their criminal behavior and develop various strategies to prevent relapse. By working with a trained therapist, reformed juveniles can explore and understand the factors that led to their involvement in criminal activities. Through this process, they gain insight into their thoughts, emotions, and behavioral patterns, allowing them to challenge and modify negative beliefs and develop more positive and adaptive ways of thinking and behaving. By targeting cognitive and behavioral processes, cognitive behavioral therapy equips reformed juveniles with the necessary skills to prevent relapse and maintain their progress. They learn strategies to manage stress, control impulsive behaviors, and handle difficult situations effectively. The focus on problem-solving skills helps them develop alternative solutions and make better choices when faced with challenging circumstances. Through the acquisition of these skills, reformed juveniles are better equipped to navigate the complexities of life outside the criminal justice system. (Schwarz, 2020)

In addition to cognitive behavioral therapy, halfway houses often provide vocational, educational, and employment programs as part of their rehabilitation efforts. These programs play a crucial role in supporting reformed juveniles in their reintegration journey. By offering vocational training and skill-building opportunities, individuals gain practical knowledge and abilities that enhance their employability. This, in turn, increases their chances of securing stable employment and reduces the likelihood of relapse.

Education is another important component of the rehabilitation process. By providing access to educational resources and academic support, reformed juveniles can enhance their knowledge and intellectual development. Education not only broadens their horizons but also opens up new opportunities for personal growth and success. It equips them with valuable skills that can improve their self-esteem, self-confidence, and overall well-being. (Unit, 1985)

Employment programs within halfway houses also contribute to the successful reformation of individuals. By assisting reformed juveniles in finding suitable employment, these programs offer them a sense of purpose, financial stability, and a productive role in society. Gainful employment not only provides individuals with a means to support themselves but also instills a sense of responsibility and accountability.

The integration of cognitive behavior therapy, vocational training, education, and employment programs in halfway houses creates a comprehensive and holistic approach to rehabilitation process. These interventions provide them with the skills, knowledge, and support necessary to overcome challenges, avoid relapse, and thrive as law-abiding and contributing members of society.

Malaysian Care is a non-profit Christian NGO that has been actively involved in serving the poor and needy in Malaysia since its establishment in 1979. They strongly emphasize community empowerment, pursue long-term sustainability, and regard themselves as partners with the nearby church and the people they are trying to help. The verse in Isaiah 61:1 that reads, “He has sent me to bind up the broken-hearted, to proclaim freedom for the captive and release from darkness for the prisoners...” was the inspiration for Malaysian Care.

CARE has been assisting prisoners and former prisoners since 1981. It was invited to participate in a workshop session in 2019 that was jointly organized by the Malaysian Prison Department and the Malaysian Human Rights Commission (SUHAKAM), and drafted prison reform proposals for inclusion in the 12th Malaysia Plan. This demonstrates their commitment to advocating for policy changes and improvements in the prison system to better support prisoners and former prisoners in their rehabilitation and reintegration journey.

Social services play a critical role in addressing the needs of reformed juveniles. Research has shown that social services can improve their quality of life and promote positive outcomes such as lower recidivism rates, better employment, and educational opportunities, and improved mental and physical health.

For example, a study by the National Institute of Justice found that social services such as education, vocational training and psychological support significantly reduce the risk of recidivism among juvenile offenders. Social services can also provide access to resources that help youth develop and maintain positive relationships with their families, peers and community, contributing to their overall well-being.

Accessing social services can be challenging for vulnerable and reformed youth due to various factors, such as lack of awareness, stigma and bureaucratic hurdles. However, several organizations and agencies can help connect youth to the needed services, including non-profit organizations, government agencies and community-based organizations.

The National Runaway Safeline, for example, provides free and confidential support to youth in crisis, including help finding safe housing and accessing social services. Many states have Juvenile Justice Coordinating Councils that work to improve coordination and cooperation between juvenile justice and social service agencies.

According to the article “Community-Based Interventions” by Healthy Eating and Active Living Research Core, community-based interventions are proactive approaches that aim to improve and enhance the health and wellbeing of demographic groups within a given local community. It involved forming relationships, mobilizing community resources and creating a supportive environment. (McLeroy et al., 2003) Community-based intervention is a strategy involving the community to solve social concerns and improve welfare by empowering communities to recognize and resolve issues that result in long-term change. Community-based intervention can be used in a few areas such as healthcare, education, social services, and healthcare.

One key aspect of community-based intervention is the creation of spaces that facilitate social interaction and collaboration among diverse social groups. These spaces provide opportunities for community members to come together, discuss common interests, and work towards shared goals. The design of these spaces should prioritize flexibility, allowing for various activities and uses. According to Hertzberger (2015), flexible spaces that can be adapted to different needs and purposes are more effective in serving the community. This flexibility enables community members to utilize the space according to their specific requirements, fostering a sense of ownership and engagement.

In the context of community-based interventions in mental health, incorporating spaces that promote social mixing between individuals receiving mental health treatment and the general public is crucial. Banks and Banks (2004) highlight the challenges of creating inclusive spaces that bridge the gap between individuals with mental illness and the wider community. The design should balance the need for privacy and confidentiality with the goal of promoting social integration and reducing stigma. Providing multiple spatial options within the layout of a transit

house can enhance social interaction among residents, creating opportunities for mutual support and connection. (Lovett-Dietrich, 2019)

Community-based interventions recognize that the physical environment plays a significant role in shaping social dynamics and fostering community well-being. By designing spaces that facilitate social interaction, collaboration, and inclusivity, these interventions contribute to a sense of belonging, empowerment, and social support within the community. They encourage community members to actively participate in community-building efforts and take ownership of their collective well-being.

Moreover, community-based interventions require sustained engagement and long-term casual contact among individuals working towards a common goal. This continuous interaction fosters a sense of community and strengthens social ties. The design of community spaces should accommodate this need for ongoing interaction, providing areas for socializing, group activities, and project discussions. By creating a supportive environment that encourages collaboration and participation, community-based interventions can effectively address social concerns and improve the overall welfare of the community.

Community spaces play a crucial role in preventing bad influences among reformed juveniles and the wider community by providing a platform for positive social interaction, engagement, and support. These spaces act as catalyst for building relationships, fostering a sense of belonging, and promoting healthy behaviors.

Community spaces provide opportunities for reformed juveniles to engage with community members who can serve as positive role models and mentors. By facilitating social connections, these spaces help reformed juveniles build supportive relationships and develop healthy social networks. Community spaces often host a variety of activities, programs, and events that promote positive engagement and personal development. These may include workshops, skill-building sessions, recreational activities, and cultural events. By participating in these activities, reformed juveniles have the opportunity to develop new interests, learn valuable skills, and channel their energy and talents into constructive pursuits.

METHOD

The study used a qualitative approach to gather data on the relationship between the problems in current transit houses and the key considerations of spaces in community-based transit house to support successful reintegration and reduce recidivism. The process of research involves interpreting the experience of residents in Rumah Petros, transit house managed by Malaysian Care.

Semi-structured interviews were chosen to conduct this research study. They provided more flexibility, range, and the ability to elicit more information from the subject by allowing the participants to elaborate. Semi structured interviews give participants more freedom to respond to questions as they see fit than the regular interview does, yet provide a better framework for comparison than the focused interview (May, 1997). Since the interviewer has the chance to prepare a participant before posing a sensitive question and to personally explain complex ones to them, Kumar (2005) believes that the interview is the most effective method for researching complex and sensitive topics.

Before conducting the interviews, existing literature was studied intensively. The gained insights were used as an inspiration for open questions in order to understand the purpose of transit house. Relevant theories or related themes were collected and to each of them several questions were developed. Based on these questions, an interview guide was developed which can be found in the appendix

In order to prepare fluent interviews, the questions were distributed into different categories. However, during the interviews, the order of questions in the interview guide was not strictly followed.

5 interview participants from transit house are involved in this study. Each interview conducted between 30- 75 minutes. The limited number of participants restrict the comparison.

Name	Race	Religion	Age	Sentence Status	Marital Status	Length of staying Transit house
Jeff	Chinese	Buddhism	30+	Paroler, placed at transit house 6 weeks before end of sentences	Single	4 weeks, 2 weeks more to stay
Emza	Malay	Islam	20	Free man, under AADK supervision for one year	Single	2 months
Uncle Kim	Chinese	Christian	50+	Free man, placed at transit house 2 months before end of sentences	Single	6 months
Ranjith	Indian	Hindu	60+	Paroler, placed at transit house 6 weeks before end of sentences	Married, have grandchildren	4 weeks, 2 week more to stay
Uncle Lee	Chinese	Christian	50+	Free man	Single	One year

RESULT AND DISCUSSION

Based on the finding and experience of the residents in Rumah Petros, there are important factors that can better inform the design of rehabilitation environments for ex-offenders. In fact, these have to take into consideration when preparing a rehabilitation housing as the residents can drastically affected during the reintegration. The following recommendations are based on the social environment factors deemed significant by the respondents and are targeted at spatial design in the planning stage for rehabilitation environment for ex-offenders.

1. Social Interaction

Social interactions play an essential role in reintegration. It provides opportunities for individuals to connect, build relationships, and develop a sense of community. The residents agree that the important of public spaces that should have the capacity to not only accommodate but also encourage social interaction among the residents and social workers. Having conducive public spaces allow residents to engage in conversations, share experiences, and offer mutual support to one another. These interactions contribute to the development of positive relationships and a sense of belonging, which are essential for the residents' overall well-being and successful reintegration into society. Having designated spaces where residents can engage in discussions and receive assistance from the social workers promotes a sense of trust, open communication, and collaboration.

2. Site Selection

The selection of a neighborhood-friendly site for the transit house is equally important. It ensures the transit house is integrated into the surrounding community. The integration fosters social interaction not only within the transit house but also with the broader community. It allows residents to engage with neighbors, local businesses, and community organizations, thereby promoting social inclusion and reducing the stigma associated with their past experiences. Besides, the site should has more accessible to the working opportunities which easier for the residents to commute. In other hand, the site will be also accessible for the community to access and involve in the rehabilitation process of residents.

3. Surveillance and Visual Connection

Surveillance and visual connection are essential consideration in the design of a transit house to ensure the safety and security of the residents. By allowing for maximized views, the design promotes both indirect supervision and the creation of safer spaces.

Indirect supervision refers to the ability of staff or social workers to have visual access to different areas within the transit house without being physically present in each space at all times. This form of supervision allows for monitoring and oversight of activities and interactions, promoting a safe and secure environment. Maximizing views through strategic placement of windows, glass partitions, or open layouts enables staff to have a clear line of sight and maintain awareness of what is happening in various areas.

In addition to supervision, visual connection plays a crucial role in creating a sense of safety and comfort for the residents and also public. Being able to see and be seen by others fosters a sense

of community and discourages inappropriate or harmful behavior. It promotes accountability and encourages positive social interactions among residents and public.

The design should incorporate features that facilitate visual connection, such as open common areas, transparent or translucent barriers, and unobstructed lines of sight. These design elements allow residents to have a sense of awareness and connection with their surroundings and fellow residents, reducing feelings of isolation and enhancing a sense of belonging.

Furthermore, maximizing views also has the advantage of natural surveillance from the surrounding community. By providing visual connections between the transit house and its external environment, residents and staff can benefit from the presence of potential observers from the community. This serves as an additional layer of security, as the presence of external individuals can deter potential risks and promote a safer environment.

4. Privacy

It is important to strike a balance between visual connection and privacy. Some residents are introvert and require more quiet space for book reading or writing. Adjustable design such as curtains, blinds, partitions provide residents the options to control the level of visual connection and ensure their privacy needs are respected. Some quiet rooms can be designed that cater to the need for privacy and solitude. Residents can engage in activities that require focus or personal reflection. Soundproofing measures should be considered to minimize noise disturbances.

It is important to provide residents with the autonomy to control their level of engagement and interaction. By providing adjustable interventions, transit houses can cater to the diverse needs of residents, ensuring that both social interaction and privacy are respected. This balance promotes inclusive environments where residents feel comfortable and have the opportunity to engage in activities that are conducive to their well-being and personal growth.

5. Family area

Although not much family members involve physically in rehabilitation programs in transit house due to family issues or distance, it is important to recognize the significance of maintaining connection and providing opportunities for family engagement. Designating a specific family area within the transit house can serve multiple purposes. Firstly, it provides a dedicated space where residents can interact with their family members during visits or scheduled family sessions. This area can be designed to be comfortable and welcoming, creating a supportive environment for meaningful interaction and strengthening family bonds. It can serve as a platform for family-focused activities, workshops, or counselling sessions. These sessions can help address family issues, providing guidance and support to family members, and promote healthy relationships and communication.

Some level of supervision in the family area can be beneficial. The presence of social workers can provide support, guidance and facilitate the conversation, ensure the interaction between residents and family members are conducted in a safe and constructive manner. At the same time, it is important to respect the privacy and autonomy of the families during their interactions. Families may need space and privacy to have open and honest conversations, build trust, and work through their own dynamics. Too much intrusion may hinder the natural progression of family interactions and limit the potential for genuine connections and growth. Families should take ownership of their own relationships and navigate their challenges independently. Open communication, mutual understanding, and a collaborative approach between social workers, residents, and their families can help establish an appropriate balance between supervision and privacy in the family area of a transit house.

6. Community involvement

There is not much community involvement in transit house, beside the ex-residents gathering once in a month. While it is acknowledged that there may be limited community involvement in current practices, it is essential to recognize the value of engaging the community in supporting and encouraging the current residents.

The presence of ex-residents gathering once a month can have a significant impact on the current residents. It serves as a reminder that reformation is possible and that individuals who have successfully reintegrated into society can serve as role models and sources of inspiration. The sharing of personal experiences, challenges, and success stories during these gathering can instill hope and motivation among the current residents.

Moreover, the involvement of ex-residents in the transit house community creates a sense of belonging and connection. It fosters a supportive network where individuals can find understanding, empathy, and guidance from those who have gone through similar experiences. The shared bond of overcoming obstacles and rebuilding their lives can create a strong support system that promotes resilience and positive change.

By encouraging the involvement of the community, transit house can tap into valuable resources, expertise, and networks that can support the residents' reformation journey. It creates a collaborative approach that recognizes the collective responsibility in supporting individuals to rebuild their lives and become productive members of society.

7. Outdoor activities

Residents in Rumah Petros enjoy having outdoor activities during evening time. Jogging and planting are normally carried out around neighbouring. Outdoor spaces provide opportunities for physical exercise, fresh air, and connection with nature, which is crucial for the overall wellbeing and development of residents.

When designing outdoor spaces in a transit house, it is important to consider the diverse needs and preferences of the residents. The spaces should be versatile and adaptable, accommodating various activities and interests. For example, incorporating jogging paths, sports courts and area of gardening along it can provide opportunities for residents to connect with nature and engage in therapeutic activities. Proper design of outdoor spaces should prioritise safety and accessibility. Ensuring adequate lighting, clear pathways, and proper signage promotes a secure environment for residents to enjoy outdoor activities. Engaging residents in the planning and decision-making empowers them and creates a sense of ownership and pride in the outdoor spaces.

CONCLUSION

In conclusion, the establishment of transit houses for reformed juveniles plays a vital role in their successful reintegration into society and reducing recidivism rates. Throughout the study, we explored various aspects related to transit house design and the impact on reformed juveniles.

The vulnerability of reformed juveniles required the support from social workers, families and community. Education and direct communication between the residents and the community are the key strategies in breaking down the barriers and fostering understanding.

We can see that the support structure provided by social workers, including case management, emotional support, and referrals, is crucial in ensuring the holistic well-being of the residents. Overdependence on social workers may present some concerns and limitations. The overworkload and capacity of social workers may lead to burnout and compromised quality of care. Besides, the sustainability and long-term impact of the support provided by social workers should take into consideration. While social workers can offer valuable guidance and assistance during the residents' stay in the transit house, it is crucial to continue empower the residents to develop their own skills, independence, and support networks. Building self-reliance and resilience among the residents can help them navigate challenges and maintain their progress even after leaving the transit house.

Family involvement, although not always physically present, still plays a significant role in providing stability, guidance, and support to reformed juveniles during their reintegration journey.

The social and environmental aspects of a reformed juvenile in their daily life are what determine whether the individual will be susceptible to bad exposure, for examples, from peers, family, working environments etc. which subsequently leads to drug/ alcohol addiction or violence cases.

The physical environment and facilities within the transit house should be designed with careful consideration, taking into account the needs for social interaction, privacy, flexibility, and outdoor activities. Balancing visual connection and privacy, incorporating proper surveillance measures, and creating designated family areas contribute to creating a safe and supportive environment.

Overall, the research conducted in this dissertation has shed light on the importance of transit houses as aftercare programs for reformed juveniles. By addressing the challenges of community integration, providing comprehensive support services, and creating conducive physical environment, transit houses can greatly contribute to the successful reformation and reintegration of juveniles, ultimately leading to a safer community and a more inclusive society. Future research can further explore the long-term impact of transit houses and identify additional strategies to enhance their effectiveness.

ACKNOWLEDGEMENT

The author would like to express sincere and special gratitude to Jabatan Penjara Malaysia, Samuel Lim from Malaysian Care, and the interviewers from the transit houses for sharing their experiences and invaluable participation in this study.

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REDEFINE FUTURE URBAN BUDDHIST CEMETERY: PUBLIC PERCEPTIONS AMONG FUTURE URBAN BUDDHIST CEMETERY

Kok Foon Yi, Wan Srihani Wan Mohamed,

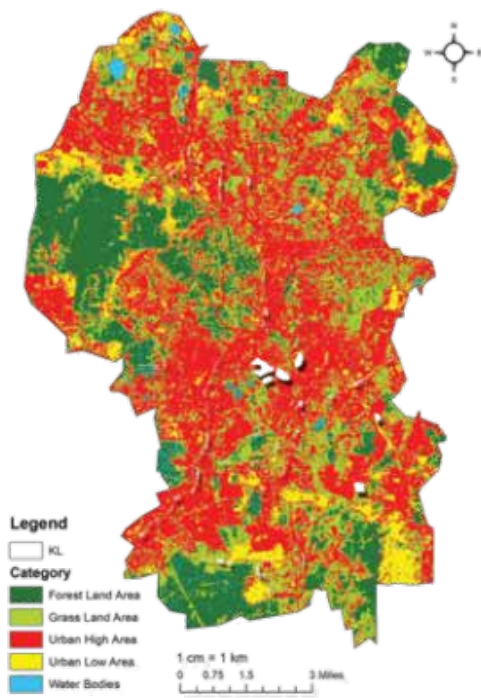
ABSTRACT

As this cohort moves into old age, the absolute number of deaths will increase significantly, as will the subsequent demand for interment spaces like cemetery. Land scarcity for cemetery has always been an issue in Malaysia due to rapidly densifying urban centres which it appears to necessitate the sacrifice of 100-year-old reserved forest for graves. While, unreasonable practice having extravagant tomb and grave site has add on the rising issue of land scarcity. Despite cemeteries being essential land-use typology in every city, however, in many planning processes, they have been largely ignored. There is a lack of design framework and planning in cemetery design. Therefore, this dissertation will redefine the future urban Buddhist cemetery in Malaysia to improve its sustainability. In this research, desk review and questionnaire survey will be conducted on the factors in redefining the future urban Buddhist cemetery, plus, to find out the acceptance level of public towards the sustainable application of green funerary culture and cemetery design. This research explores the possibilities of sustainable future urban Buddhist cemetery in Malaysia. Findings from this survey will be helpful to understand the criteria for developing the typologies of urban Buddhist cemetery that helps improving its sustainability. Future research can conduct qualitative study to look in-depth on technological advance having digital memorial, which add more variables to the existing study, having other potential architectural design and typologies.

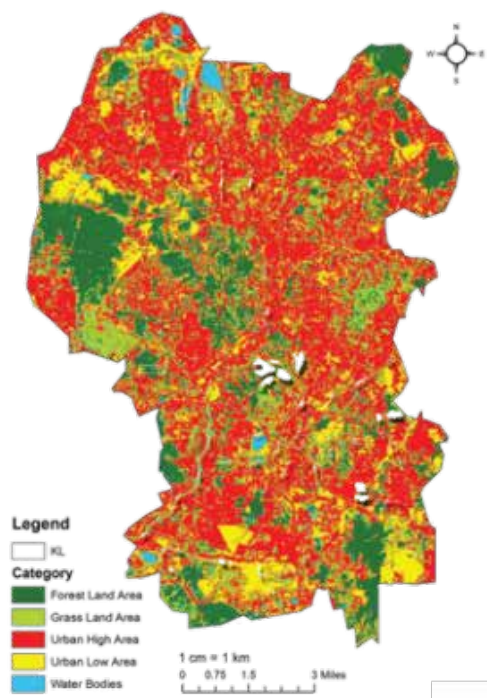
Keywords: Future Urban Buddhist Cemetery; Public Perceptions & Acceptance Level; Sustainable;

INTRODUCTION

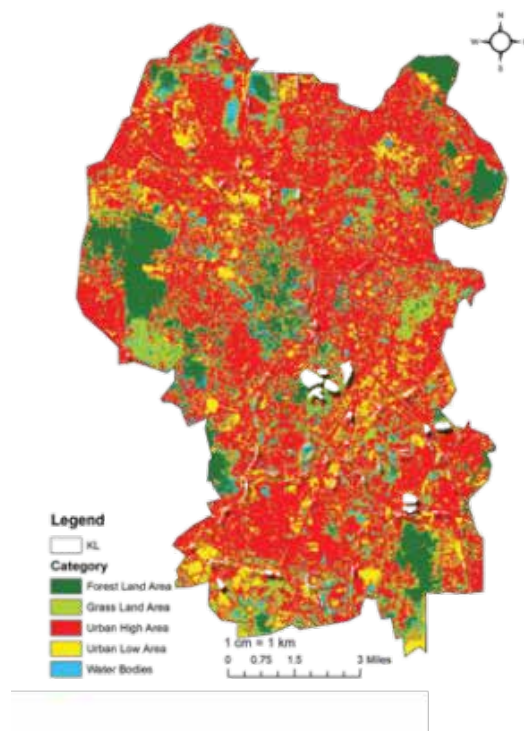
From 1980 until 2020, Malaysia population is projected to increase by 45% and is expected to increase by 80%. The number of people aged 65 years and over in Malaysia has increased steadily since the 1970s, and it is projected the number will triple from 2.0 million today to more than 6.0 million by 2040 (Statista Research Department, Sep 7, 2021). As this cohort moves into old age and faces higher mortality rates, the absolute number of deaths will increase significantly, as will the subsequent demand for interment spaces (Basmajian, 2010). Therefore, the need arises for the Malaysian government to identify new burial grounds to allow the memorial rites to take place smoothly.



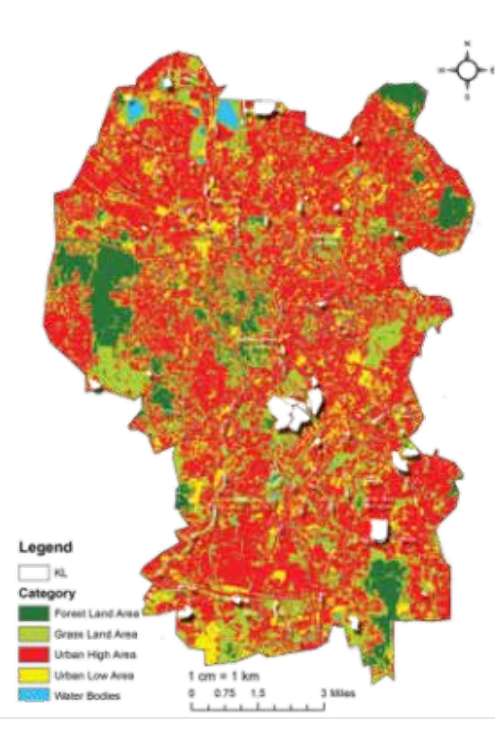
Classification map for changes
in Kuala Lumpur city of 1990



Classification map for changes
in Kuala Lumpur city of 2000



Classification map for changes
in Kuala Lumpur city of 2010



Classification map for changes
in Kuala Lumpur city of 2020

Figure 1 Land use of cemetery in Kuala Lumpur from 1990-2020, where:
Rapid urbanization occurs
Demand of cemeteries increase
Cemeteries tend to be relocated to outskirts, away from the people
Decrease in green land and deforestation occurs

Even though the urbanization caused the residential area keeps expanding, city councils are less concerned with new green open space, as well as provision for cemeteries. The current way city councils cater for burial spaces are generally based on the availability of land around the city rather than being based on the local demographic. According to the Islamic and non-Islamic Cemetery Planning Guidelines (1999), a cemetery should be located in every neighborhood, and a population of between 5,000 and 10,000 people require a land of 1-2 hectare. Meanwhile, for big cities (more than 200,000 people), the cemetery requirement is 20 hectares. (Utusan Melayu, 2012). The insufficient of land cater for the cemeteries in urban area, has caused housing developers and the government to construct residential areas near cemeteries.

The consequences of insufficient of land for burial plots has led to the rising cost of burial ritual. More land is needed to set up for cemeteries and it goes never ending. According to studies, Buddhism has the highest average price for traditional burial methods for having RM35,000 to RM50,000. Following by Christianity, which have the average price of RM3,000 to RM10,000, next is Hinduism RM 2,200 to RM 10,000, while Islam having an average price of RM 900 to RM1,600. (Malay Mail Online, 2014). The price of the burial rituals will increase in time as land space become scarce over time.

On top of that, the Buddhism cemetery is having extravagant tombs and grave site practice, compare to other religion practised, as traditionally to represent fashionable and sign of showing off, while these days wealthy people are spending big money on posh mausoleums. Tomb builders advertise deluxe models with thatched gazebos and staircases. Models shaped like couches, as was the custom in the Song Dynasty, are very popular, which this unreasonable practice have add on the rising issue of land scarcity.

Land scarcity for cemetery has been an issue in Malaysia due to increase popularization and rapidly densifying urban centers. Rapid development appears to necessitate the sacrifice and exploitation of 100-year-old reserved forest and protected land at Section 8, Kota Damansara in Selangor for graves (TheStar, 2007). Rapid urbanization and urban sprawl have severely impacted on the provision of land for burials, as (DBKL) told The Malay Mail Online that there is no burial land available in Kuala Lumpur, and that public cemeteries in the city are now 80 % full (Malay Mail Online, 2014). In addition, public are having negative thoughts towards death due to superstitious thought. Death issues is neglected and seen as an afterthought in the community planning and design profession.

Despite cemeteries are an essential land-use typology in every city, however, in many planning processes, they have not been carefully worked upon and been largely ignored. There is a lack of design framework and planning in designing a cemetery.

Moreover, two broad problems routinely encountered by cemeteries were identified through stakeholder interviews; as cemeteries age, it is increasingly difficult to maintain their physical appearance and safety, engage and manage relationships with visitors and nearby residents. (Mohamad Reza Mohamed Afla, 2012). Cemeteries that reach capacity tend to fall into disuse and disrepair (Rebecca Noble May 2018). For many cultures there has been a shift in the acceptance and visibility of death that has meant cemeteries are less visited and less integral to the day-to-day activities of society and left abandonly (Matthey et al., 2013, Jalland, 2006, Johnson, 2008, Pitte, 2004) providing buffers between the living and the dead (Rugg, 2000, Rugg, 1998, Fiedler et al., 2012).

Current conventional cemetery planning could be at best described as an afterthought with little relationship to local demand let alone social integration, while being a large piece of under used land in the city, which is expected to play more roles within the city's fabric other than accommodating for dead disposal purpose. It can be said that current cemeteries were not designed with the future in mind.

Therefore, this article explores the possible attempt to formulate sustainable strategies in redefining the future urban Buddhist cemetery in Malaysia to improve its green funerary sustainability. Cemeteries should not be seen as a waste of space, but as a part of our history & culture. In losing them, we lose little bits of ourselves. The article begins with the contextualization of theoretical frameworks regarding the issues of urban cemeteries, follow by the possibilities of urban sustainable cemetery taken considerations of religious & belief before narrowing down to the analysis based on quantitative survey.

With that, this research will contribute design strategies on sustainable future urban Buddhist cemetery to ensure their sustainability for future generations. Designing a hybrid funerary realm for the living and the dead to serve an intertwined nature of both dimensions of life that can emerge with surrounding neighborhood context and improve the engagement with the surrounding community. This research also helps on designing a new typology of cemeteries with new model of planning and land allocation in the future city. Taking in the considerations to soften the contradiction between the shortage of urban land resources and the large demand of cemeteries. Softening the loads of burden on the city with the provision of land for cemetery. Therefore, this research gives a new reference or new model to sustainable future urban Buddhist cemetery with multiple usage and function.

Furthermore, this research contributes towards public communities, as this research provides a model on designing future urban Buddhist cemetery which helps in reducing community taboo on cemetery and increase visitation rates. Additionally, increase social relevance and adding valuation, as well as positive perception to the public.

Issues of Urban Cemeteries

Urban cemeteries in Malaysia are under pressure as a result of brisk development and rapid population growth along with the densification of high-rise buildings. Burial sites are overfilling and reaching full capacity as a result of poor management to accommodate future growth. These once pristine cultural and religious place have become disconnected with the urban fabric said Joern Ryan (2018).

According to Denan (2021), traditional cemeteries not only occupy a lot of open land, said by Fan (2014) but also have significant negative impact on environment, analyze by Giovanna C.L. (2017). Studies showed that cemeteries which are in poor conditions present a potential threat that groundwater contamination is at least as high as standard waste disposal sites, according to Fisher (1994).

Denan (2021) continued that the originally creation and extensive use of cemeteries was not intended in a sustainable future during the Industrial Revolution. Nobody was thinking about wondering what would occur if the space has been scarce. In some places around the world, cemeteries are expected to be entirely inhabitable and run out over the next twenty years. It then supported by Fan (2014), a century ago, a 4ha burial ground would be fully occupied in 60 years. However, today the same area would reach saturation point in 7 to 8 years.

Typically, mentioned by Goh (2020), cemeteries were seldom planned for urban land use. They were built on fringe-belt land, usually located on the outskirts of built-up urban areas and later were surrounded by urban development, becoming gradually and naturally an integral part of urban fabric, analyze by Harvey (2006).

Today, such urban cemeteries face the dilemma of being perceived as uneconomical waste of space by Kong (2012), with low visitation rates indicating lack of social relevance, mentioned by Davies and Bennett (2016), which mentioned by Fan (2014) that the shortage of land has also compelled action to improve the image of cemeteries.

On top of that, in Malaysia, there are certain trends of development that may impinge on the existence of some Buddhist cemeteries. According to Fan (2014), serious neglect, poor conditions

and abandonment of cemeteries face the possibility of give way to other alternative uses. For example, more than 300 graves of the century-old cemetery in the northern state of Perlis, have been deserted for lack of proper management and the land has been invaded by housing development. Other example for such, the Kwong Tong and Hokkien cemeteries in Kuala Lumpur were involved in an official proposal to shift to distant sites away from the city, according to Fan (2014).

The current study shows the issues of the current urban Buddhist cemeteries, where the originally creation of cemeteries was not intended in a sustainable way for future, and there is no unified approach to the implementation for urban cemeteries. Therefore, this research will be identifying and analysing the user perceptions and needs on cemeteries, plus also focusing on sustainable application of green funerary culture.

Urban Sustainable Cemetery Taken Considerations of Religious & Belief

Today, there are ecological end of life choices such as natural green burial and other sustainable practices of death-care with the opportunity to internalize and externalize sustainability in the ecology of the urban city. Urban cemeteries can become ecological landscapes adapting to changes and integrating firmly in the urban environment, which serve an intertwined nature of both dimensions of life.

According to Fan (2014), nurturing a “green culture” of cemeteries is important for their instrumental and intrinsic values. Their instrumental value lies in serving the ends of the living for the burial of the dead, and their intrinsic value is derived from their existence in their own right and for being a cultural and necropolis landscape as the abode of the dead. Following by Song (2017), there are many innovative strategies that could build urban resilience for the cemetery, such as eco burial, tree burial, aquamation, promession, mushroom burial suite, high technology columbarium, and so on.

In conjunction with that, analyzed by Leuta (2019), incorporating green infrastructure elements and constant maintenance can enhance the ambience of the cemetery space. This visual release can enhance the visitation experience and in turn grief. In this way, the cemetery enhances ecosystem management, improves the visitor’s experience and responds to the socio-cultural needs of the community.

Additionally, the planning of cemetery land can be oriented towards multifunctional space to optimize the land use especially in urban area, mentioned by Denan (2021). By allowing the use of urban cemeteries as recreational area, the surrounding natural view and the public’s negative perception towards cemetery can be eradicated. Indirectly, a positive outlook on cemetery will increase and the adjacent area is also improved accordingly.

The land dedicated to the burial of the deceased can at the same time be conserved

as a safe and green setting to meet Chinese traditions. In fact, the demands of burial and the preservation of the environment are not contradictory but compatible with the concept of unity and human harmony, said by Denan (2021).

It was supported by Song (2017), that natural cemetery, a way of eco burial which desire to motivate environmental protection, for such decomposition of body, symbolize “returning to nature” which is the major concept of the natural cemetery that comes to the notion of nature and human unity, by Joern Ryan (2018). Hence, typically there is no grave marking such as tombstones. Instead, a rock or a tree is more appropriate way to commemorate the dead, analyzed by Song (2017).

All in all, according to Fan (2014), Chinese cemetery has not been established merely to serve a utilitarian purpose. Instead, it is a platform for the enactment of deep-rooted cultural values. Embedded in the burial culture is the philosophy of the unity of heaven and humans, mentioned by Ji Xian lin (1996), while heaven may be interpreted as nature or the environment itself. Following

with the support of Fan (2014) that the three key cultural values underlie the concept of the unity of nature and humans and are pertinent to the narrative of environmental ethics, are filial piety, yi or justice and righteousness. Together, they provide the *raison* and the operating mechanism in the sustainability of Chinese cemeteries.

The current study shows the available methods to implement urban Buddhist cemetery in sustainable way, but there is lack of supporting data on public acceptance levels and response on the proposed green funerary approach. Therefore, this research will be identifying and analysing the public knowledge on sustainable death. In addition, this research will also be identifying and analysing public responds and acceptance level on sustainable application of green funerary culture and possibilities use of urban cemetery for multifunctional usage.

METHOD

The study used a quantitative approach to understand public perception on the possibilities use of urban cemetery for other purposes and acceptance level on sustainable application of green funerary culture, in order to identify the sustainable strategies in redefining the future urban Buddhist cemetery in Malaysia to improve its green funerary sustainability.

The results of the research described in this paper are based on survey data acquired from one hundred and forty-nine (149) randomly select respondents, which the study population will be focusing on Buddhist who is practicing Buddhism religious practice, and is limited to Buddhist who lives in KL area.

Therefore, the survey questionnaire in title “Redefine Future Urban Buddhist Cemetery: Public Perceptions Among Future Urban Buddhist Cemetery” will be conducted through online platform, Google Form, which the survey questionnaire explores the Buddhists opinions on redefining the future urban Buddhist cemeteries to ensure their sustainability for future generations. Findings from this survey will be helpful to understand the criteria for developing and redefining new typologies of cemetery that create a hybrid funerary realm for the living and the dead to serve an intertwined nature of both dimensions of life.

Survey questionnaires comprise a set of questions ranging from level of agreements and the preferred event or activities happened in the cemetery. A set of questionnaires is attached in Appendix A consisted of total 20 question (including sub-question) are structured into 3 Section being questioning on:

Section A: Respondents’ Demographic and Social Background Profiles

Section B: Current Cemetery Issues Faced in Malaysia

Section C: Factors in Redefining Future Urban Buddhist Cemetery in Malaysia to Improve Its Sustainability

Section A is going to collect the social background of the respondent in the range of age, gender, and educational level. Section B is collecting data on public perceptions on the cemeteries and public responds on the current cemetery issues faced in Malaysia. This information will provide insights into the design needs and preferences on the preferred condition of cemetery. Section C are going to examine on factors in redefining Malaysia future urban Buddhist cemetery to improve its sustainability. This information will help in developing comprehensive design guidelines that address the needs and preferences of Malaysia future urban Buddhist, by gathering the data on public knowledge on sustainable death, public responds and acceptance level on sustainable application of green funerary culture and cemetery design. Moreover, Section C is collecting data public responds on the possibilities use of urban cemetery for other purposes. This information will provide insights into the multifunctional usage design needs and preferences on the preferred activities, preferred service, and preferred facilities and amenities.

Survey questionnaires comprise a set of questions ranging from yes or no questions and sought for a level of agreement. Perceptions were rated on ordinal scale devised into an interval scale ranging from Strongly Disagree to Strongly Agree from ascending order: 1 represents – Strongly Disagree; 2 – Disagree; 3 – Neutral; 4 – Agree and 5 – Strongly Agree.

RESULT

Cemetery means to me as:

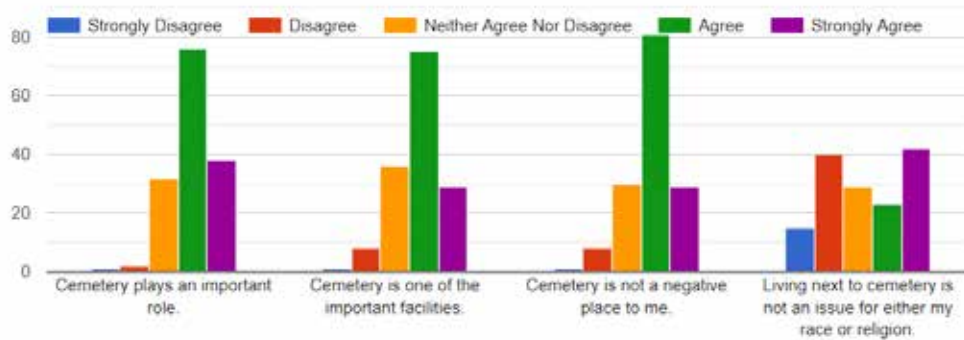


Figure 2 Levels of agreement of respondent's view towards the idea of cemetery

Source: The Author of this Article

Based on the figure above, most of the respondents strongly agree that cemetery plays an important role and is one of the important facilities to them, agreeing that cemetery is not a negative place to them. Meanwhile, there is a nearly balance, with slightly more agreement in between the respondents on living next to the cemetery is not an issue for either their race or religion, As might be expected, most of the respondents of a younger age and some from the middle age (i.e. 21-year-old to 35-year-old and 36-year-old to 45-year-old) were in favor of living next to the cemetery. (i.e. 66 respondents agrees, while 55 disagree, and a neither agree or disagree on 28 respondents.)

I am aware of the following cemetery issues:

* can be more than one options *

149 responses

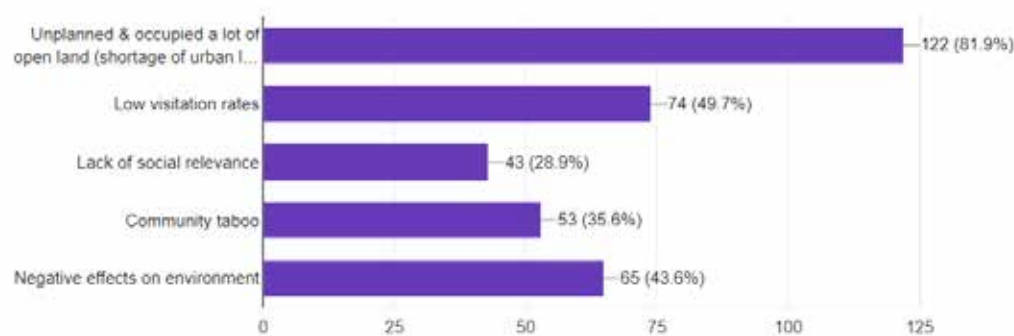


Figure 3 Levels of agreement of respondent's view towards the idea of cemetery

Source: The Author of this Article

According to figure above, there was 81.9% of respondents acknowledge that current cemetery is unplanned & occupied a lot of open land (shortage of urban land), while 49.7% of respondents admit that there is a low visitation rates on the cemetery, following by a 43.6% of respondents agree that current cemetery cause negative effects on the environment. Beside that, there is a 35.6% of respondents agrees on the issue of community taboo on the current cemetery, with another 28.9% of respondents admit on the lack of social relevance on current cemetery in Malaysia. The data reflects the realization on how the current cemetery had influence on the public in Malaysia.

I am aware of other sustainable burial methods.

149 responses

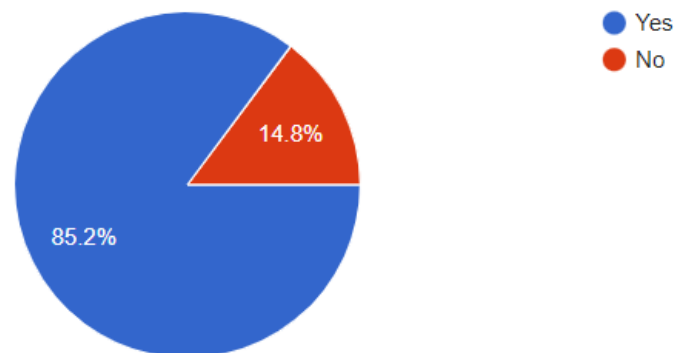


Figure 4 Respondents acknowledgement on sustainable methods of managing the death

Source: The Author of this Article

Figure above shows that 85.2% of the respondents acknowledged some sustainable methods of managing the death while 14.8% of them do not know any regarding sustainable death managing methods. According to the study, sustainable death managing methods are not applied much in Malaysia, most of them still applying traditional burial method with casket for ground burial.

Sustainable burial methods that I heard the most and can be accepted are

* can be more than one options *

149 responses

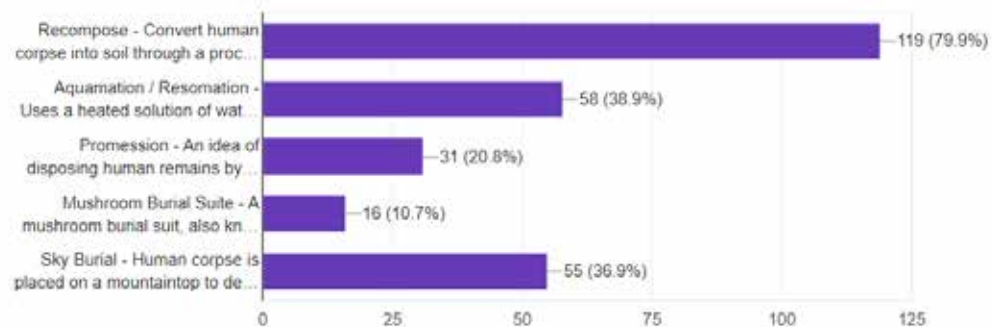


Figure 5 Most popular sustainable burial method

Source: The Author of this Article

According to figure above, the most popular sustainable death method among respondents is Recompose Burial Method, where it gently converts human bodies into nutrient-rich soil through a process known as natural organic reduction, or human composting, which this Recompose Burial Method received a total of 79.9% of the responses. This is due to the reason that Recompose Burial Method, has similar ideology of existing ground burial method used where by the bodies is return back to the earth and it is deeply connected to nature. Follow by, the second highest rank of the popular sustainable death method, Aquamation Burial Method, which it obtains 38.9% of the respondents' feedbacks.

I think there is a need to redesign the current cemetery to address the issue of lack of space.

149 responses

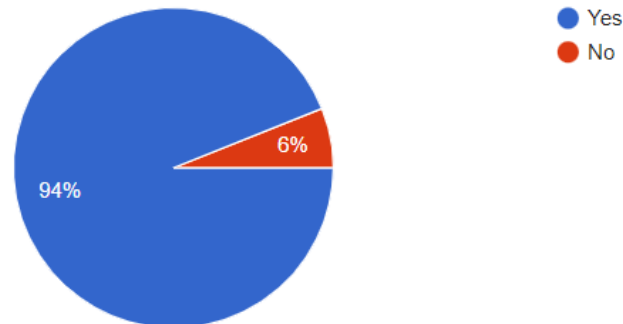


Figure 6 *Necessity in redesigning current cemetery to address the issue of land scarcity.*
Source: The Author of this Article

Figure above shows that 94% of the respondents feel that it is crucial to redesign current cemetery especially on the issue of lack of space. This shows that the land scarcity is critical and gets most acknowledgement from the public in Malaysia. Most of the respondents feel the urge to improvise current cemetery especially on the matter of traditional burial method which utilizes a large piece of urban land and is left abandonly with low visitation rate.

I can accept the innovative and sustainable approaches to burial methods as long as they preserve funeral rites and mourning demands.

149 responses

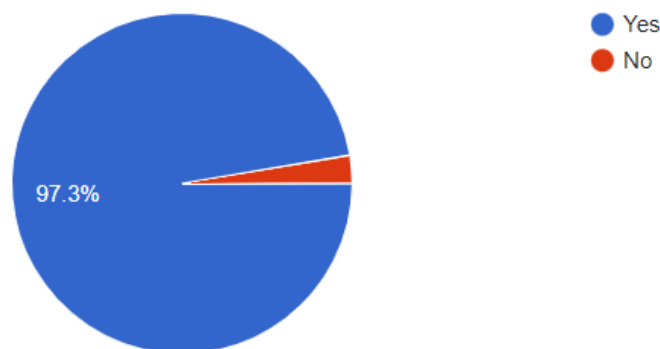


Figure 7 *Respondents acceptance level of new sustainable burial methods towards the proposed cemetery typology which preserves the funeral rites and taken in the consideration of primordial needs for mourning.*
Source: The Author of this Article

Based on the data collected above, it shows nearly most of the respondents (97.3%) can accept the innovative and sustainable approaches of burial methods if the proposed cemetery typology preserves the funeral rites and take into account of primordial needs for mourning. This shows how crucial the ritual activities and funeral rites in Buddhism religions could comfort the bereaves and provide the primordial need for mourning. They belief that funeral rites and procession is the best way to sending off their loved ones when life is coming to an ending point.

Obstacles that may prevent me from accepting new sustainable methods of managing burials is

149 responses

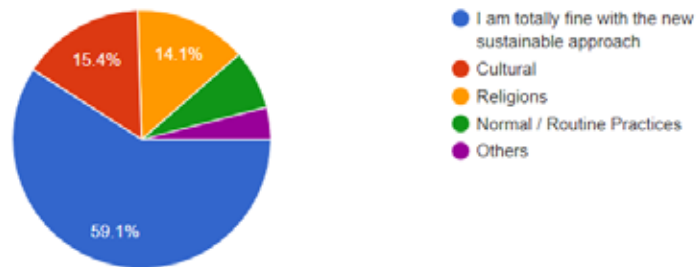


Figure 8 Obstacles that may affect the acceptance of new sustainable burial methods.
Source: The Author of this Article

Based on the figure above, most of the respondents (59.1 %), felt totally fine with the new sustainable burial approaches. Meanwhile, there are 15.4% of the respondents agrees that cultural aspect play a main role in deciding burial methods due to the cultural passed down from the previous generations. Besides, there are 14.1% of the respondents concern on the religious aspect in opting the burial methods. Although new sustainable death burial methods are being introduced, they felt that it is vital to follow religion rituals and practices during managing the death. Other than that, normal routine practices aspect is the least obstacles that affect the acceptance level of new sustainable burial methods among the respondents with 7.3% of the feedbacks from the respondents.

If I had the option to plan my own burial method as my parting gift to the world, I will

149 responses

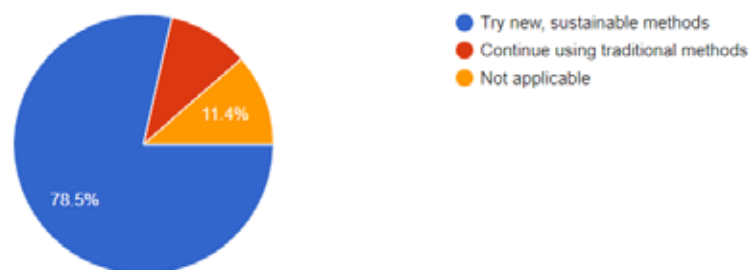


Figure 9 Respondents acceptance level on new sustainable burial methods if the respondents are given choices to arrange their last gesture on earth.
Source: The Author of this Article

According to figure above, it shows that the dominant percentage of the respondents, which is 78.5% choose to give a try on new sustainable burial methods if they were giving a chance in arranging their own parting gift to the world. They felt that the gesture of returning back to the earth is meaningful and acceptable at the end of the life. However, there are 11.4% of the respondents opt that it is not relevant while a small amount 10.1% of the respondents hope that they could remain their traditional funerary method if they are given an option to arrange their last gesture on earth.

I agree that cemetery should coexist with public spaces in urban to improve the image of cemeteries as a negative connotated entity.

149 responses

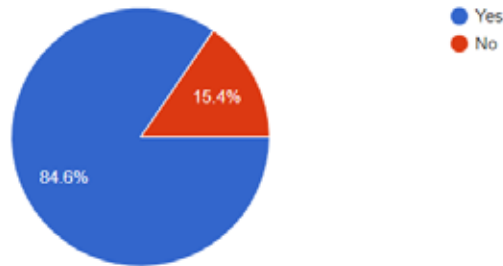


Figure 10 Respondents acceptance level on co-existed cemetery with public space.
Source: The Author of this Article

Figure above shows that 84.6% of the respondents accept that cemetery can be placed together with the public spaces while 15.4% of the respondents do not accept the co-existence of both cemetery and public spaces. This is most probably due to the reason that some respondents felt that death and cemetery are a taboo topic and negative entity to be discussed and with that social stigma, they are unwilling to have a closer connection with cemetery in their daily life.

I agree that Urban Cemetery can also be functioned as __ ? 1. Educational

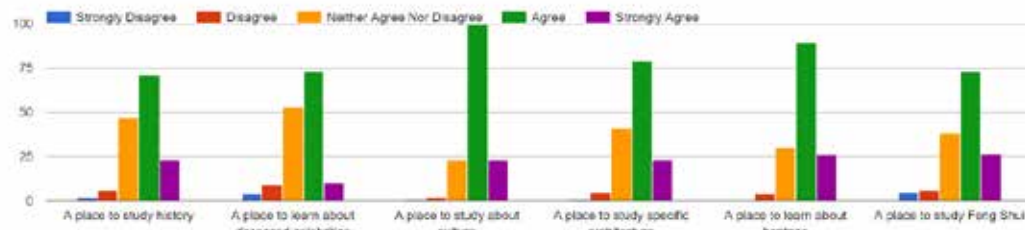


Figure 11 Respondents acceptance level on co-existed cemetery with public space.
Source: The Author of this Article

According to figure above, it shows that most of the respondents were in favor of utilizing cemeteries for educational purposes. Specifically, the majority of the respondents agreed and strongly agreed that cemeteries could be a place to study about cultures (82.5%).

I agree that Urban Cemetery can also be functioned as __ ? 2. Meditation

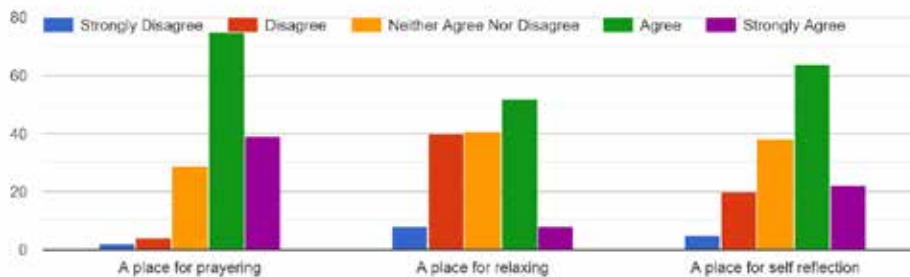


Figure 12 Respondents acceptance level on co-existed cemetery with public space.
Source: The Author of this Article

Figure above shows that other than educational purposed, majority of responders supported utilizing cemeteries for meditation purposed as well. Specifically, the majority of the respondents agreed and strongly agreed that cemeteries could be a place for praying (76.5%).

I agree that Urban Cemetery can also be functioned as __ ? : 3. Recreational

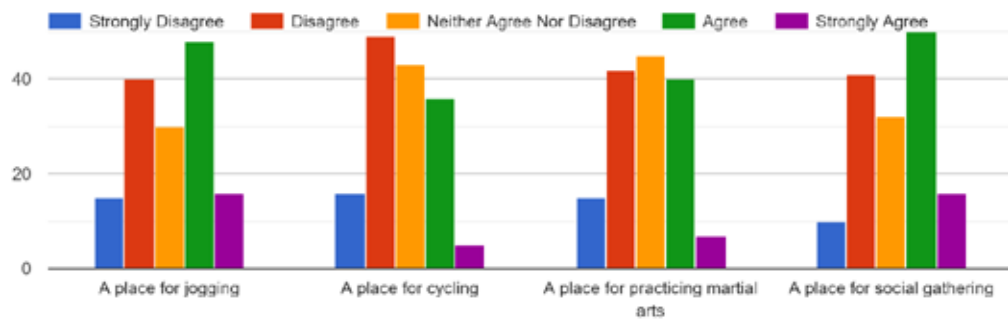


Figure 13 Respondents acceptance level on co-existed cemetery with public space.

Source: The Author of this Article

However, according to figure above, it shows that there is a controversial for an urban cemetery to be functioned as recreational purposed. The feedbacks from the respondents nearly balance out among each other, where the responses received are quite average compare to the previous options having urban cemetery to be functioned as educational and meditation purposes. Most respondents disagreed that cemeteries should be utilized for cycling, as it only received the least agreement according to the data collected with (53%) of disagreement while (22.7%) of agreement. Follow by the second unfavored recreational activities which is practicing martial arts by having (39.4%) of disagreed while (28.7%) of agreed. Most of the respondents have some concern on the suggestions of exploring cemeteries for recreational purposes. This is most probably due to the reason that cycling and practicing martial arts act as a contrary entity towards the cemetery which may break the peacefulness and give impacts to the mourners, which seems to be not respecting the dead and funeral rituals. However, the data shows that respondents are favor towards jogging activities and social gathering if were to explore cemeteries for recreational purposes. Jogging activities received (48.5%) of agreement compare to the (33.3%) of disagreement, while social gathering options received (45.5%) of agreement and (33.3%) of disagreement.

Functions of Urban Buddhist Cemetery that is more applicable to me in an urban setting are * can be more than one options *

149 responses

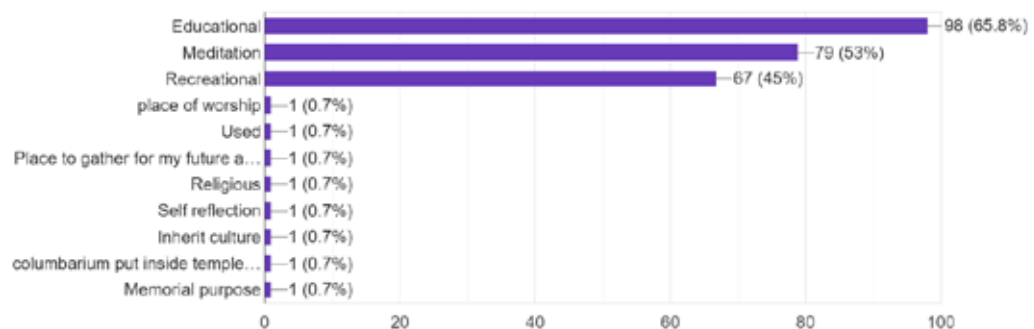


Figure 14 Respondents acceptance level on co-existed cemetery with public space.

Source: The Author of this Article

Figure above shows that 65.8% of the respondents accept that cemetery can be used as educational purposed, follow by the second highest rank, meditation which received 53% of the positive feedbacks from the respondents, and last but not least 45% from the recreational purposed. All in all, the data reflects that public shown a higher degree of acceptance for various cemeteries' uses other than as an eternal home which only serve for utilitarian purposes for the death. Respondents were able to accept the idea of using cemeteries for other purposes, specifically educational and meditation purposes follow by carefully screened recreational activities.

DICUSSION

Based on the findings obtained from the survey, most of the respondents expressed a firm belief in the pivotal roles played by cemeteries in society. They emphasized the indispensability of these sacred grounds, highlighting their status as essential facilities that hold great importance for individuals and communities alike. Remarkably, the respondents expressed the view that proximity to a cemetery does not make the area any less appealing, disagree that well run cemeteries have an adverse influence on the neighborhood. Moreover, the data also indicates that individuals from various religious backgrounds do not consider religion as a determining factor which affects their decision when choosing their residential location near to cemeteries. All in all, this indicates a widespread recognition of the positive contributions and harmonious coexistence that cemeteries can foster within their surroundings.

In addition, the survey respondents highlighted several other noteworthy issues. One significant concern relates to the low visitation rates experienced by cemeteries. This lack of regular visitors may indicate a disconnection between the community and these sacred grounds, potentially diminishing their significance and value in the eyes of the public. Next, the survey responses indicated a recognition of the negative environmental impacts associated with cemeteries. Issues such as the inadequate maintenance practices, and the potential for chemical contamination were raised, underlining the need for sustainable and environmentally friendly approaches to cemetery management. Moreover, the survey uncovered an intriguing societal aspect. The respondents expressed concerns about the lack of social relevance attributed to cemeteries. This suggests a need for initiatives and programs that foster engagement, education, and activities aimed at increasing community involvement with cemeteries. Enhancing their social significance can help dispel negative perceptions, cultivate a deeper understanding of their historical and cultural value, and promote a sense of belonging and connection among community members.

Furthermore, a deeper analysis of the responses gathered in Section C of the survey unveils an encouraging trend. A significant majority of the respondents, approximately 85%, demonstrated awareness of alternative and sustainable methods for managing death and burial. This finding reflects a growing recognition and understanding among individuals regarding the need for environmentally friendly and resource-conscious approaches to the end-of-life processes. The high level of awareness expressed by the respondents highlights a positive shift in societal attitudes towards embracing innovative and sustainable burial methods. It indicates an increased willingness to explore alternatives beyond traditional practices, which may have a more significant environmental impact.

By being aware of alternative methods, individuals are empowered to make informed choices that align with their values and contribute to a more sustainable future. The recognition of these sustainable options also signifies a broader societal shift towards prioritizing environmental stewardship and embracing practices that respect the Earth's limited resources. It showcases a growing consciousness among individuals about the long-term consequences of their actions, even after death, and a desire to leave a positive environmental legacy.

After introducing various sustainable death management methods to the respondents, one method that garnered significant acknowledgment is the Recompose method. This method involves a process known as natural organic reduction or human composting, wherein human bodies are gently transformed into nutrient-rich soil. The popularity of the Recompose Burial Method can be attributed to its alignment with the ideology of traditional ground burial practices, where the bodies are returned back to the earth, fostering a profound connection to nature. This approach aligns with the belief in the cyclical nature of life and death, emphasizing the importance of returning to the earth from which we originated. It promotes the regeneration of natural ecosystems.

Moreover, the findings from Section C also indicate a strong consensus among respondents regarding the need to redesign the typology of cemeteries in order to address the significant issues of traditional burial methods. Thus, the findings revealed a larger degree of acceptance among the respondents regarding the various uses of cemeteries beyond being solely eternal resting places for the deceased. The respondents displayed a greater openness to the idea of utilizing cemeteries for

alternative purposes, in addition to acknowledging the importance of coexisting and integrating cemeteries with public spaces in urban areas to overcome and improve the image of cemeteries as a negative connotated entity.

Building upon the previous statement, the results indicate a high degree of acceptance for urban cemeteries to serve as spaces with educational and meditation purposes. Respondents expressed a strong willingness to embrace the idea of transforming cemeteries into multifaceted environments that cater to the intellectual and spiritual needs of the community.

The concept of utilizing urban cemeteries for educational purposes resonated with the respondents. They recognized the potential of these spaces to become learning centers where visitors can engage in activities that promote understanding and appreciation of history, culture, heritage, as well as architecture and Feng Shui studies. By incorporating interpretive signage, interactive exhibits, and guided tours, cemeteries can provide a unique educational experience that brings local history to life and deepens the connection between past and present. Additionally, respondents also emphasized the importance of urban cemeteries as serene settings for meditation and reflection. They acknowledged the potential of these spaces to offer a tranquil retreat amidst the hustle and bustle of urban life. By providing worshipping and praying spaces, well-designed gardens, reflect and relax corners, as well as contemplative spaces, cemeteries can become sanctuaries where individuals can find solace, engage in introspection, and seek spiritual nourishment. The peaceful ambiance and natural surroundings of cemeteries create an ideal environment for mindfulness, personal growth, and emotional healing.

Meanwhile, it appears that there is a degree of controversy surrounding the idea of utilizing urban cemeteries for recreational purposes. The feedback from respondents is relatively balanced and average. With the results shown, the respondents displayed concerns and reservations regarding the integration of recreational activities that might disrupt the peacefulness of the cemetery environment and potentially impact mourners. This perspective reflects a desire to uphold respect for the deceased and maintain the sanctity of funeral rituals, as most respondents disagreed with the suggestion of using cemeteries for cycling activities and martial arts practicing, but more open to certain recreational activities, such as jogging and social gathering. For such, jogging and social gathering, such as picnics or small gatherings, which is being a low-impact physical activity, is seen as less intrusive and potentially compatible with the peaceful atmosphere of cemeteries, which could provide opportunities for community engagement and connection while still respecting the space and its purpose.

Overall, the responses indicated a strong inclination among respondents to prioritize sustainability in death management while simultaneously recognizing the significance of funeral traditions and honoring the values associated with them. The willingness to embrace sustainable death management methods was driven by a belief in the natural cycle of life, the desire to benefit the environment, and the alignment with religious teachings and primordial needs emphasizing environmental stewardship.

CONCLUSION

To sum up, the survey results indicate that the majority of respondents believe there is a pressing need to transition from current cemetery typologies to more sustainable approaches in Malaysia. The main driving force behind this demand is the issue of limited space for cemeteries and environmental issues caused by ground burial and cremation. The survey findings reveal the increased awareness among respondents regarding alternative and sustainable burial methods. This awareness signifies a growing commitment to environmental responsibility and a desire to make conscious choices even in the realm of death management. Most respondents expressed their support for sustainable burial methods, provided that it respects and preserves funeral customs, align with their values and addresses the essential needs of mourning according to their cultural and religious beliefs.

Despite that, the majority of respondents accept the coexistence of cemeteries with public spaces, emphasizing the importance of respecting the privacy of bereaved individuals during funeral rituals. The acceptance of urban cemeteries being utilized for educational and meditation purposes

reflects a forward-thinking mindset among respondents. By embracing these functions, cemeteries can evolve into engaging spaces that offer opportunities for intellectual stimulation, historical exploration, self-reflection, and contemplation all within a tranquil and meaningful setting to cater the needs of the community. This multi-dimensional approach of the coexistence of cemeteries with public spaces in urban areas, not only enhances the value and relevance of cemeteries but also fosters a positive perception of these spaces as transformative environments for personal growth and contemplation. By integrating them into the fabric of the community, we can create inclusive, aesthetically pleasing, and culturally enriching spaces that promote a positive and holistic approach to death and remembrance. This integration not only improves the image of cemeteries but also contributes to the overall well-being and cultural vitality of urban environments. Aligning with the respondents' desire for cemeteries to transcend their conventional roles, becoming vibrant and inclusive spaces that cater to diverse community needs.

Overall, the responses indicated a strong inclination among respondents to prioritize and highlight the need for change in cemetery practices toward sustainability, the importance of preserving funeral traditions, and the concerns surrounding public acceptance and integration in order to contribute to a more sustainable and resilient future.

However, this study has potential limitations. This study is limited on to redefine future Buddhist cemetery in urban setting, where the sample size for the study may be limiting the generalizability of the results to the wider Buddhist community. In addition, there is a limited scope of study, the study focuses solely on the design needs of Buddhist community in urban setting and does not consider other important factors such as grief support. The measuring of emotions is intangible and are sensitive subjective matters.

Future research can focus on increasing the sample size to improve the generalizability of the results and incorporating additional methods of data collection such as interviews and focus groups to enhance the validity of the findings. Besides, future research can explore more on taking advantage of the incessant technological advance and its implementation in assisting emotional support, such as having online digital remembrance method.

Furthermore, for the future research, organizations such as BREEAM (Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environmental Design), and MGBC (Malaysia Green Building Council) are recommended to accustomed criteria and program for rating and compare the standards and green practices of funeral industries and cemeteries for raising the sustainability practices of cemetery typologies in Malaysia.

ACKNOWLEDGEMENT

The author would like to express sincere and special gratitude to advisor Wan Srihani Wan Mohamed and the surveys' participants for their invaluable participation and insightful feedback in this study.

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EXPLORING ON TRANSITIONAL LIVING SPACES TO IMPROVE QUALITY OF LIFE OF MARINE FISHERMEN IN KUANTAN

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ABSTRACT

Transitional living spaces are considered to be a short-term accommodation arrangement that are designed to help individuals or families who are experiencing a period of transition or instability and are expected to lead them towards a more stable setting of living condition. However, the current architectural approach towards transitional living spaces or accommodations for fishermen in Malaysia do not address properly to the needs of fishermen and are usually designed universally. Therefore, due improper spatial quality of such living spaces, instead of improving the living quality of the fishermen, it has become a bigger challenge to overcome. Hence, the aim of this research is to explore on the living condition of fishing communities in Malaysia and produce a design framework on designing transitional living spaces for them. This research is based on ethnography of qualitative methodology and will use literature review, interview and observation as methods of data collection. Furthermore, the expected outcome is to produce a design framework on designing suitable transitional living spaces for fishermen in Kuantan. By producing such a framework will help to increase awareness on importance of transitional living spaces for fishermen which would contribute to improve quality of fishermen's livelihood. This research will only focus on producing framework for transit living spaces for middle aged fishermen.

Keywords: *transitional living spaces; quality of life; design framework; awareness; fishermen*

INTRODUCTION

Malaysian government is playing a vital role in helping communities of Malaysia to improve the standard of their lives. Especially, they have introduced schemes for fishing communities to subsidize petrol needed for fishing boats, housing of fishing communities and even monetary allowances to fishermen (Ali et al., 2017). Yet, fishing communities of Malaysia are considered as living a low social life compared to the typical Malaysian communities which is leading to poverty and poor living conditions (Rhoumah, 2016). With the rapid urbanization, the financial gap between these communities and the rest are getting more significant. However, regardless of incentives given to the fishing communities in building new homes or renovating the existing ones, there is no effort put in understanding the type of living spaces fishermen and their communities need especially while transiting at the jetty in between fishing rounds.

According to (Ghani et al., 2017) correlation analysis showed indicators of income, savings, housing, family surroundings and fishing equipment contributed to the enhancement of quality of life among fishermen. In addition, the layout of a fishing village is influenced by the culture of community living (Ofori et al., 2020). Furthermore, the limited knowledge of fishermen also makes them not motivated to improve the quality of their settlement environment (Widyo, 2019). Hence, to improve the living standard of fishing communities has become a challenge and an issue which might need to be address quickly.

The daily activities of fishermen vary from day to day. However, in general fishermen spend most of their time on the seas and the housing arrangements made on land is considered more as a transiting point in between fishing rounds. According to the current situation on a typical fishing village in Malaysia, there are few demography types of fishermen and their families when

it comes to housing. Housing for fishermen is being built at the coastal areas and in a close proximity to their jetties through government incentives. Lembaga Kemajuan Ikan Malaysia (LKIM) introduced Fisherman Housing Special Project along with Fisherman's Subsistence Allowance. Housing project is an aid given to low-income fishermen to repair houses and build new houses. This project will also develop the resettlement of fishermen to provide well-being to the fishermen's families. Fisherman's Subsistence Allowance is a monthly assistance to individual owners of fishing vessels and citizen workers working on licensed vessels. The assistance rate for the year 2021 was as much as RM 300.00 (Lembaga Kemajuan Ikan Malaysia). However, usually these houses are provided for fishermen with families. As a result, single fishermen and fishermen based on a state other than their hometown, do not have proper arrangements made for this transitional period. The spaces utilized by them are mostly temporary shelters made on coastal areas, commonly right next to their jetties. Some of the basic necessities are done in poor hygiene and improperly.

The main challenge faced to the fishermen is that most of them cannot afford to rent a place nearby due to their financial status and also is not considered feasible on renting monthly from a typical apartment or so as they spend more than half of the month out on the sea. Secondly, as they do not have means of travelling such as cars or motorcycles and usually the coastal areas are not covered by public transportation, the only option for them is to be provided proper basic needs in a close walking distance. Also, these housing to be designed and managed in consideration of their schedule of fishing.

A partial solution for this issue is to understand their activities while on land and government to include these types of housings into their subsidy list. However, since this type of housing will not be a complete solution for a permanent housing, it shall be considered as a transitional living space. Transitional living spaces are considered to be a short-term accommodation arrangement that are designed to help individuals who are experiencing a period of transition or instability. Hence, the expectation would be that they will be able to find a more stable income eventually, and as a result they could manage the living expenses by themselves just like the rest of the communities.

Even though the housing of fishermen especially while transiting is considered a contributing factor for quality of life among fishermen (Ghani et al., 2017), no much research has been done to identify the transitional living space needed for fishermen and the design of such spaces are not being addressed architecturally. Since there are different preparations/activities done by fishermen on land, in between fishing rounds, these should be considered while designing a transitional living space for the it to function more efficiently. Therefore, this research will contribute to formulate a design framework on designing suitable transitional living spaces for fishermen in Malaysia. By producing such a framework will help to increase awareness on importance of transitional living spaces for fishermen which would contribute to improve quality of fishermen's livelihood.

LITERATURE REVIEW

Literature review aims to explore and understand the typology of transit living spaces fishermen need in term of spatial organization, characteristics, fishermen's demography and how transitional living spaces influence on their livelihoods. This literature review is conducted using Google scholar, Scopus, Science direct and Research gate. Since there are very few or no researches done on transitional living spaces for fishermen, this literature review will try to summarize similar research findings through; 1) Understanding about transit and unsettledness, 2) Discusses about transitional spaces, 3) Transitional living spaces, 4) Difference between transitional living spaces and transit living spaces, 5) Understanding the connection between transitional living spaces and youth in fishing industry.

Literature reviews are based on 2 main deductive which were extracted from the research objectives. Deductive are:

- D1- Influence of transitional spaces
- D2- Transitional living space design

Transitional living spaces

Transitional living spaces, also known as transitional housing or halfway houses, are temporary accommodations designed to support individuals or families who are transitioning from one living situation to another due to instability. These spaces are typically intended for people who are experiencing homelessness, leaving correctional facilities, overcoming substance abuse or addiction, or exiting foster care and provides a safe, stable, and supportive environment (Wikipedia, 2020).

The purpose of transitional living spaces is to provide a stable and supportive environment where individuals can gain necessary skills, support, and resources to successfully reintegrate into society and achieve long-term stability. These spaces often offer a range of services, including counseling, case management, life skills training, job placement assistance, and access to education or vocational programs (Homeless hub).

Fishermen and transitional living space

Fishermen in land could be considered both as if they are in a transitional state or that they need a transitional living space for a short period from time to time. Currently housing of fishermen are subsidized and are given out for fishing families (LKIM). Aimi in the paper of “the effectiveness of the government program to young fishermen in malaysia” has stated that housing allowance for fishermen has three categories which includes building a new house, home renovation and resettlements. There are specific budgets allocated to each of these categories. All these housing allowances are very much standard or universal. Most of the housings are under the ‘townhouse’ category and are given for ‘rent to own’ schemes (Menteri Besar Datuk Seri Ahmad Razif Abdul Rahman). Speaking about a housing project in Terengganu, Razif further explained that these housings will benefit 2000 fishermen in Terengganu including their families. According to LKIM, government of Malaysia aims to create fishermen settlements along with supporting infrastructure such as futsal court, playground, kindergarten, shop and others This is standard scenario in housing of Malaysian fishermen. Considering that there are stay-alone fishermen who are either away from family or are single, these schemes might not be suitable.

Youth in fishing industry

(Ahmad. et al., 2020) stated that despite of contribution of fishing industry in economy of Malaysia, the number of youths in this industry is significantly low. He further stated that even though the number of incentives schemes introduced and implemented for the past 10 years, it is questionable of the effectiveness of these schemes. This research mentioned that a majority of 59.4% are fishermen aged between 41-46 years. The age group considered as youth 15-40 years, contribute only 30% of the whole fishing industry in Malaysia. Hence this supports the argument of current housing schemes are not suitable for youth as a huge percentage of them are single and might prefer living alone. Furthermore, due to regulatory measures, modernization efforts, rationalization attempts, and professionalization initiatives, along with the sector’s reputation in the local economy, young individuals have shifted their interests elsewhere. The declining trend in youth involvement can be attributed to a combination of challenges such as limited accessibility due to expensive fishing boats and quotas, the profession’s diminished status, and the extremely physical and long working hours. Consequently, there has been a significant decline in youth recruitment over the past two to three decades (Even et al., 2014). These findings show that there are various negative factors towards fishing industry and as a result, youths are saying ‘no’ to be part of it. Providing with a proper typology of living space for fishermen will not only ease their basic needs, but also could positively contribute in youth’s interest towards becoming a fisherman.

Influence of transitional spaces

Transitional spaces have a significant, however a subconscious influence towards users. It could be a placement of a window, how light penetrates and materials or colors can determine overall mood of a transitional space. Often hallways, alleyways, or even empty spaces are considered as transitional space of a building. As mentioned by Brown and Lippincott, (2003), recently a lot of learning process at schools are done out of the classroom. For this reason, (Amit kumar, 2015; Dole et al., 2016; Wilson & Cotgrave, 2016) mentioned that, it is important to create informal

learning spaces which could be also a transitional space. Additionally, (Monsur, 2013) examined particular elements of architecture that are responsible for motivating play/learning behavior among children in a child care/preschool setting.

Well-designed transitional spaces can imply a positive influence over work place, staff and customers too. Such spaces could assure commitment and satisfaction of staffs by providing an environment of informal socializing beneficial for team building and staff bonding. However, outcome of breaking barrier between employees and creating a social interaction has been a conflicting argument. While some studies favor the argument, others show that a social oriented workspace reduces privacy, feeling of ownership and control hence reducing the performance (Bankins et al., 2020). Additionally, creating a connection between staff to staff and staff to patients are considered to be a critical factor to ensure smooth and fast healing of patients in clinical context. For example, hospital corridors, also known as a transitional space within hospitals play an important role in strengthening the above-mentioned connection. In a recent analysis of architectural characteristics that impact communication and teamwork in various hospital and healthcare environments, it was observed that layout design, visibility, and accessibility emerged as the prevailing factors affecting staff communication (Morgan et al., 2021).

In the research done by (Widyo, 2019) to identify and analyze the cultural characteristics of the community in the fishing village, as a basis for efforts to arrange open space settlements, He mentioned that having open spaces in fishermen settlements help to improve their quality of environment hence improving standard of life overall. Even though, this research paper did not demonstrate transitional living spaces for fishermen specifically, it indicates that having open spaces which could extend landscaping and other natural elements, do not only enhance the environment factors but also improves quality of life of fishing villages. Traditional villages of villages back in the days were known for the close relationship they had with the neighbors and for maintaining a strong cultural belief. The villagers' homogenous culture and their reliance on subsistence economic activities such as traditional paddy farming and fishing foster strong interdependent relationships among them (Ahmad et al., 2010). Further he explains that, as a result the layout of such villages is highly influenced by the culture and religion. They preferred unfenced house boundaries, openly planned surrounding, and often private and public open areas were interconnected. Reason behind this was that the villagers preferred community intimacy. Even if the open spaces in these settlements were not considered as transitional spaces back then, these spaces now could be classified as transitional spaces since it carries similar utilization such as getting socialized, building connections and has characteristics which falls under that category.

Transitional space is not directly occupied by any major activities in the building; however, it has a large implication to occupant's experience and building energy consumption (Prihatmanti & Taib, 2017). Transitional spaces could be utilized for various activities which do not require and indoor space necessarily such as small vending businesses, art works, street parks etc. Lately, there has been a surge of interest and significant research focused on outdoor thermal comfort. Within the realm of architectural place-making, it is crucial to acknowledge and appreciate spaces both inside and outside of buildings, not only for their visual appeal but also for their energy-saving potential (Chun et al., 2004). Furthermore, as the interest in symbiotic building continues to grow, there is a corresponding rise in the demand for spaces that allow occupants to connect with and experience nature.

Hostels, homeless shelters, other temporary shelters and accommodations are considered as transitional living spaces. Temporary shelters can have various psychological influences on their users. Sense of security ensured in such shelters or living spaces can help to reduce provoking anxiety, to make users calm and fearless. Ultimately could help in relieving stress by the other facilities provided such as self-support, social engagement etc. On the contrast, a facility designed without taking elements of psychological impact, could make the matter worse by putting users in a psychologically unsettling state. Some researches show that students in hostels could be exposed to extreme stress due to different design factors and they are adapting new strategies to cope with it (McMordie, 2021). He explores on theories of how student hostels have a psychological effect of stress on decision making, building of social support and coping behaviors. Later he demonstrates

that abandonment of hostels or similar accommodations is due to unmanageable stress and threats. Additionally, in research done only based on hostels within universities mentions that the stress and other factors within hostels negatively impacts student's academic performance according to (Hasan & Fatima, 2018). Designed without consideration of mental health, transitional living spaces or accommodations could be a more negative influence rather than improving user experience. Other than transitional living spaces, transitional spaces within buildings could contribute either to benefit or deteriorate mental health of the users. With the growing complexity of modern city living, people are experiencing heightened levels of stress, making the need for stress relief measures in constructed environments more crucial than ever. Previous studies have shown that both linear and nonlinear designs in the surroundings can influence human stress recovery. However, the majority of research has concentrated on indoor and outdoor spaces, leaving transitional spaces relatively unexplored (Cardinali et al., 2023). He further explores on the matter by hypothesizing that curved and linear environments do have different effect towards users of the transitional space in terms of stress relief. A well-designed transitional space, which is often frequented in modern urban settings, has the potential to transform into a revitalizing urban shelter, providing relief from the negative effects of growing overcrowding.

Transitional living space design

A living space must have the means of basic necessities such as resting areas, toilets, cooking facilities, storage, living areas etc. However, when it comes to transitional living spaces, the function of the space might defer depending on target user and their needs. As a result, the components of such spaces will differ accordingly. For instance, youth drug rehabilitation centers will consist of therapy rooms, communal spaces and clinics (Goyena & Fallis, 2019). A drug rehabilitation center is an establishment or structure dedicated to the practice of drug rehabilitation. It can be described as a place where individuals receive both therapeutic and social care. While a drug rehab center may include healthcare and psychiatric services, they are typically integrated as departments within a psychiatric hospital, with their administrative and support functions centrally managed by the host (Goyena & Fallis, 2019).

Hostels are usually larger than normal residential dwellings whereas homeless shelters normally are in residential dwellings, shared by few people. These two typologies of transitional living setting however do have similarities in terms of social and legal restrictions (Busch-Geertsema & Sahlin, 2007). Hostels are set apart from other forms of temporary lodging primarily due to their restricted private areas. In essence, hostels are primarily characterized by their communal atmosphere, where the focus is on shared spaces such as dormitories. Unlike hotels, the primary unit being offered for sale in hostels is not the room itself, but rather the individual beds within the dormitories (Verissimo & Costa, 2018). Particularly in overnight shelters, multiple individuals often share sleeping quarters in the same room. Facilities for cooking and dining are typically shared among residents, and common areas may also incorporate communal sanitary facilities such as bathrooms and toilets (Busch-Geertsema & Sahlin, 2007). On the other hand, according to (McLane, 2022) homeless shelters offer more variety of services depending on the target user. These include medical triage care, counselling, and computer and internet access, vocational training and assistance with finding employment as well. The typology of living space fishermen need can be a combination of both of these two types of accommodations. it can consist of common spaces along with special spaces such as shaded working areas to mend net, do small repairs of tools and so on according to their unique lifestyle and work.

(Marpaung & Winny Silaban, 2018) identified in their research the structure of settlement and the relationship between the space structures with the spatial pattern in Belawan Medan Fishermen Village. They mentioned that similar spatial pattern is found between one unplanned settlement and another unplanned settlement. Furthermore, a more interactive transitional space can be achieved by creating more linear connecting space rather than choosing clustered spaces. In other words, all spaces connecting with a linear corridor perhaps, will help in creating are straight visual connectivity along with simple physical connectivity. In clustered arrangements, layer of spaces create an indirect barrier between spaces and human connectivity (Morgan et al., 2021).

Public spaces in general are known for its gathering, interaction and socializing characteristics. For that reason, such spaces are being incorporated into villages in order to enhance the space quality. Galampa, a public space, has been a longstanding and essential component of the historical and social fabric of the Holimombo Jaya Village community. Situated east of the mosque, Galampa serves as a symbolic representation of a world that is constantly connected. It functions as a communal gathering place, providing a platform for discussions on a wide range of topics pertaining to the social, economic, and cultural aspects of the community (Ahmadin & Amiruddin, 2020).

(Chun et al., 2004) explains that thermal comfort plays an important role for the quality of space and that it can vary depending on the amount and duration of users. They also theorized that the since the typical behavior is more casual in transitional spaces compared to offices, schools etc, the activity done in transitional spaces have a major influence in thermal comfort.

To prevent heat gain, especially in an urban setting where heat island effect is prone and have limitation space, a lot of researches are looking into incorporating vertical greeneries in transitional spaces. According to (Prihatmanti & Taib, 2017) for the past decade, there has been a growing trend in incorporating vegetation into buildings. Numerous newly constructed low and high-rise buildings have begun recognizing the significance of integrating green spaces within their structures. This can take the form of rooftop gardens or both vertical and horizontal greenery. They further explain that the existence of greenery on buildings, particularly in Singapore, Malaysia, and Thailand, where the climate is hot and humid, has prompted numerous scholars to delve into the advantages it offers.

To explain further (Li et al., 2022) in 'Effects of the Visual Character of Transitional Spaces on Human Stress Recovery in a Virtual Reality Environment' developed a theory that with the increasing stress rate due to urbanization, it is important to address this issue in buildings. And then they hypothesized that curved and linear environments affect human stress recovery differently in transitional spaces. To understand further, it has been concluded that residing on campus plays a crucial role in shaping various aspects of university experience, encompassing learning, cognition, attitudes, psychosocial development, and educational achievements (McCartney & Rosenvasser, 2022). Unfortunately, architectural design could play a role in why students not keen to stay in hostels or in campus. One of the major factors might be having to share personal spaces such as toilets especially on traditional hostels. In effort to improve the quality of students, more modern layouts of student accommodations are being researched and implemented worldwide. Furthermore, some researches have shown that students prefer staying in upper floors due to privacy it provided to them (Hasan & Fatima, 2018).

One of the most important characteristics as I consider is mentioned by (Maliki et al., 2015) in his research on 'Recalling the Transitional Space: City home and Kampung home'. He mentioned about the importance of privacy on transitional spaces in housing. Issues regarding privacy frequently appeared in the participants' narratives. In city apartments, strangers could walk right up to one's door and windows, reducing the privacy of the dwellers. On the other hand, the need for greater security and privacy has led to the creation of modern house designs which give adequate privacy but at the same time giving the sense of 'caging' the dwellers indoors and blocking any informal interaction with neighbors. Therefore, according to (Maliki et al., 2015), there should be a balance between privacy and openness as it also plays a role in socializing between dwellers.

Under the topic of "North Taiwan: Fishing Village Housing Redevelopment", (Tiene, 1980) talked about the Taiwanese fishing village settlements back in the days. She mentioned that the gathering of individuals holds great significance in a fishing village of Taiwan, as humans are inherently social beings and are constantly engaged in a struggle against nature. Typically, in the majority of fishing villages, people convene at the spacious section of the main street, with a small grocery store often serving as the central hub for these gatherings. With the same concept, houses of fishing villages consist of three main quarters where an ancestral hall links all the quarters of the house. This hall is also known as the social gathering point of the house.

Conceptual framework

As transitional spaces can influence the user to a high extent, it is also directly linked to how the space is designed. Considering the current housing situation of fishermen in Malaysia, it is understood that current designs do not have considered in accommodating the demography of single fishermen or fishermen away from their families, it is important to have deep research and understanding on fishermen livelihood in order to produce a successful design framework.

The design consideration of transitional living spaces for fishermen could be privacy, thermal comfort, employment type, typology of space, open spaces, height and location. Other factors which might need to be considered are daily activities, leisure activities, interests, type of interaction within them, preparation works done for the next fishing round, duration of stay etc.

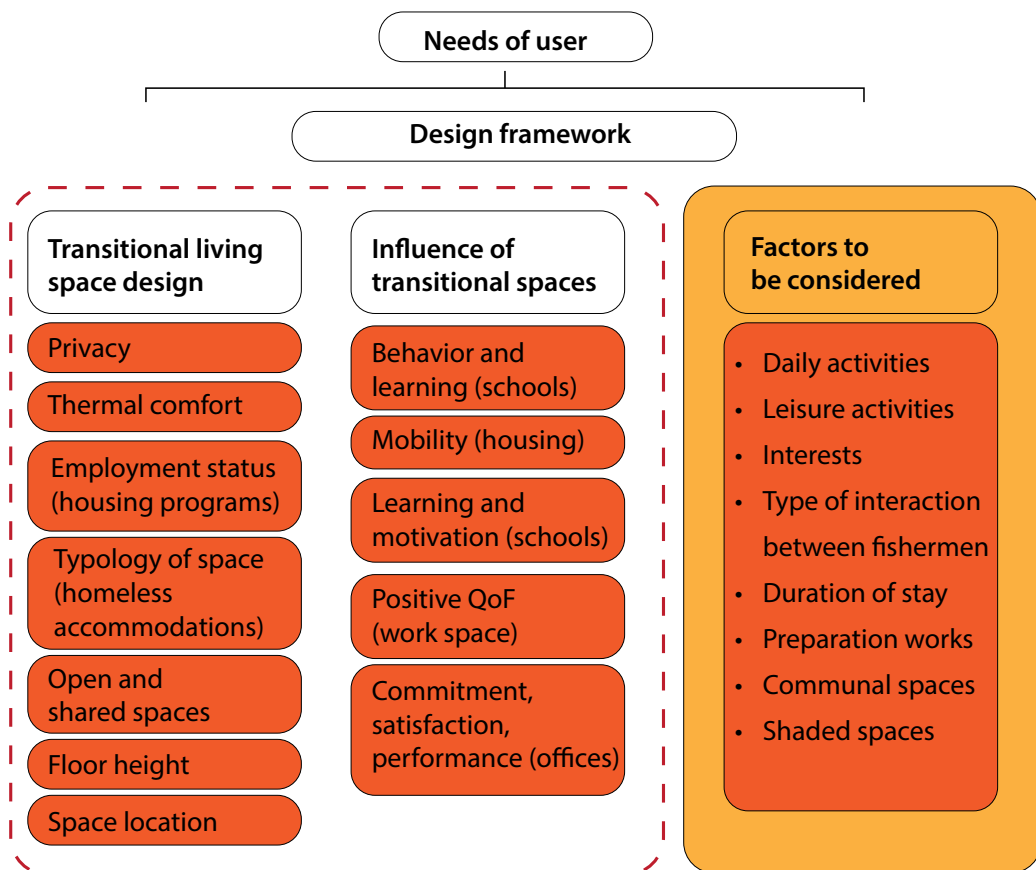


Figure.1 Conceptual framework.

Source: Author

METHOD

This research is just focused on a specified study area and fishermen as the study group. To accurately understand the context of fishermen, it requires direct conversion, observation and being in their context. Qualitative research methodology is applied in this research for its significant characteristics towards that methodology and finding it the most suitable for this research. Hence, it is interpretivist research which consists of biased multiple realities of writer's experience and judgements.

This research investigation will embrace an ethnographic approach, which involves studying the shared experiences of a community (H, 2017). This method is particularly well-suited for understanding the collective experiences of fishermen as a community. According to (Veer & Maanen, 1990) although there isn't a set guideline for the duration of an ethnographic study, it is commonly advised that the study should extend for a satisfactory duration to facilitate comprehensive comprehension and thorough data gathering. Conducted over four separate occasions spanning from March 2023 to July 2023, this research involved immersing oneself in the daily activities of fishermen in Kuantan for extended periods. This approach enabled the researcher to gain a deep comprehension of the fishermen's attitudes and actions, as well as their various encounters throughout the day across different times of the year. Meanwhile, interviews were conducted throughout this duration.

Data collection methods

Data collection methods are elaborated in table.1.

Table.1 Data collection methods.

	Sub RQ 1	Sub RQ2
	How are current transit living spaces utilized or functioned?	What are the required components to design transit living spaces for fishermen in Kuantan?
Objective	To identify current situation of transit living spaces for fishermen in Kuantan	To formulate a design framework of transitional living spaces for fishermen in Kuantan
Deductive	Transit living space for fishermen	Influence of transitional spaces
	Utilization of transit living space	Transitional living space design
	Function of transit living space	
Data collection method	Interview and observation	Observation and desk review

Source: Author

Data Analysis Techniques

As data collected in this research focused on a small group of participants with semi structured interviews, focus groups and observation, the most appropriate data analyzing method was through thematic analysis. As explained by (Addington et al., 2007), thematic analysis approach is applied when the research has a small to medium sample size where data is collected through semi structured interviews, focus groups, images and written texts. Code and themes of data is analyzed by using Atlas.ti software as a guide.

RESULT AND DISCUSSION

As this study is to formulate a design framework for transit living spaces of fishermen in Kuantan, data collected is to understand current condition of fishermen in Kuantan coastal area. Findings of this research were used to formulate a Thematic Analysis Matrix (TAM) which identified major themes related to the issue and eventually became the guideline to formulate the mentioned framework.

Interview and observation results

All the respondents of the interview are based in Kuantan. 5 fishermen participants belonged to two different fishing communities in Kuantan riverfront area. All of them worked in deep sea fishing boats.

The majority of interview participants emphasized that they reside either in the coastal region or in government-provided housing near the coast. Originally, the reason for establishing traditional fishermen settlements in coastal areas was the convenience of having their homes close to their work, considering the transportation challenges they faced. This practice has continued until today, with current fishermen in Kuantan preferring to live near the coast for the same reasons. Their preference is also influenced by the lack of private transportation options and the unfriendliness of public transportation in Kuantan. Furthermore, based on the responses from most participants, the choice of settlement location is influenced by their fishing routine. Since their primary facility hub is the LKIM complex on the coast of the Kuantan River, it is convenient for them to reside in close proximity to the LKIM complex.

Respondents provided further insights into how they fulfill their basic needs, highlighting the challenges posed by the current arrangements. Many individuals mentioned that meeting these necessities often involves traveling deeper into the city and relying on public transportation or walking, as personal vehicles are scarce among them. Consequently, this leads to the unnecessary consumption of time and energy. Additionally, the fulfillment of basic needs is influenced by personal preferences and the availability of facilities. People's choices regarding meeting these needs, utilizing their free time, and deciding where to spend their days off are all dependent on their individual will. This aspect significantly influences the spatial spaces and the type of living environment that fishermen prefer. The researcher discovered that in Kuantan, where the fishing community comprises exclusively of men and their secluded lifestyle allows for a relatively flexible perception of privacy, they are able to experience a sense of privacy even without proper shelters or accommodations. However, this depiction raises concerns about social stigma, and the situation is expected to change as developments encroach upon or adjoin fishermen settlements over time.

A significant proportion of survey participants emphasized the impact of their employment type on their consideration of accommodation costs when selecting a place to live. In the fishing industry, employment types are classified based on the type of boat fishermen operate, with boats labeled as C1, C2, C3, and C4, progressively increasing in size. The larger the fishing boat they work on, the further out to sea they venture, resulting in longer fishing trips and comparatively higher earnings. Consequently, fishermen working on larger boats often have the means to explore alternative accommodation options. Nevertheless, the fishermen who generate higher incomes are those who dedicate more time to their work, rendering it impractical to allocate a substantial sum towards coastal accommodation. Additionally, the availability of government incentives, such as housing schemes, that aim to subsidize fishermen's expenses further influences their accommodation choices. Yet, many fishermen, especially those who live alone, prefer residing in coastal shelters due to their minimal cost.

Desk review and observation results

The process of conducting a desk review aided in identifying both similarities and differences among various fishermen accommodations implemented across different countries. A comparative analysis is in table 4.2 of the desk review.

Table.2 Comparative analysis of desk review.

<i>Criteria</i>	<i>Review 1</i>	<i>Review 2</i>	<i>Review 3</i>
Typology	Cabin	Hut	
Location	Near the sea	Between mountains and sea	Coast
Usage	Temporary transit	Temporary or permanent	Permanent
Material	Wood	Wood	Concrete
Spatial arrangement	Two rooms and a storage and a living room with a bed	Two levels, lower for boat shed, upper level for living	Mixed and shared living arrangements distributed to two levels
Open spaces	Living room	Allocated outside	Flexible spaces
Income	Supporting income generation space such as air bnb	Potential eco-tourism	Convertible spaces to accommodate businesses
Adaptability	Considerate of extreme weather	Easily accommodate needs	Incorporated existing activities
Affordability	High	High	Medium
Potential typology	Studio units	Studio units	Shared housing/ hostel
Overview	Fishermen utilized these cabins to seek shelter from weather and convenient stay while transiting between fishing rounds. Simple and modest cabins created a vivid environment.	These huts were used by fishermen for short duration of stays. Eventually these became Japanese traditional houses for its unique and highly functional design.	Shared housing units with emphasis on common spaces and proper amenities will enhance the efficiency of fishermen and increase their productivity. Flexible and convertible spaces are an important factor to allow different activities as needed.

Source: Author

Comparison with LR

Table 2 shows comparison with conceptual framework (figure 1) and data analysis. It shows similarities between key terms highlighted in conceptual framework, coding identified in analysis of interview and criteria identified in analysis of desk review

Table.3 Comparative analysis between LR and data analysis.

Key terms of conceptual framework	Coding identified in analysis of interview	Criteria identified in analysis of literature review
Privacy	Privacy	-
Thermal comfort	-	Spatial arrangement
Employment status	Employment type Affordability Income	Income Affordability
Typology of space	Facilities Necessities	Typology
Open and shared spaces	Routine	Usage Open spaces
Floor height	-	Usage
Space location	Location	Location
Behavior and learning	Necessities	Adaptability
Mobility	Location	Location Potential typology
Learning and motivation	Routine Relationship status	Adaptability
Positive QoF	Quality of life	Adaptability
Commitment and satisfaction	Personal preferences Cost	-
		Material

Source: Author

The research on data analysis revealed that fishermen have difficulty understanding their requirements regarding transit living spaces. They are accustomed to and content with the current transit conditions. Nevertheless, enhancing the well-being of Malaysian fishermen has become crucial, especially as they are expected to participate in this era of development. Negative perceptions and potential future problems could undermine the fishing industry, which is already facing decline. Hence, it is crucial to cultivate awareness among fishermen so that they can comprehend and embrace a novel lifestyle, considering that adjusting to change can pose difficulties.

Key aspects that should be addressed include the provision of necessary amenities such as efficient waste management systems, sewerage systems, and security measures like adequate lighting and well-designed walkways. Additionally, it is important to prioritize cleanliness, hygiene, and the safe handling of hazardous materials. Ensuring public safety and facilitating easy and comfortable access, especially for people with disabilities (PWD), should be emphasized.

Enhancing fishermen settlements relies heavily on effective site management, with the primary focus being on optimizing spatial organization and quality. While individual fishermen may engage in different activities during transit and have varying preferences for how they spend their time on land, it is important to identify shared factors. By comprehending these common elements, it becomes feasible to create spaces that cater to all types of activities, even in a prototype design, ensuring suitability for all fishermen.

Fishermen are known for their uncomplicated and adaptable way of life. They prefer simple and minimal way of living. This is not necessarily a negative aspect, as it serves its purpose in a straightforward manner. Their living spaces also appear to be suitable for do-it-yourself modifications. Similarly, their resting places are often found outdoors, such as hammocks tied between two trees. When it comes to their working areas, they make use of surrounding such as utilizing the roof structure to hang damaged sections of fishing nets. In essence, they make the most out of their immediate surroundings, which is a crucial consideration when determining space requirements and furniture choices.

When creating designs to accommodate these spaces, it is crucial to prioritize innovative approaches to compact living and minimize space inefficiency. Additionally, incorporating green building features is essential for achieving cost-effective building operation. It is important to carefully consider building orientation, placement of windows and doors, as well as the selection of materials. By focusing on low maintenance and functional costs, the affordability and durability of the building can be enhanced.

Despite the fact that fishermen generally have private and public spaces in their dwellings, introducing intermediate semi-private spaces could offer advantages, particularly by exploring the potential of combining fishermen's transit living spaces as Airbnb accommodations and engaging in eco-tourism. Since the primary cause of the fishermen's low quality of life is their income, the primary emphasis should be on finding ways to create affordable, durable, and income-generating spaces.

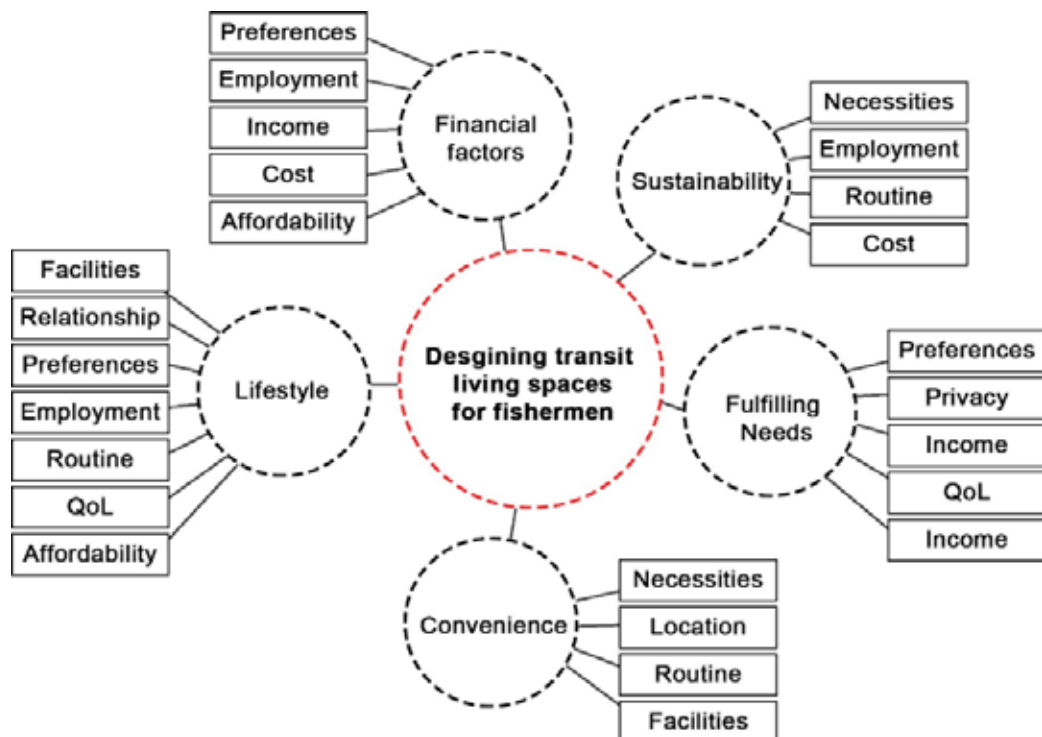


Figure.2 Framework to design transit living spaces for fishermen in Kuantan.

Source: Author

CONCLUSION

A framework for designing transitional living spaces specifically for fishermen in Kuantan has been introduced in this paper. Fishermen, who are often socially isolated, have been neglected in terms of architectural considerations for their well-being, lacking further exploration. With the advancements in architecture and architectural methodologies, there is a need to redefine the living spaces of fishermen settlements in order to improve their quality of life. According to the statistics from the Department of Fisheries Malaysia, there has been a continuous decrease in the number of fishing boats and fishermen over the past few years. However, there has been an increase in fish landings and seafood products. Considering this ethical perspective, it is an opportune time for architects to address this issue. The fishing industry in Malaysia is experiencing a decline overall, and fishermen themselves perceive it as lacking a future. Consequently, they are not inclined to recommend or encourage their children to pursue a career in fishing. Human needs, interests, living style and livelihood itself has been changing ever since the beginning. Over the years, living spaces have transformed from simple shelters to various types such as terrace houses, apartments, condominiums, and more recently, shared living settings. However, in today's world

where human-centered design is highly valued in the field of architecture, it is crucial to shift fishermen's livelihoods from traditional methods to a more inclusive and flexible approach. This is especially significant for a vulnerable and marginalized population that has limited options available to them. Taking this into account, the introduction of additional types of living spaces for fishermen, depending on the given framework, has the potential to offer them increased flexibility in making better choices. This could enhance their livelihoods both in their work environment and personal lives, providing them with the satisfaction of returning to their own comfortable shelter.

The outcomes of this study have the potential to impact the policies formulated by the Malaysian government, particularly regarding the incentives granted to fishermen. A range of incentives are currently being offered to support the resilience and progress of fishermen, such as housing incentives that encompass the construction of new homes, house renovations, and the establishment of new settlements. However, the existing housing program for fishermen lacks the provision of transitional living spaces, as it solely focuses on a single housing typology that lacks the characteristics of a transitional living environment. Thus, for the successful application of this framework, it is imperative to revise the incentives provided by the government to fishermen in Malaysia. To enhance the implementation, additional research could explore alternative methodologies and investigate different research approaches. Furthermore, it would be beneficial to conduct more extensive studies in various fishing communities across Malaysia, encompassing fishermen with diverse demographics.

Design implementation

The results of this study concerning transitional living spaces were integrated into the final thesis design programmed as fishermen's accommodations. This living solution was aimed at those fishermen who presently reside within the selected site area, with the goal of offering improved facilities in a more favorable environment. The design introduced two distinct types of accommodations on the uppermost floor of the building, with the purpose of placing living areas on the top levels to ensure sufficient privacy.

Type 1: Shared facilities

The primary concept behind a transitional living space for fishermen is to meet their basic needs, including rest, hygiene, laundry, prayer, meals, and entertainment. The idea of incorporating a shared facility floor aims to centralize these amenities in a convenient and easily accessible manner. Additionally, this typology places a strong emphasis on providing these facilities in a cost-effective manner, recognizing that affordability is a significant concern for fishermen.

Typology: Shared facility area. Spaces: toilet/ shower/ entertainment/ resting area/ meeting room/ pantry/ lockers/ surau. Capacity per day: 40 fishermen. Total slots: 80 fishermen. *Service provided registration basis ** No. of fishermen are expected to vary depending on their work schedule.

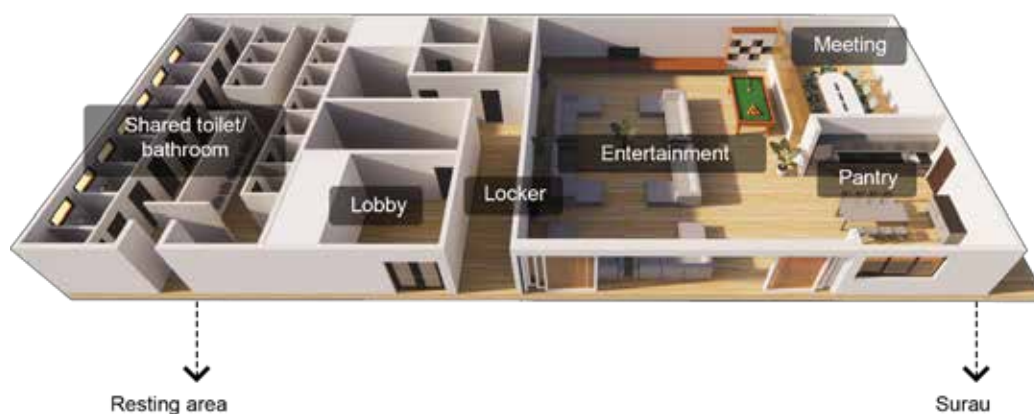


Figure.3 Transitional living space typology 1, shared facility area.
(Source: Author)

Type 2: Studio units

The second type of living spaces being proposed are studio units. The main objective of this proposal is to offer fishermen the option to rent smaller units at a lower cost compared to larger ones which is currently being offered as part of incentives by government. Additionally, this initiative aims to promote inclusivity among fishermen of various demographics by expanding the range of government subsidies available for housing.

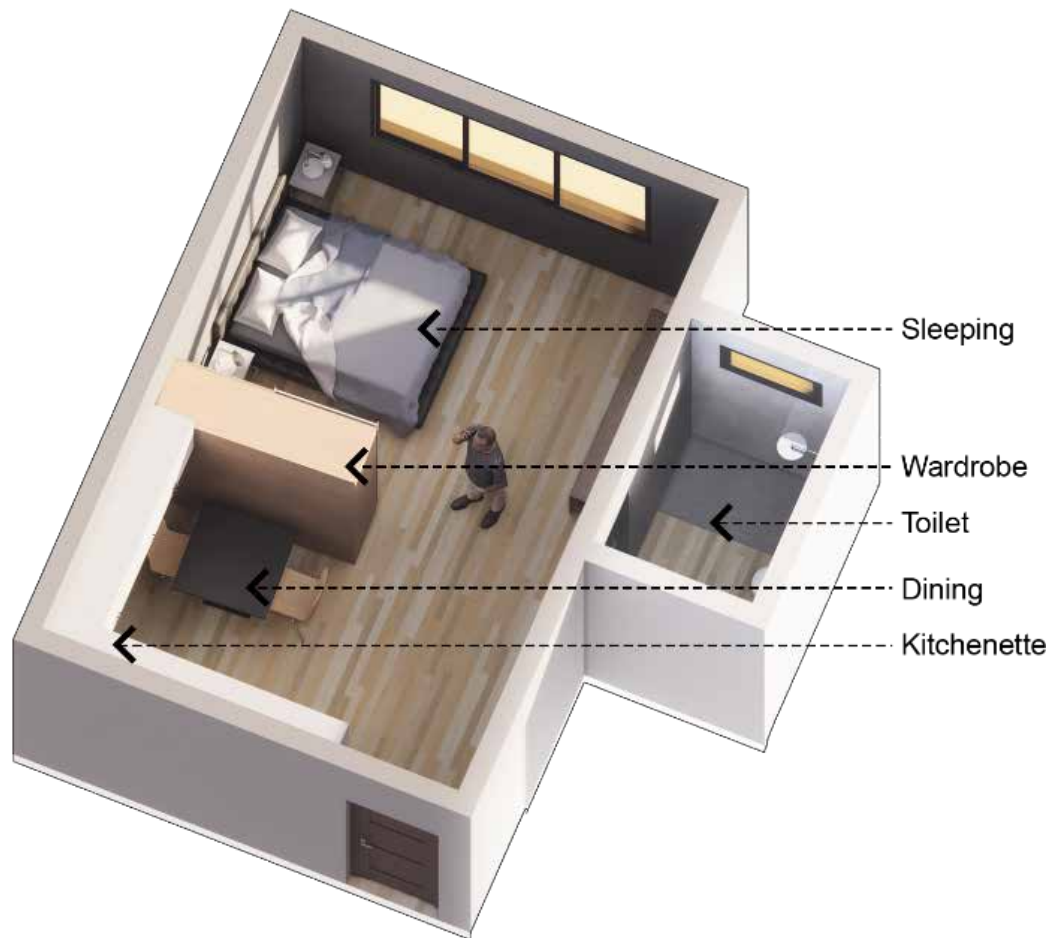


Figure.4 Transitional living space typology 2, studio unit. (Source: Author)

ACKNOWLEDGEMENT

Author would like to express heartfelt gratitude to advisor Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd. Noor for his unwavering support and strategic insights, and the participants for their invaluable contributions in this study.

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EXPLORATION ON INCLUSIVE SENSORY ARCHITECTURE FOR BLIND COMMUNITY IN MALAYSIA

Lim Jinq Ru, Noranita Mansor

ABSTRACT

Blind and visually impaired person are more adept in the sensation of hearing, touching, and smelling than their sight experience. As an architect, we should go beyond vision and explore the richness of the built environment through textures, smells, and sounds rather than only focus on its appearance. Enhanced the sensory architecture for the blind community. In Malaysia, the lacking of inclusive architectural solutions that are purposely designed for blind community, especially in the city and their dwelling place, they are mostly exposed to ground hazards nowadays. However, there are less or lack of technical architectural guidelines for inclusive design that response for blind community. Therefore, the research will investigate the integration of environment with the hearing, touching, and smelling senses to create inclusive spaces that improve the blind community independent lifestyle. In this research, it will conduct questionnaires survey on the challenges faced by blind community and their needs. This research will testing the efficiency of sensory architecture integration in term of life quality improvement for blind community. The study would provide a basic design guidelines on inclusive sensory design in future, it will benefits to locals and blind community in term of life quality improvements.

Keywords: *Blind community; inclusive design; sensory architecture; built environment; blind friendly*

INTRODUCTION

Malaysia has blindness and visual impairment rates that are comparable with other countries in the South East Asia region. As for Malaysia, approximately 1.2% of the population are experiencing blindness. Blindness and visual impairment are significant public health concerns in Malaysia, impacting individuals of all ages and socioeconomic backgrounds. Understanding the prevalence, causes, and challenges associated with visual impairment in Malaysia is crucial for developing effective strategies and policies to address this issue. This background study focuses on the challenges faced by visually impaired individuals in Malaysia specifically related to architectural design and highlights the importance of integrating sensory elements into the built environment to improve their mobility and overall experience.

Challenges Faced by Visually Impaired Community

Visually impaired individuals in Malaysia encounter various challenges in their daily lives. Accessibility remains a significant barrier, particularly in public spaces, transportation, and infrastructure. Besides that, visually impaired individuals encounter various challenges when navigating the built environment in Malaysia. The lack of accessibility features and inadequate consideration of their needs in architectural design exacerbate their difficulties. Employment opportunities and social inclusion for visually impaired individuals also pose significant challenges due to prevailing stigmas, lack of awareness, and inadequate support systems.

Blind community facing a lot of challenges in their daily life. According to Attia (2020), not only for adults, life independency and educational achievement for pupils with visual impairment concern the whole concept of special education. Environmental factors cause serious orientation problems for persons with visual impairment. The issue of environmental unfriendliness ran across

the responses given by the participants. This statement supports with Brady (2013). He mentioned, the challenges faced by blind people in their everyday lives are not well understood. Other types of challenges, such as those where a user needs help in a situation requiring conveying and/or receiving continuous information, are beyond the bounds of the current study. Thus, improve our understanding of the problems blind people faced, and may help motivate new projects more accurately targeted to help blind people live more independently in their everyday lives.

Besides that, according to Jeamwatthanachai (2019), a number of visually impaired people suffer from navigation related activities. To justify that, she mentioned due to mishaps that discourage them from going out for social activities and interactionsn contrast to outdoors, traveling inside public spaces is a different story, as many environmental cues cannot be used and have their own set of difficulties. However, technologies like accessible maps or indoor navigation systems are insufficient to fulfill the independent navigation gap as additional information is required (obstacles, barriers, and accessibility). Continued by Busaeed (2022), visually impaired people encounter many impediments and challenges in their lives such as related to their mobility, education, communication, use of technology, and others. He studied that to navigate outdoor environments, the respondents are depending more on accompanying persons (53%) vs navigating indoor environments (42%). This is expected given that the visually impaired may not be quite familiar with these outdoor environments.

According to Rector (2015), People who are blind or low-vision may have a harder time participating in exercise due to inaccessibility or lack of experience. Further discussed, people with more severe visual impairments are less likely to believe that exercise is important and are more likely to have parents who do not encourage them to exercise. However, most exergames and health tracking technologies have accessibility issues for people who are blind or low-vision because many of the necessary cues are visual.

Based on Malaysia current economic situation, various tasks are still inaccessible or have limited usability because the technology is not yet completely mature or the accessible products are too expensive. To establish and sustain these services requires comprehensive strategies that go beyond a narrow focus on surgical technique. Preventive interventions must be identified, perfected and delivered, through research, changes in government policy and legislation, and modification of community and individual behaviour.

Role of Sensory Architecture

Blind and visually impaired person are more adept in the sensation of hearing, touching, and smelling than their sight experience. Hence, the study will explores on how to integrate sensory elements in architectural design can greatly enhance the usability of spaces and create spaces and buildings that are more accessible and user-friendly for visually impaired individuals. The approach is to use a multi-sensory design approach. This approach involves incorporating various sensory elements, such as touch, sound, and smell, into the design of buildings and spaces. In addition, acoustic cues, such as sound-absorbing materials, can be used to create an acoustically-friendly environment. The intention is to show that sensory architecture integration can have a significant impact on the lives of visually impaired individuals. It can improve their ability to navigate through buildings and spaces, reduce feelings of isolation and anxiety, and increase their overall sense of independence.

Increasingly buried by the visual perception that instead grows in proportion to the spread of new technologies which aim to interact almost exclusively with the visual apparatus. Since blindness issue occurred within blind community, we should analyzes and re-proposes the non-visual perception inherent in the human being. According to Vermeersch (2011), the buildings architects design are multi-sensory in nature and much richer than the visual aspects that get most attention during the design process and discussions afterwards. To explain that, he mentioned persons who are visually impaired perceive the built environment very differently and pay more attention to

tactile, haptic, auditory and olfactory aspects. However, there have been some reactions against this visual bias both from within the architectural discipline as well as from the field of disability studies.

According to Jenkins (2015), environments are not simply places where people want to “access”, instead, they are where many of the occupations that fill people’s lives occur; they are the lexicon of culturally appropriate pursuits and pastimes that provide people with identity and fulfillment. The role of sensory characteristics embedded in the built environment and whether they support or hinder people with visual impairment in their use of public spaces. Further discussed, environments support associations between people and occupations, and contribute to a sense of familiarity and belonging to a community. However, within the Ecology of Human Performance the person is portrayed as entirely embedded in the context or environment, depicting an inseparable relationship between the two. Experience of multisensory environments from the perspective of people with visual impairment are not just supportive or inhibiting to their activity participation and engagement, but are also context-dependent.

According to Hadjiphilippou (2004), built environment, is an important part of our living conditions, affecting our experiences, feelings, memories, and ultimately the decisions we make. Smell, sound, touch and then taste are an essential order for the blind people in order to evoke mystery and hunger. To support that, he mentioned the ability to recognize the geometrical structure of the surrounding environment, awareness of self-location in surrounding space and determining in terms of depth and directions the location of nearby objects. However, the contemporary city has lost its sound due to numerous open spaces and the usage of artificial sound inventions.

The world of sensory perception has resulted in the design of some mediation tools that could expand the perceptual capabilities of all. With the diffusion of this prototype, the visitor or the curious of 2030, will have more mastery of his five senses and will know how to appropriate the space that surrounds him through their natural interpenetration. The potential of this material has been approved by a substantial number of blind witnesses, and it has been decided to carry out a real prototype of sensory tools to be proposed to the competent bodies with the aim of making the project usable in public spaces in the city.

METHOD

This research study was extrapolated in order to examine the challenges faced by the blind community and the opinion of the respondent with blind facilities through a series of questionnaire survey. A structured questionnaire geared specifically for the purpose of this research address relatively prominent variables with the suggestion on the improvements towards blind community in term of quality of life, built environment and inclusive design.

A research development strategy is used in the study to ensure that all related fields are thoroughly explored and systematically organized in manageable elements or stages stated below:

- Stage 1 : Determine the issues and problems faced by the blind community in Malaysia.
- Stage 2 : Literature review on inclusive sensory design and factors that affecting the built environment or quality of life towards blind community.
- Stage 3 : Data collection in designated population in Brickfields, Kuala Lumpur.
- Stage 4 : Data analysis, exhibition of findings and conclusion based on this research study.

From these procedural stages, the research follows a standard research framework. This conceptualization of the research, its theoretical foundation and how the foundation affects the construction of the instruments. Illustrated below is the flowchart of the research framework as portrayed by Figure 1.

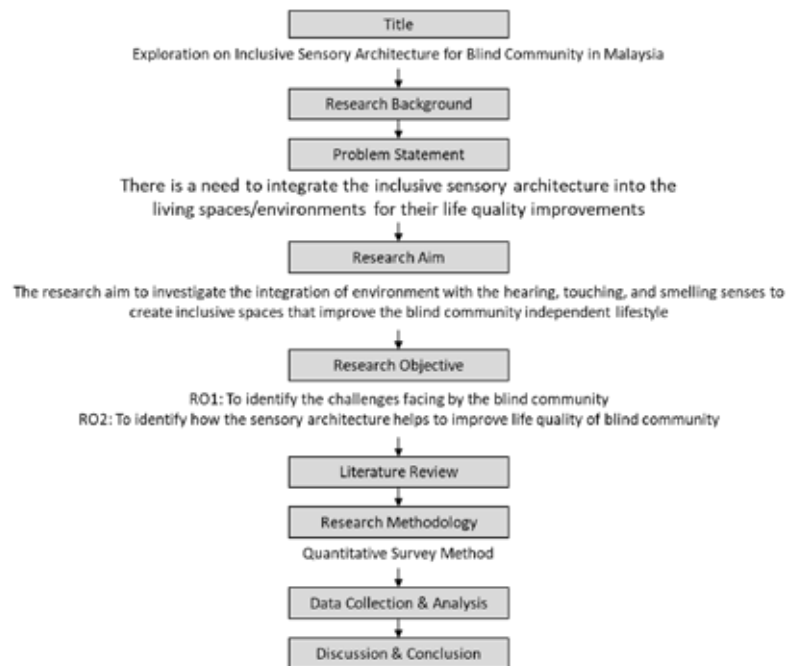


Figure.1 Research Framework

This research will using the survey method to collect the data. The study population will include members of the blind community and related employees who are 21 years old and above. The population will be limited to blind community or relevant staff who live 1km within the blind services or facility centres. A set of questionnaires will be distribute through field study.

The questionnaire will be divided into three parts. The first part is on demographic data. Second part is on the opinion of the respondent with blind facilities in Malaysia. Lastly, the final part is on the suggestion on the improvements of blind community daily life.

The data collection will be analyse by Microsoft Excel to identify the higher frequency on respondent preferred needs, facilities, space quality to improve life quality for blind community. Findings from this survey will be helpful to understand the criteria for developing the integration of sensory architecture into our environment that improve life balance between locals and blind community.

In order to construct a survey question, an extensive literature review was conducted, involving thorough research from various sources such as articles, journals, theses, newspapers, books, and online resources. This review aimed to gain comprehensive knowledge on the topic. The selection of appropriate survey questions was contingent upon a clear understanding of the research question and its objectives, with a particular focus on the built environment, inclusive sensory design, and the impact on the quality of life for the blind community, as discussed in the preceding chapter.

The questionnaires were divided into three sections. In the first section, the question was asked regarding respodents' demographic details which include background education, working status, marital status, income level and owned property status. These questions aim to determine the income group and responsibility level of the designated population. Such consideration is highly salient, as different income group and responsibility level could delimit the quality of life in different ways.

In the second section, the question was asked regarding the opinion from the designated population in term of blind facilities which including education facilities, transportation facilities, or any relevant facilities in Malaysia. These questions aim to determine the challenges faced by the blind community in their daily life. The built environment might be the key factor that affect quality of life towards blind community.

For the last section, the question was asked regarding the suggestion on the improvements of blind community in any relevant design aspect. These questions aim to determine how the inclusive

sensory design can be integrated with the built environment. It might helps to develop a strategic research design on the inclusive sensory design to identify the better quality of life for blind community.

Not to emphasize but to mention, all the constructs used in the questionnaire are valid constructs as some of it have been used by other researchers and studies that have been published before this. The sources and sequence of the questionnaire survey forms are shown as the Table 1 below:

Table.1 Survey Questionnaires and Item Validity as Indicated by Other Researchers

Variable	Dimensions	Section	Sources
Demographic Details	- Name & Gender - Age - Background Education - Working Status - Marital Status - Income Level - Owned Property Status	Section 1	N/A
Challenges Opinions	- Education Facilities - Transportation Facilities - Working Environment - Public Area - Living Area - Social Life	Section 2	References from:- Attia (2020); Brady (2013); Busaeed (2022); Rector (2015).
Improvement Suggestions	- Tactile & Wayfinding - Spatial Quality - Lighting & Contrast - Building Materials - User Experience & Participation	Section 3	References from:- Heuton (2008); Moore (2001); Kristin (2021); Geoffrey (2010); Walter (2015); Chaudary (2021).

RESULT AND DICUSSION

In order to engage in a meaningful and insightful discussion regarding the data and findings, it is crucial to initially comprehend the demographic background of the participants who were included as the sample for this study. A number of 59 participants over a period of 2 months were involved in this study. The primary focus of this survey is the end-users, who served as the primary data source. In Section 1, the participants were classified based on gender, age, educational background, employment status, marital status, and income level. Understanding the background of each respondent is crucial as individuals from different age groups tend to have varying perceptions and preferences. While many respondents may not possess an in-depth understanding of the theoretical concepts related to the built environment, their firsthand experiences as end-users play a vital role in identifying the challenges that impact their quality of life in daily activities.

The first demographic detail that is analyzed is the respondents' gender. Figure 2 shows the response rate of the individual survey, which was conducted through the distribution of questionnaires. The data reveals a higher percentage of male respondents, with n:39 (66.1%), compared to female respondents, with n:20 (33.9%).

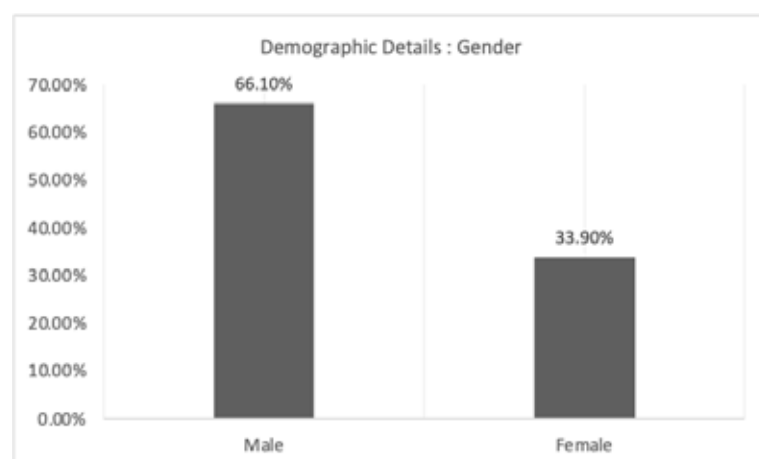


Figure 2 Demography According to Gender

Secondly, age is another demographic variable that should be looked upon. Figure 3 shows the individual age of the respondents. The figure indicated that most of the survey respondents are from age group between 31-40 at n:22 (37%), followed by second highest which is age group between 41-50 at n:17 (28.8%), followed by thrid highest which is age group between 51-60 at n:11 (18.6%), followed by age group between 21-30 at n:7 (11.8%) and the least age group which is 61 and above at n:2 (3%).

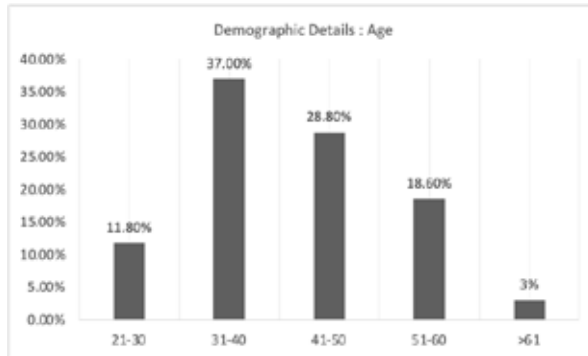


Figure 3 Demography According to Age

Education level is also a demographic concern. Figure 4 shows the distribution of the level of education of the respondents. The figure indicated that most of the respondents with n:31 (52.5%) have their SPM level. Followed by Diploma level n:14 (23.7%), Degree level n:8 (13.6%), STPM level n:5 (8%) and Master/PhD level n:1 (1.6%).

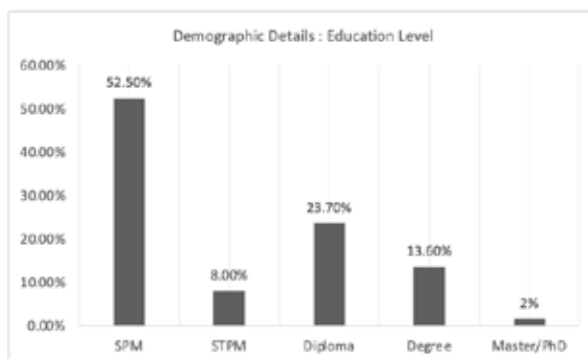


Figure 4 Demography According to Education Level

Working status also taking part of consideration in this research study. Figure 5 shows the distribution of the working status of the respondents. The figure indicated that the most of the respondents with n:29 (49.2%) working as part timer. While n:27 (45.8%) of respondents working as full timer and n:3 (5%) of respondents under unemployed.



Figure 5 Demography According to Working Status

Besides working status, income level also one of the consideration to be looked upon. Figure 6 shows the distribution of income level of the respondents. The figure indicated that most of the survey respondents are under RM2,500+ income level n:32 (54.2%), followed by RM3,500+ income level n:12 (20.3%), RM4,500+ income level n:9 (15.3%) and RM1,500+ income level n:6 (10.2%).

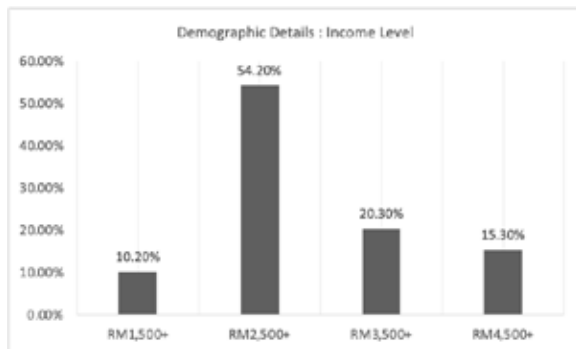


Figure 6 Demography According to Income Level

Lastly from Section 1, marital status is another demographic variable that should be looked upon. Figure 7 shows the distribution of marital status of the respondents. Most of the respondents are under single status n:25 (42.4%). Followed by married without kid status n:23 (39%) and married with kid status n:11 (18.6%).

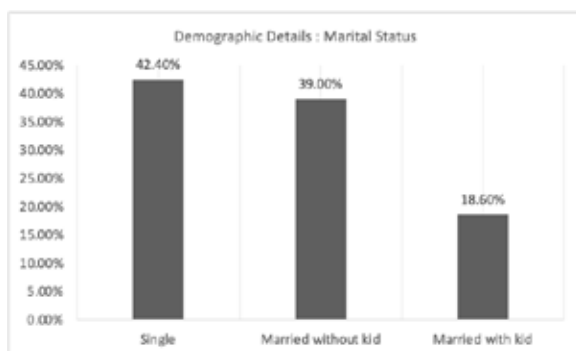


Figure 7 Demography According to Marital Status

Other than the individual demographic details, Section 2 focuses on the challenges faced by the blind community in both built environment and relevant blind facilities. List of challenges has been distributed through the questionnaire surveys. The design of the built environment, including public spaces, buildings, and transportation systems, can either facilitate or hinder the mobility and accessibility of blind individuals. Hence, this questionnaire section explores distribution of ratings on accessibility and wayfinding system, working environment, education facilities, transportation facilities and sociality in public area.

The first distribution of challenges to be rated is accessibility and wayfinding system for blind community. Figure 8 shows the distribution of ratings of the respondents. The figure indicated that most respondents rated unsatisfied n:40 (67.8%) for the current situation of accessibility and wayfinding system. Followed by n:15 (25.4%) rated neutral and n:4 (6.8%) rated satisfied.

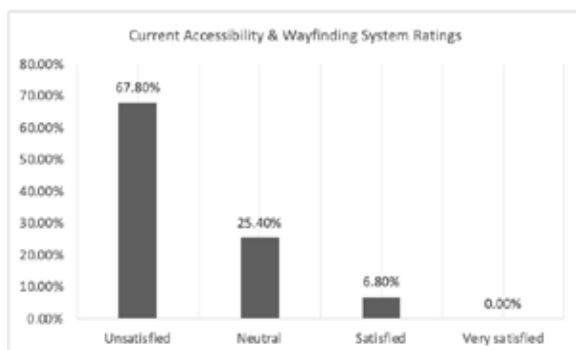


Figure 8 Distribution Ratings on Accessibility & Wayfinding System

Secondly, the distribution of challenges to be rated is working environment for blind community. Figure 9 shows the distribution of ratings of the respondents. The figure indicated that most respondents rated neutral n:26 (44.1%) for current situation of working environment for blind community. Followed by n:21 (35.6%) rated unsatisfied, n:9 (15.3%) rated satisfied and n:3 (5%) rated very satisfied.



Figure 9 *Distribution Ratings on Working Environment*

Besides that, the distribution of challenges to be rated is current situation of educational facilities for blind community. Figure 10 shows the distribution of ratings of the respondents. The figure indicated that most respondents rated satisfied n:23 (39%) for current situation of educational facilities for blind community. Followed by n:20 (33.9%) rated neutral, n:12 (20.3%) rated unsatisfied and n:4 (6.8%) rated very satisfied.

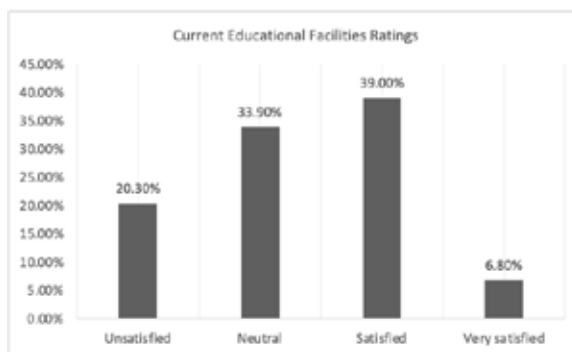


Figure 10 *Distribution Ratings on Educational Facilities*

In addition, the distribution of challenges to be rated is current situation of transportation facilities for blind community. Figure 11 shows the distribution of ratings of the respondents. The figure indicated that most respondents rated neutral n:29 (49.2%) for current situation of transportation facilities for blind community. Followed by n:19 (32.2%) rated unsatisfied, n:9 (15.3%) rated satisfied and n:2 (3.3%) rated very satisfied.

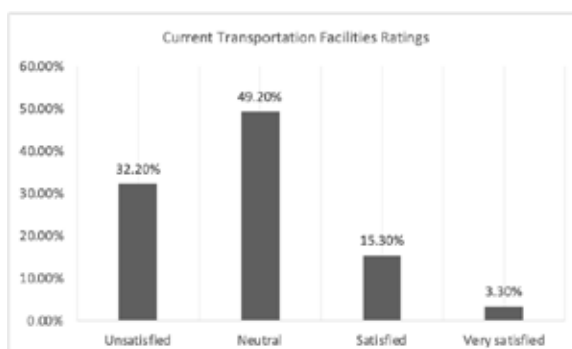


Figure 11 *Distribution Ratings on Transportation Facilities*

Lastly, the distribution of challenges to be rated is current situation of public area or open spaces for blind community to conduct sociality. Figure 12 shows the distribution of ratings of the respondents. The figure indicated that most respondents rated unsatisfied n:35 (59.3%) for current situation of public area or open spaces for blind community. Followed by n:19 (32.2%) rated neutral, n:4 (6.8%) rated satisfied and n:1 (1.7%) rated very satisfied.

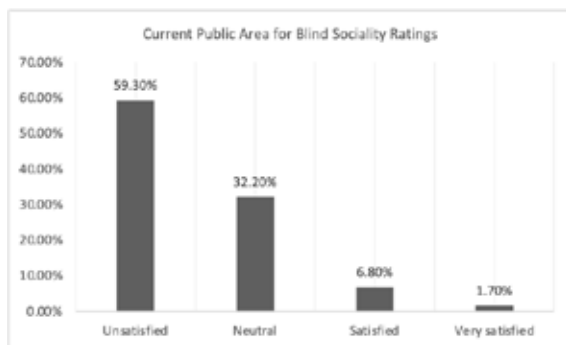


Figure 12 *Distribution Ratings on Public Area Sociality*

Section 3 in this questionnaire survey focuses on the improvements with the inclusive sensory design for the blind community. Not only for blind community, it might also be benefited by public from the improvements. This section will collecting the opinions from the respondents on which aspects they wished to be improved.

Inclusive sensory design has the potential to have a significant impact on the lives of the blind community, enhancing their independence, well-being, and overall quality of life. The following descriptive analysis highlights some of the opinions from the respondents in term of inclusive sensory design:

- i. **Improved Navigation and Wayfinding:** Inclusive sensory design elements, such as tactile paving, audible signage, and tactile maps, provide vital cues and information for blind individuals to navigate their surroundings independently and safely. These features enable them to better orient themselves, locate important landmarks, and navigate through public spaces with confidence.
- ii. **Enhanced Safety and Accessibility:** By incorporating inclusive sensory design, environments become more accessible and safer for individuals with visual impairments. Tactile cues, contrasting colors, and well-designed layouts help minimize physical hazards and barriers, reducing the risk of accidents and promoting a sense of security.
- iii. **Increased Independence:** Inclusive sensory design empowers blind individuals to carry out daily tasks and activities independently. By providing accessible features in public facilities, transportation systems, and urban environments, blind individuals can confidently engage with their surroundings, access essential services, and participate in social and cultural activities without relying heavily on assistance.
- iv. **Enhanced Social Inclusion:** Inclusive sensory design fosters social inclusion by creating environments that accommodate the needs of blind individuals. Accessible public spaces, inclusive buildings, and inclusive technologies enable blind individuals to participate more fully in community life, interact with others, and engage in social activities, leading to a greater sense of belonging and connectedness.
- v. **Improved Emotional Well-being:** Inclusive sensory design contributes to the emotional well-being of the blind community. By providing a more inclusive and accessible environment, individuals may experience reduced stress, increased self-confidence, and improved overall satisfaction with their surroundings.

These potential improvements demonstrate the transformative power of inclusive sensory design in creating environments that cater to the specific needs and abilities of the blind community. By prioritizing accessibility, safety, and independence, inclusive sensory design plays a crucial role in improving the overall well-being and quality of life for blind individuals, facilitating their full and active participation in society.

CONCLUSION

In conclusion, the findings and existing literature highlight that improving accessibility and wayfinding with sensory design is a key step in creating inclusive environments for the blind community. By incorporating tactile elements, implementing auditory signage, enhancing lighting and contrast, providing clear and accessible signage, utilizing wayfinding technologies, and involving blind individuals in the design process, we can create environments that empower blind individuals to navigate with confidence, independence, and a greater sense of inclusion. Through collaborative efforts among designers, architects, urban planners, technology developers, and the blind community, we can work towards creating a more accessible and inclusive world for all.

The existing literature and findings also highlighted that improving the workplace environment with sensory design is vital for promoting inclusivity, accessibility, and equal opportunities for blind individuals. By implementing tactile wayfinding, incorporating auditory systems and assistive technologies, considering lighting and contrast, promoting universal design principles, fostering a supportive culture, and providing accessibility training and resources, workplaces can become more welcoming and empowering for blind employees. Through collaborative efforts between employers, designers, human resources professionals, and blind advocacy groups, we can create work environments that allow blind individuals to contribute their skills and talents to the fullest extent, leading to enhanced productivity, job satisfaction, and overall workplace success.

By providing auditory learning materials, creating accessible digital content, incorporating multisensory learning experiences, optimizing classroom and navigation accessibility, fostering collaboration and communication, and offering teacher training and support, educational institutions can enhance the learning experience and outcomes for blind students. Through collaborative efforts among educators, administrators, designers, and the blind community, we can create educational environments that cater to the diverse needs and abilities of all students, promoting equal access to education and fostering their intellectual and personal growth.

In addition, improving transportation modes or facilities with sensory design is essential for promoting inclusivity and accessibility for the blind community. By providing clear and accessible information, enhancing wayfinding and navigation, improving physical accessibility, offering assistance and support, emphasizing safety measures, and seeking feedback from blind individuals, transportation systems can become more inclusive and enable blind individuals to travel independently and confidently. Through collaborative efforts between transportation authorities, designers, blind advocacy groups, and the blind community, we can create transportation environments that prioritize the needs of all passengers, fostering equal access to transportation and enhancing the overall travel experience for blind individuals.

Lastly, enhancing accessibility and navigation, creating multi-sensory experiences, fostering social gathering spaces, utilizing universal design principles, promoting sensory engagement, and involving the blind community in design processes, public spaces can become more welcoming and accommodating for blind individuals. Through collaborative efforts between designers, urban planners, policymakers, and the blind community, we can create public spaces that promote social interaction, inclusivity, and a sense of belonging for all individuals, regardless of visual abilities.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude and appreciation to those who have contributed to the completion of this research paper.

First and foremost, I am immensely grateful to my supervisor, Assoc. Dr. Noranita Mansor, for her guidance, expertise, and unwavering support throughout the research process. Her valuable insights, constructive feedback, and dedication have been instrumental in shaping this study.

I am indebted to the participants of this study, whose willingness to share their experiences and insights has made this research possible. Their contributions have enriched the findings and implications of this study.

I would like to acknowledge the support and resources provided by Universiti Putra Malaysia. The access to facilities, library resources, and technical support have been invaluable in conducting this research.

Furthermore, I would like to express my gratitude to my classmates and friends for their encouragement, stimulating discussions, and continuous support throughout this research journey.

Lastly, I am deeply grateful to my family for their unwavering love, understanding, and encouragement. Their patience, belief in my abilities, and constant motivation have been the cornerstone of my perseverance.

Although the list is not exhaustive, each individual mentioned above has played a significant role in the successful completion of this research paper, and for that, I am truly grateful.

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SUSTAINABILITY DEVELOPMENT IN BUILT ENVIROMENT

EXAMINING THE ARCHITECTURAL DESIGN APPROACH FOR THE DESIGN OF A SUSTAINABLE COMMUNITY-BASED AGRITOURISM CENTRE

Pang Jia Yi, Nor Azlina Abu Bakar,

ABSTRACT

Agriculture is vital to Malaysia's economy as it contributes 7% to 12% to the nation's GDP and employs about 16% of the workforce, and give a great impact on local tourism. Agri-tourism can help to reconstruct and redefine the tourism sector in a new and more sustainable way. Agriculture as one of the main contributor's economic developments has vast areas to offer tourists to feel the excitement from the farm and its resources. However, current government initiatives in promoting agritourism are less and the less organized structure of the agritourism business is also a barrier to its expansion. The research will conduct qualitative study through observation, desk review and interviews to understand the factors that contribute to the local agricultural tourism. This study will contribute to identify design framework that could recommend the ideal design approach that integrate agriculture into architecture to sustain local socio-economy. Future research can add more variable to the existing study on the design framework.

Keywords: Agritourism; design approach; sustainable; community

INTRODUCTION

The slogan "Malaysia, Truly Asia" has successfully portrayed and promoted the unique and valuable travel experiences available in this country, which boasts a culturally and geographically diverse environment (Lenka & Sarkar, 2014). Malaysia possesses a wide array of resources that have the potential to become distinctive tourism attractions. The government's initiative to utilize this platform for income diversification in rural communities has led to increased attention towards agrotourism, or agritourism, particularly among urban populations, over the past decade (Jaunis et al., 2022). Agrotourism in Malaysia focuses on tourism activities provided by local farm operations in four agricultural branches: agriculture, fisheries, livestock, and agro-based businesses, with the aim of boosting farmers' income (Jaunis et al., 2022).

Agritourism has emerged as one of the fastest-growing industries in the past decade. It is viewed as an innovative approach to increase the range of activities conducted on a piece of land, thereby boosting the productivity of agricultural regions (Jaunis et al., 2022). Agriculture holds significant importance in Malaysia's economy, as it does in many developing countries, accounting for a substantial portion of the GDP ranging from 7% to 13% between 2000 and 2020. It also provides employment opportunities for approximately 16% of the workforce (The World Bank, 2023). Agritourism was introduced in Malaysia in 1991 as a means to support farmers in rural areas. However, progress in this sector has been considered slow and lagging behind neighboring countries like Thailand and the Philippines (Jaunis et al., 2022).

AGRITOURISM FOR SUSTAINABLE RURAL DEVELOPMENT IN MALAYSIA

In scenarios where individuals are confined within limited urban spaces during disease outbreaks, it becomes an opportune time to explore agritourism and engage in activities such as visiting ranches, working farms, or agricultural enterprises. These activities not only provide educational experiences for visitors but also generate additional income for the proprietors. In recent years, agritourism has gained popularity among tourists seeking to immerse themselves in rural cultures. The agricultural sector plays a crucial role in the Malaysian economy, contributing significantly to the GDP and offering employment opportunities (The World Bank, 2023)

Furthermore, the agricultural industry has a significant impact on the local tourism sector. With agritourism integrated, the tourism sector can be reconstructed and redefined in a more sustainable manner. Agritourism has been recognized as a viable and sustainable form of tourism by the (Ministry of Tourism Arts and Culture Malaysia (MOTAC), 2020). It has the potential to enhance the economic viability of agriculture as a rural economic sector through tourism. Moreover, agritourism facilitates the emergence of rural entrepreneurs and promotes the establishment of dynamic rural tourism corridors (Yeo, 2021). While the government has made efforts to promote agri-tourism, the growth of food production remains sluggish and stagnant (Azuar, 2021). The participation of nearby village communities is crucial to ensure the success of the program and the well-being of the local population, as many agritourism activities are closely linked to rural areas.

The National Tourism Policy 2020-2030 recognizes agritourism as one of the sustainable forms of tourism. It not only adds value to agriculture as a rural economic sector through tourism but also encourages the development of rural entrepreneurs and vibrant rural tourism corridors (Yeo, 2021). Given the significant role of agriculture in economic development, the sector offers ample opportunities for tourists to experience the excitement of farm life and its resources. However, there is a need to study the architectural approach in designing sustainable community-based agritourism centers that involve local village or rural communities, as the current structure of modern cities limits social interaction and experiences with the built environment and nature. Such studies are important to ensure the success of the program and the well-being of the local community (Azuar, 2021).

AGRITOURISM AND COMMUNITY DEVELOPMENT

The word “agritourism” refers to practically all activities in which a visitor to a farm or other agricultural location views the farm landscape or participates in an agricultural operation for enjoyment or leisure purposes (Pavić et al., 2018). Besides, agritourism usually includes a variety of activities, such as daily visits, recreational self-harvest, hunting and fishing for a fee, nature and wildlife observation, and other outdoor activities. Agritourism is a sustainable form of tourism that is frequently integrated into regional development and strives to promote rural capital while stimulating local economies.

While the potential benefits that agritourism towards local community, agritourism can help to solve difference in economic problems through economic diversification, employment creation, protection and improvement of both natural and built environment, and infrastructural improvements (Tiraieyari & Hamzah, 2011). The potential of agritourism towards tourists are agricultural areas which have tourist attractions are able to form the basis for relaxation, enjoyment, and education of tourist. Additionally, it gives the tourist a chance to interact directly with the local population, explore the region, and gain an appreciation for the people, culture, and nature of the region (Tiraieyari & Hamzah, 2011)

In order to ensure that any planned project fits the needs of the community, rural tourism implicitly acknowledges a slow and organic growth process that is directed by the local community (Singh et al., 2022). Agritourism should be community-driven and allow for organic growth that is gradual in order to make the best use of the region’s limited resources, capabilities, and competencies while minimising interruptions to daily life.

In recent decades, rural communities have experienced profound changes, primarily a shift in economic activity and population to urban areas, as well as a decline in the importance of agriculture as the most important sector in terms of production, wealth, and employment (Ammirato & Felicetti, 2013). Farmers are continually seeking innovative approaches to conduct their business, exploring various economic strategies to determine their feasibility. With consumers’ escalating demand for high-quality, safe, healthy, and ethically acceptable food, there is a growing consensus that traditional agriculture is no longer sustainable and that fundamental changes are necessary.

The presence of architecture on an agro-tourism site is always a supportive element in developing agritourism centres. Either through agritourism administered by a farming community or through agrotourism handled by government agencies and the corporate sector. Recognizing the significance of the relationship between an agro-tourism and the design and character of the

architecture included therein, the layout of an agro-tourism in order to do the continuous existence visited by travelers may be done via excellent judgement. Because a well-organized agro-tourism site will provide visitors with aesthetic value, comfort, happiness, and a lasting memory while participating in tourism activities (Bt & Nur, 2012) the types of tourism, and the land use of the site into consideration. This thesis aims to study the design and the character of architectural found on the agro-tourism site in Indonesia with identify the suitability of the tourism types which have been developed successfully elsewhere, such as the BOH Tea Centre at Cameron Highland (Malaysia). Therefore, agritourism site that have real agricultural activities should not be affected by the presence of excessive architectural design, or getting confuse by any other activity that is not related with agriculture activity.

Basic facilities and infrastructures should have in the agritourism farm (Annamalah, 2016), such as accommodation facilities, near to resources (water and plant), cooking equipment, emergency medical care, and entertainment facilities (swimming pool). It also stated that site should offer pollution free environment to tourists, create interest about the village to create future tourism business, employ well-trained staff or person with good communication skills.

Besides, a general guideline for an agritourism is identified based on the study of design and character of the architectural in agritourism site (Bt & Nur, 2012). First, an agro-tourism site is a unit consisting of agricultural activity rather than one or a few farm-related animals or plants, or both, in an agricultural area that is carried out collaboratively by a community as well as private and government entities. Next, it is appropriate when the agro-tourism activity is tied to agriculture, which planting, preservation, harvesting, processing, and sales are examples of these activities. Activities that are not related to agriculture are naturally excluded from the agenda of activities at an agro-tourism site. Including outbound activities or other extreme activities, games (such as theme parks and water games), and other activities whose sole purpose is to provide tourists with a variety of activities other than farming operations. The attempts to construct a building and other forms on an agro-tourism site should take into account the design and character of architecture that will not clash with the agro-tourism site's function. Avoid constructing an architectural design that is unsuitable for an agro-tourism site.

Lack of sustainable practice act as the reason cause the highland areas to degrade and the incentives for agriculture increases align with unequal benefits for locals. Therefore, community involvement of community in decision-making and community involvement in tourism benefits sharing should be take into account before a person started to develop an agritourism centre (Ariffin & Yen, 2017).

METHOD

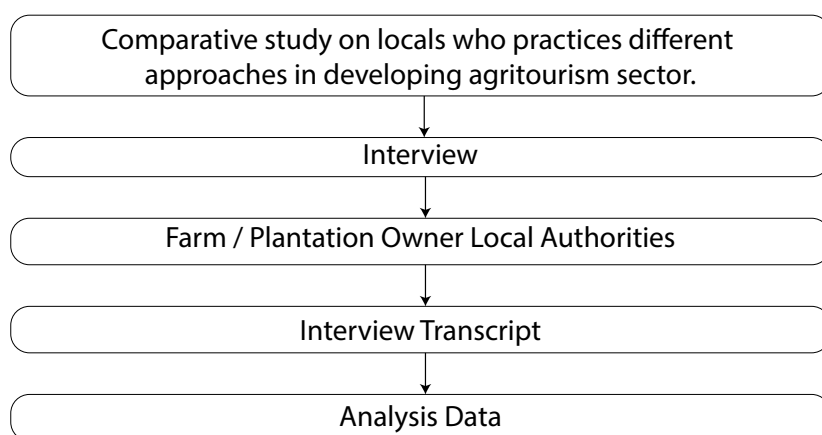
This study applies interpretivism as basis as sustainable community-based agritourism centre that contribute to local community is subjective and sustainable design approach will create a wide range of possibilities.

The research paradigm encompasses the epistemological dimension of comprehending the scenario of sustainable architecture for agritourism centre. The research methodology used in this study is through comparative study to achieve the Research Question 1 - How agritourism can contribute to improve the well-being of local community, and Research Question 2 - What is the ideal design strategy to integrate agriculture tourism towards a sustainable community-based agritourism centre. To effectively explore this subject, a qualitative approach has been employed in this study, employing various methods including desk review, in-depth interviews, and thematic analysis. These methods collectively form a comprehensive procedure for developing an appropriate a design framework.

It is important to note that the selection of these individuals as respondents is critical to the validity and reliability of the data gathered through the interviews. The study was conducted using purposive sampling, with the aim of incorporating participants who embody a diverse range of viewpoints pertaining to the agritourism industry. For the purpose of data collection, the researchers selected the local communities and authorities of Raub town as the primary source of data. These respondents possess valuable experiences in the development of the agricultural and tourism sectors of Raub town, thereby providing a better understanding of the research question.

The interview inquiries have been divided into two distinct research questions. The first research question (RQ1) concentrates on the potential of agritourism to enhance the well-being of the local community. The second research question (RQ2) is centred on identifying the best possible strategy for the integration of agricultural tourism within a sustainable community-based agritourism centre. Potential plantations and farms in the study area were identified and experienced workers working there were contacted through telephone, physically, and by email to confirm their willingness to participate in the interview, having retrieved a detailed list from the online database of local authorities, direct phone calls and personal contacts were made, and participants were reminded at least once to further confirmation before the interview.

Figure.1 Research Methodology Process



Source: Author (2023)

The outcomes of the interview session were documented and converted into written form. The processed data are subjected to manual analysis through thematic analysis in order to summarize and identify the prevalent themes that emerge from the interview responses, ultimately yielding the final outcome. Thematic analysis is a commonly utilized approach for organizing and analyzing qualitative data in research investigations. In order to streamline the examination process, the investigator employed a thematic analysis matrix, which is typically presented in the format of a table or spreadsheet.

RESULT AND DICUSSION

This study analyses the response from the in-depth interview and data collected during the conversation and field observations to investigate the potential and challenges of developing agritourism sector in Raub. The transcriptions of the interviews are analysed as supportive data, and a thematic analysis matrix is utilized to organize the identified codes and develop themes from them. Subsequently, results were tabulated into deductive codes, and the respective characteristics were identified to conclude the final theme.

Table.1 Thematic Analysis Matrix

Main RQ: What is the architectural design framework to promote agritourism that contribute to the well-being of local community? Aim of research: To study the roles of architecture in designing a sustainable community-based agritourism centre that contribute to local community. Informants: 1 local authority, 1 officer from agriculture and tourism department, 3 locals that involve in agricultural and tourism sector				
Research Question	Deductive	Strategy of inquiry	Inductive codes	
			Coding	Final theme (New Theory)
Sub RQ1: How agritourism can contribute to improve the well-being of local community?	Potential of agritourism	In-depth Interviews	· Business engagement · Exposure · Local products · Government Support · Culture · History · Economy · Social · Mental · Environmental · Job Opportunity	Theme 1: Economic Focus Theme 2: Cultural and Historical Factors Theme 3: Social and Mental Well-being Theme 4: Environmental Considerations
	Well-being of local community	In-depth Interviews	· Pollution · Employment · Food supply · Obstacles · Waste management · Maintenance cost · Knowledge and experience · Local engagement · Basic Facilities and amenities · Water resources · Electrical supply · Accessibility	Theme 1: Environmental Factors Theme 2: Infrastructure and Resources Theme 3: Socio-economic Factors
Sub RQ2: What is the ideal design strategy to integrate agriculture tourism towards a sustainable community-based agritourism centre?	Design Approach	In-depth Interviews	· User Activities · Spaces · Guidelines · Requirements · Planning · Safety · Strategies · Sustainable aspects	Theme 1: User-Centric Factors Theme 2: Planning and Management Theme 3: Sustainability Focus

Source: Author (2023)

The data collected is the divided into distinct categories to enable focus analysis. Each coding is classified into various themes for each sub RQ and thus final themes are generated. The transcribed data in each research question are analyzed by categorizing the responds into deductive codes. These codes are put together to identify the common pattern or themes before concluding them into a final theme.

Based on the research question 1, findings from the interviews highlight the varying themes for the deductive of sub RQ 1. Themes that emerged from the interview to answer the deductive 1 - Potential of agritourism are “Economic Focus”, “Cultural and Historical Factors”, “Social and Mental Well-being” and “Environmental Considerations”.

The first group of themes is about the potential of agritourism development in rural areas whereby the questions provided aims to identify the opportunity of agritourism that could bring towards the local society. From the findings, agritourism has the potential to make a significant contribution towards enhancing the well-being of communities around it through various means.

The respondents identified the presence of agrotourism in the area offers several benefits. Local farmers in FELDA have access to a variety of fruits that they can supply to visitors, which not only helps to diversify the local economy but also provides additional income for the farmers. However,

some farmers face challenges such as managing the workload and increasing costs of fertilizers. Nonetheless, the presence of agrotourism brings the potential for increased visitors to the farms, leading to additional income opportunities. Moreover, agricultural products can be sold to tourists, and downstream products can also be developed. The majority of participants concurred that enhancing the interaction between agricultural operators and neighboring communities would have a positive impact on the regional economy. This is due to their role in promoting local food and products to visitors. Overall, agrotourism contributes to improving the local economy, creating job opportunities for the younger generation, and promoting local products to visitors, thereby benefiting the community.

Additionally, agritourism can help expose people to the unique culture and history of the area, providing a deeper sense of connection and pride among community members. Agritourism offers tourists the opportunity to not only enjoy agricultural products but also learn about the local community's culture. The local community is also willing to share their knowledge and provide support to visitors or friends who are engaged in similar activities. This exchange of knowledge and support enhances the experience for visitors and fosters a sense of collaboration within the agrotourism community.

Agritourism provides an opportunity to share farming knowledge and other information with visitors, fostering a sense of community and collaboration. It also serves as a way for people in the city to release tension and find relaxation for their minds and bodies. Engaging in activities like tea leaf and strawberry picking allows people to connect with nature and experience a sense of calm and peace. Furthermore, agritourism is seen as a bridge for promoting mental health and environmental well-being, offering an alternative to medication for those struggling with depression and providing a holistic connection between agriculture, health, and the environment.

On the other hand, themes that emerged from the interview to answer the deductive 2 of sub RQ 1 – Well-being of local community are “Environmental Factors”, “Infrastructure and Resources”, and “Socio-economic factors”. From the findings, agritourism has the potential to make a significant contribution towards enhancing the well-being of communities around it through various means. According to the respondents, if agricultural development is not properly managed, it can lead to environmental pollution. In tourism areas, the presence of trash and rubbish can negatively impact plants and the ecosystem. In Raub, the extensive carving of mountains for durian plantations and the heavy use of pesticides, herbicides, insecticides, and chemical fertilizers are considered unsustainable practices. These practices can harm the soil microbes and create difficulties for farmers in growing crops, leading to a reliance on more chemical fertilizers.

Additionally, it is noted that some farmers even discard their produce, which is illegal but often goes unreported. These issues highlight the importance of sustainable agricultural practices and proper waste management to mitigate environmental pollution and food waste. Findings from interview also portray that if agricultural development is not properly controlled from the beginning, it has the potential to cause environmental pollution. On the other hand, agricultural products have the ability to generate employment opportunities. However, due to traditional perceptions, the agricultural sector is often associated with lower levels of education. Youngsters lack exposure to knowledge and experience in running agricultural businesses, which hinders their ability to start and manage farms. Nevertheless, upgrading and renovating the infrastructure, establishing farmer's markets or artisan markets which could provide a platform to sell local products like rambutan or Raub's famous Musang King durians. Additionally, the availability of a clean water source is essential for agritourism to thrive.

In terms of socio-economic factors, agriculture is a critical sector that ensures the continuous growth of the country's food supply and maintains an uninterrupted supply chain, according to an officer, therefore, agritourism is seen as an opportunity for visitors to connect with nature. By engaging in agritourism activities, people gain knowledge about the origin of their food, the nature of the soil, and the importance of such understanding for children's education. It is emphasized that tourism plays a significant role in reconnecting people from urban areas with the

source of their food, challenging the notion that health comes solely from packaged products or pills. Sustainability and creativity are identified as key aspects to focus on in the development of agritourism, providing a unique selling point for rural areas close to nature. On the other hand, a strong sense of community among local farmers and community able to offer mutual support and assistance to each other in times of need.

Based on the research question 2, findings from the interviews highlight the varying themes for the deductive of sub RQ 2. Themes that emerged from the interview to answer the deductive 1 - Potential of agritourism are “Design Approach”, “Planning and Management”, and “Sustainability Focus”.

From the findings, it is suggested that user-centric factors should be taken into consideration during the planning and design stages. The inclusion of activities and spaces that appeal to youngsters, such as a glamping area, campfires, and recreational area, provisions for relaxation, such as meditation and enjoying the viewing deck, should be considered when designing an agritourism centre that fulfill the needs of all ages. The idea of a night bazaar with various attractions and cultural streets is proposed to promote the diverse culture of local community as well as provide a marketing space for the community to sell their local produce. Lastly, locals recall past successful activities, such as fireworks shows, fruit festivals, and night bazaars, which added vibrancy to the area and showcased its historical values.

It is noted that tourists seek not only plantation visits but also other amenities such as food, accommodation, and scenic spots. Creation of spaces where visitors can experience the growth and harvesting processes of fruit trees and engage in food processing using local ingredients. Essential facilities mentioned include toilets, a café, and a small souvenir store selling seeds and flowers. However, accessibility is identified as a major challenge, as maintaining the jungle roads requires significant time and financial resources.

Besides, PLAN Malaysia of the State of Pahang has prepared guidelines and permission methods for planning, specifically addressing soil work, land cutting for hillside agriculture, discharge of sewage wastewater from agricultural activities, and the need for buffer zones between agricultural activities and water sources. Agricultural development can be successfully achieved if it adheres to these set guidelines. However, it is highlighted by a local that land legalization is a significant issue, as many farmers do not have legal land ownership and rely on government land for their plantations. In terms of site development, considerations include accessibility and potential visitor flow. The ideal location for agritourism is near a clean water source, and the involvement of soil and water testing, and the establishment of buffer zones to prevent contamination from neighboring farms using pesticides are also the factor of considerations in developing agritourism sector. The importance of considering land conditions, including suitability for construction, concerns of landslides, and the availability of basic facilities, water, and electricity supply. Some of the respondent believe that education is the way to promote and develop agritourism sector. Therefore, the establishment of a college or training center to guide individuals interested in running the agritourism industry.

Furthermore, agritourism sector encourages residents to take care of the environment and exhibit behavior that welcomes agricultural products and tourists. They also promote the 3R (Reduce, Reuse, Recycle) recycling program. Respondent also stated that the revitalization of soil through composting and mulching to ensure its fertility and health. The idea of integrating recycling centers in schools and implementing waste sorting in retails and restaurants is suggested, as it can create job opportunities and promote education. The agritourism center’s construction materials and infrastructure should implement the use of natural materials such as timber or wood, which is preferred to evoke a sense of closeness to nature, and the incorporation of sustainable practices like solar panels, rainwater harvesting tanks, and the use of natural materials, which is desired to minimize harm to the environment.

CONCLUSION

Architectural design plays a crucial role in agrotourism areas as it directly or indirectly supports agricultural activities. The main purpose of visitors in agrotourism areas is to observe, learn, and even participate in farming activities alongside the local farmers. Therefore, the presence of well-designed architecture is desirable to facilitate these experiences for visitors. The design of agritourism centre should incorporate architectural design that aligns with its purpose and is essential for the site. The design should consider of the local culture, climate, available technology, and materials. This ensures that the buildings blend harmoniously with the surroundings and provide benefits to the local community and users. The architecture follows a natural and community-oriented approach that suits the cultural development and environmental context of the area.

In general, based on study of the potential benefits and character of the architectural approach in agritourism site of Raub, the research has portrayed a general approach and consideration for an agritourism centre that could benefit the local communities:

- A. There is a need to focus on the potential of agritourism development in rural areas, recognizing the benefits it brings to local communities and the economy.
- B. The interaction between agricultural operators and neighboring communities is seen as crucial in promoting local food and products.
- C. Agritourism also provides an opportunity for cultural exchange and collaboration within the community. Night bazaars and cultural streets are suggested to showcase the local culture and create marketing opportunities for the promotion of local products.
- D. Education and knowledge sharing play a significant role in agritourism, allowing visitors to learn about the origins of their food and promoting mental health and well-being. The activities conducted in an agro-tourism site should be closely tied to agriculture. These activities encompass planting, preserving, harvesting, processing, and selling agricultural products. Additionally, educational training focused on the agricultural practices specific to the area is included.
- E. Design considerations include user-centric factors, catering to different age groups and providing amenities and activities that is appropriate in agritourism site that is related to agricultural activities like glamping areas, recreational spaces, and relaxation areas.
- F. When constructing buildings and other structures in an agritourism site, it is important to consider the design and architectural characteristics that align with the site's function. The design should avoid conflicting with the purpose of the agritourism site the architectural character should be influenced by factors such as culture, climate, environment, materials, and technologies. It should also be adaptable to contemporary needs and serve the function and benefits of the agritourism site
- G. Accessibility and infrastructure, including clean water sources, are important considerations. The use of natural materials and sustainable practices like solar panels and rainwater harvesting is desired to minimize harm to the environment.
- H. Guidelines and permission methods for planning have been prepared to ensure responsible development. Land legalization and ownership issues need to be addressed, and the establishment of a training center for interested individuals is proposed.
- I. The promotion of environmental care and the implementation of the 3R recycling program are encouraged.

These criteria serve as the foundation for the local community or anybody interested in operating an agritourism business, and they should be considered while establishing the construction design for the agritourism facility that focuses on enhancing local community well-being.

As a contribution to knowledge, this research has resulted a general approach pertaining to the activities and the architecture of agritourism site, as well as the contribution of agritourism towards well-being of local community. This study will also contribute to the government's commitment to achieve the National Tourism Policy (NTP) 2020-2030 to ensure the continuity of the country's tourism industry, making Malaysia one of the top tourism destinations in both arrivals and receipts.

ACKNOWLEDGEMENT

The author would like to express sincere and special gratitude to advisor Dr. Azlina Abu Bakar, respondents from Majlis Daerah Raub and Pejabat Daerah dan Tanah Raub, as well as interview respondents from local community for their invaluable participation and insightful feedback on this study.

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EXPLORING THE CRITICAL ROLE OF URBAN FARMING IN LOW-COST HOUSING TOWARDS SUSTAINABLE WELL-BEING

Lye Suchin, Zalina Shari, Mohd Zairul Mohd Noor

ABSTRACT

Urbanisation has resulted in an insufficient food supply in cities due to the high-density population. The COVID-19 pandemic impacted the food supply chain when the Movement Control Order (MCO) policy was implemented in Malaysia, resulting in panic buying due to food shortage. The pandemic caused around 49 million people to enter poverty in 2020, and food insecurity significantly impacts low-income families. The Malaysian government has created low-cost housing for the low-income group. However, despite the need for urban farming in Public Housing Projects (PPR), there are still challenges that the residents face. Therefore, the research aims to formulate a sustainable urban farming design framework for PPR housing to address food insecurity and improve residents' social well-being among urban dwellers in Selangor, Malaysia. Specific objectives are 1) to investigate stakeholders' perspectives on the conditions, challenges, and residents' satisfaction with PPR housing in Selangor and 2) to explore the potential success of integrating urban farming initiatives in such housing. Interviews and case studies of similar complexity phenomena with urban farming in Selangor were conducted. The findings revealed the gaps in creating a comprehensive scheme of more accessible fresh produce for low-income families and a more resilient and sustainable food system that promotes the well-being of all community members. This study is anticipated to address social problems of food security, urban poverty, and high living cost among urban dwellers in Malaysia.

Keywords: food insecurity, food supply, low-income families, urban farming, Public Housing Projects (PPR)

INTRODUCTION

Background Study

The food security issue in Malaysia is now a global concern. The COVID-19 pandemic impacted the food supply chain when the Movement Control Order (MCO) policy was implemented in Malaysia, resulting in panic buying due to food shortages. Measures of lockdown had prevented the nation from importing sufficient food to meet local demand. Even more, the closure of restaurants, hotels, and other food-related businesses due to lockdowns has caused a shift in food demand, increasing food prices. The pandemic caused around 49 million people to enter poverty in 2020 (Mahler, 2020). In the lead-up to the outbreak, some Malaysians already suffered from limited access to affordable, nutritious food and healthcare due to poor infrastructure and household income. The restrictions imposed during the COVID-19 pandemic caused consumers to be further impacted by the lack of availability of food and products in the market, leading to several challenges to the food supply.

Currently, issues of food shortage and increasing food prices are common in mass media, which is the aftermath of COVID-19 we are experiencing. The official portal of the Department of Statistics Malaysia (DOSM, 2022) may seem most reassuring in its report dated 26 August 2021 about the state of and plans for crops, livestock, and fisheries industries. However, we witness increasing numbers of citizens in the bottom 40% (B40) income group splitting hairs to pay for daily sustenance (J.D.Lovrenciar, 2022). The B40 group, which makes up approximately 40% of

the Malaysian population, typically has a lower income and fewer resources to cope with rising prices. The rising food prices in Malaysia significantly impact the B40 income group, as they spend more of their income on food.

To address this issue, the Malaysian government has implemented various programs and initiatives aimed at helping the B40 group access affordable and nutritious food. The initiatives include implementing price control measures for essential food items, providing financial assistance to farmers and producers, and distributing food aid to needy people (Rozhan et al., 2021). The government has also launched initiatives to increase food production and reduce food waste, which can help stabilise food prices over the long term. Overall, the impact of rising food prices on the B40 group in Malaysia highlights the importance of addressing this issue and ensuring that everyone has access to affordable and nutritious food.

Problem Statement and Research Gap

Motivational Problem

The B40 income group, living in People's Housing Project (PPR) housing, and food insecurity are discussions closely relatable in Malaysia. In Malaysia, food insecurity affects a significant portion of the population despite the country's status as a food producer and exporter. Like the B40 group, residents of PPR housing, typically low-income earners, face similar challenges in accessing affordable and nutritious food. The Sun Daily newspaper (Ali, 2022) stated that the consumer association had advised Malaysians to grow vegetables to counter the effects of recent vegetable price increases.

The Ministry of Housing and Local Government (KPKT) launched the National Community Policy (KPKT, 2011) to enhance the residents' quality of life in PPR. Among the community-empowering programmes carried out is urban farming. This type of agriculture is becoming increasingly popular in urban areas to promote sustainable food production, improve access to fresh and healthy foods, and create green spaces within cities. Urban farming in PPR housing can take many forms, such as community gardens, rooftop gardens, and vertical gardens. The type of urban farming most suitable for a PPR housing community depends on the available space and resources and the local regulations and zoning laws (Islam and Siwar, 2012).

Despite that, urban farming in PPR housing requires a cooperative effort from the residents, local government, and other stakeholders to succeed. This collaboration can include securing funding for necessary equipment and materials, developing a water and waste management plan, and providing training and support for the farmers (Rozhan et al., 2021). The Ministry of Housing and Local Government (KPKT) launched the National Community Policy (KPKT, 2011) to enhance the residents' quality of life in PPR. Among the community-empowering programmes carried out is urban farming. This type of agriculture is becoming increasingly popular in urban areas to promote sustainable food production, improve access to fresh and healthy foods, and create green spaces within cities. Urban farming in PPR housing can take many forms, such as community gardens, rooftop gardens, and vertical gardens. The type of urban farming most suitable for a PPR housing community depends on the available space and resources and the local regulations and zoning laws (Islam and Siwar, 2012).

Research Problem

Food insecurity is a common problem among low-income households in Malaysia. Sharif and Ang (2001) stated that 65.7% of low-income households in Kuala Lumpur experienced some food insecurity. Hence, to increase the supply to demand with affordable food prices, the agriculture sector needs to produce more food from less land to be self-sufficient and attain food security. In Malaysia, this approach has even more significant potential to improve the well-being of its residents as it is an economical and efficient method to provide affordable food for low-income communities (Erickson and Andrews, 2011), such as PPR housing. By growing their food, residents of PPR housing communities can save money on groceries and access fresh and healthy food at a lower cost. Besides that, urban farming can help increase food security by providing a reliable source of fresh produce in areas with limited access to healthy food.

Overall, urban farming has the potential to contribute to the affordability and accessibility of nutritious food in urban areas, especially in low-income communities such as PPR housing. However, the systems in urban farming use high-demand water, which can deplete the city's water supply (Lupia and Pulighe, 2015). Additionally, there is concern about how urban farming systems will be constructed into the existing residences without damaging the existing structures (Kulatunge et al., 2022).

LITERATURE REVIEW

People's Housing Project (PPR)

The People's Housing Project, also known as Program Perumahan Rakyat (PPR) in Malaysia, is a government initiative that aims to provide affordable housing for low-income families. The PPR was launched in 1982 and has since helped alleviate the affordable housing shortage for Malaysians, particularly those living in urban areas. The PPR offers a range of housing options, such as high-rise apartments, terraced houses, and low-cost flats at prices that are subsidised by the government, making it more accessible to low-income families. Basic facilities such as shops, clinics, playgrounds, and mosques are considered to ensure that the residents have access to all necessary amenities. The option to rent a property also allows more flexibility to the B40 income earners who cannot purchase a property (Properly, 2020). According to the 2019 Household Income and Basic Amenities Survey Report by the Department of Statistics Malaysia (DOSM, 2020), the income threshold for households under the B40 category in Malaysia is RM 4,849 per month. The PPR is designed to provide temporary living accommodations for those who plan on purchasing their own home in the future. The government's goal for these housing projects is to provide a temporary living space for its citizens to save money before purchasing their own homes.

PPR Design Criteria

The PPR building designs in Kuala Lumpur (KL) are the same, but the overall design of the complex varies between PPRs. Typically, PPRs are between 18 and 22 storeys and vary in the number of blocks: from two to six blocks per complex, each providing 284 to 316 units. They also cover different sizes of land areas and have different density levels. Because of their consistent and conventional high-rise design, PPRs in KL are generally distinct from other nearby housing complexes. The KL PPRs adopt a symmetrical design with the units in front of each other. Studies have revealed that through observation across case studies, the amenities provided in housing complexes are not strictly homogenous despite being under the PPR umbrella (Institute Khazanah, 2023). It was observed that some facilities were 'added on' long after the residential buildings were built in response to demand from the residents. Nevertheless, in some cases, residents can still find amenities within the neighbourhood when those facilities are not provided within the PPR complex.

PPR Residential Satisfaction

PPR residents' level of satisfaction measures whether the PPRs are serving the users' needs. Residents' perceptions may differ amongst PPRs because of the varying density levels and amenities available at the complex. Despite having a standardised uniform design, the PPRs had several different densities, which may impact the housing experiences of its residents. The amenities available to inhabitants varied according to PPR, with some enjoying a broader choice of amenities than others. This implies that the respondents' living setting, and hence their total housing experience, was heavily influenced by the PPR in which they resided.

In general, the residents are satisfied with current PPR schemes. However, there are flaws in the current standard plan for low-cost, high-rise flats. Quality elements of the indoor environment, outdoor environment, residential facilities and building management influence the residents' quality of life. Good internal and external planning of the low-cost housing scheme improve residential facilities. A dependable building management team will improve the quality of life in low-cost apartments even more.

Urban Farming

Urban farming is an emerging idea that is gaining popularity in cities worldwide. As more people become interested in locally produced food and sustainable agriculture practices, urban farming provides a unique alternative by allowing individuals and groups to grow their own food within urban environments (Adhikari and Bhattarai, 2023). However, to fully realise the potential benefits of urban farming and successfully integrate it into our cities, we must look at several variables, including land availability, environmental impact, and community involvement (Llieva et al., 2022). Despite the challenges of urbanisation, urban farming can benefit farmers and farming communities near urban centres by integrating small farms into disused spaces within the city, promoting cross-generational and cultural integration, job creation, community development, and economic savings on food (Mohammadi and Maryam, 2019).

Types of Urban Farming

Urban farming exists in several types. Urban farming is distinguished by its multi-functionality. That statement is because urban farming has also been claimed to contribute to water efficiency, energy conservation, air pollution reduction, community solidarity, improving the economic well-being and revitalising low-income communities (Angotti, 2015). However, urban farming has mostly been practised by the low-income group but not the very poorest (Zezza and Tasciotti, 2010).

Despite many of the benefits of urban farming, it also has drawbacks. Urban farmers have several challenges, including limited area, access to water and sunlight, and zoning limitations (Anwasha et al., 2020). However, urban farmers are uncovering strategies to overcome these problems via ingenuity and creativity. (Likitswat, 2021)

Urban Community Farming Policies in Malaysia

In Malaysia, urban community farming is governed by a variety of policies and regulations at both the federal and state levels. The federal government has created a National Agriculture Policy (NAP) to strengthen the agricultural sector's contribution to the national economy, promote sustainable agriculture practices, and improve food security (FAMA, 2023). Local governments regulate and encourage urban agricultural operations within their territories at the state level.

According to Husain in 2023, before COVID-19, most of the Malaysian urban population had not joined a community garden before. However, urban farming has become more popular due to increasing stakeholder support. The critical issue that always being discussed by the Municipal government is how much space is to dedicate to urban farming, what are the systems approach and how much cost would be needed (Rozhan and Rasmuna, 2021). The government must look at legal matters supporting urban farming to ensure effective urban landscape management.

Community Perception of Urban Farming

The community's perception of urban farming may differ based on the environment, region, and culture. Much research has shown that the Malaysian community has favourable perceptions of urban farming. Azman et al. (2013) found that the community viewed urban farming positively as promoting food security, enhancing community development, and providing income-generating opportunities for urban residents. Their findings suggested that the community saw urban farming as a method to minimise their dependency on imported food, enhance access to fresh, healthy food, and improve their quality of life. The community recognised the social benefits of urban farming, such as collaborating with neighbours towards a common objective and fostering social cohesion.

Similarly, another study on negative perceptions of urban farming by (Jac Smit, Joe Nasr and Annu Ratta, 2001) states that the main issues that may arise from urban farming are caused by its proximity to heavily populated areas that share the same air, water, and soil.

In conclusion, this section presents an overview of Malaysia's existing urban farming framework and investigates its feasibility within low-cost housing communities. It emphasises the inconsistency of resident happiness in PPR housing, addressing topics such as crowding,

maintenance challenges, and security. Urban farming has been suggested as a viable solution to food insecurity, with benefits such as enhanced food security, cost savings, and social cohesion. While Malaysians have a positive view towards urban farming, obstacles such as a lack of expertise, space, and resources continue. Incorporating urban farming within public housing projects such as PPR can help to solve these issues while also improving food security and delivering economic and social advantages. However, additional efforts are required to overcome constraints and improve resident satisfaction in PPR housing.

METHOD

This research flowchart has presented two qualitative data collection methods: interviews and case studies, to explore the critical role of urban farming in low-cost housing towards the sustainable well-being of urban dwellers in Malaysia, specifically focusing on People's Housing Projects (PPR) in Selangor. The research flowchart of this study is illustrated below in Figure 1.1.

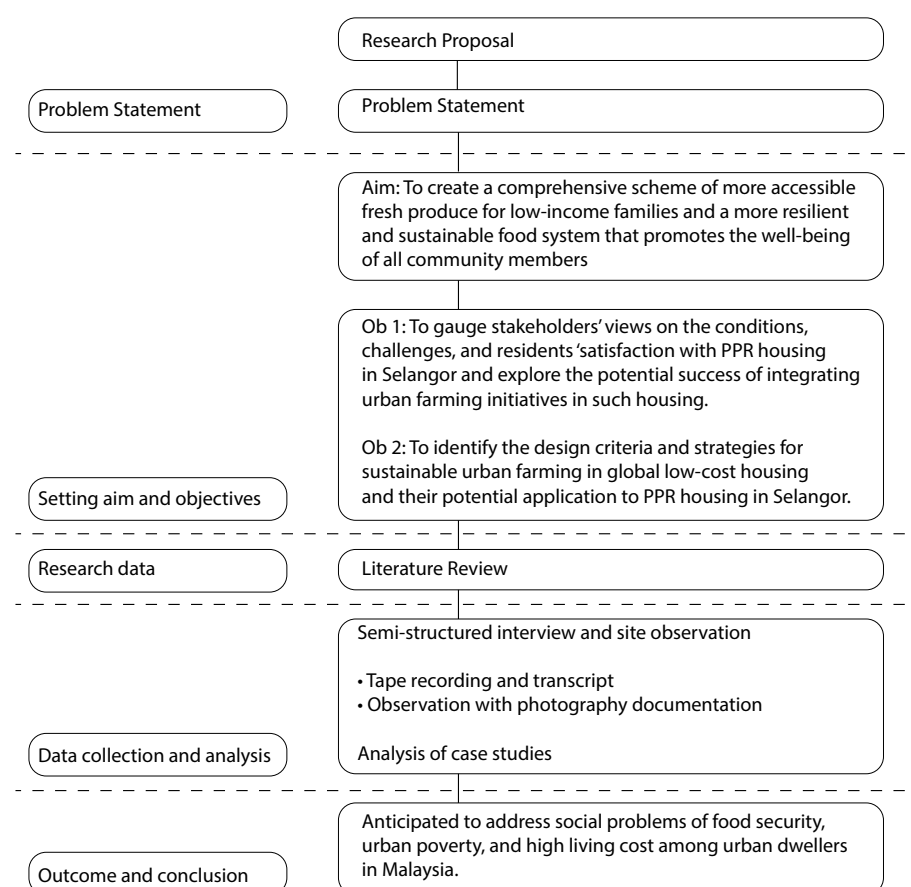


Figure 1.1: Flowchart of this study is illustrated above.

The research approach employed in this study, consisting of interviews and case studies, enabled the gathering of in-depth insights into the conditions, challenges, and potential success of integrating urban farming initiatives in PPR housing. The findings from this research provide a foundation for further exploration of sustainable design criteria and strategies for urban farming in low-cost housing. Ultimately, this research aims to contribute to the sustainable well-being of urban dwellers in Malaysia and practices that enhance the integration of urban farming in low-cost housing projects like PPR in Selangor. Ultimately, Figure 1.2 below illustrates the research proposal employed in this study.

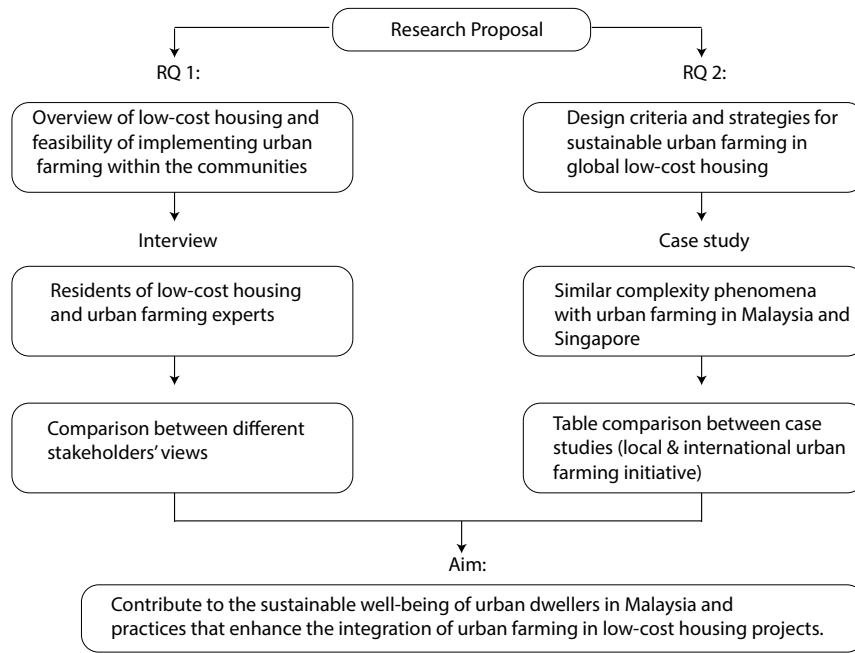


Figure 1.2: The research approach employed in this study is illustrated above.

RESULT AND DISCUSSION

Interview Result

Residence satisfaction in low-cost housing varies due to factors experienced during their long-term stay. At the PPR Seri Semarak, residents face a critical parking problem caused by nearby condominium construction, leading to parking loss and frequent summonses. In contrast, residents express varying levels of satisfaction, with some highlighting comfort and the availability of spaces for children, while others note the need for maintenance and a desire for larger housing. In Flat Seri Perlis 2, anxiety arises from undisclosed redevelopment plans, particularly for older residents facing challenges moving, obtaining loans, or affording new accommodations. Maintenance issues, including rundown buildings and water leakage, further affect residents' living conditions and satisfaction.

The inactive community involvement in urban farming at PPR Seri Semarak has resulted in missed opportunities for residents to benefit from its potential advantages. The underutilization of Laman Agro Seri Semarak has led to a loss of potential food production. Some residents cited financial constraints, lack of awareness, insufficient space, and other commitments as barriers to participation.

In contrast, active community involvement in urban farming at Flat Seri Perlis 2 plays a crucial role in reaping the benefits of such initiatives. Residents who actively engage in urban farming report positive outcomes such as access to fresh produce, reduced household expenses, a sense of pride in growing their own food, and being influenced by the success of community farming. Despite some individual constraints, the community's awareness of the community farm and its positive reputation contribute to their active participation in urban farming.

Urban Farm Tech primarily focuses on corporate projects but assists in operating, maintaining, and harvesting. However, the company provides initial training for community projects while the community maintains the farm.

Perceptions within the PPR Seri Semarak community regarding urban farming impact their engagement and participation in related initiatives. Some individuals view farming as labour-intensive and time-consuming, while others believe that limited space hinders its productivity or consider it a specialized field requiring expert knowledge. Conversely, positive perceptions among

the Flat Seri Perlis 2 community drive active involvement in urban farming, with individuals valuing direct access to nutritious produce, reduced reliance on store-bought options, and the sense of community pride and connection it fosters.

Urban Farm Tech's self-harvesting events align with community perceptions by raising awareness and facilitating engagement, with participants asking questions and seeking a deeper understanding of the urban farming system.

Case Studies Result

Based on several criteria for implementing urban farming initiatives in low-cost housing, the summary of the design evaluation and analysis is shown in Table 1.0 below.

Table 1.0: Summary of the design evaluation and analysis of case studies

	PPR Seri Semarak	Flat Seri Perlis 2	Urban Farm Tech	Rooftops of HDB multi-storey car parks
Typology	Housing	Housing	Commercial	Commercial
Type of urban farming system involved	• Hydroponic infrastructure • Traditional soil farming	• Hydroponic infrastructure • Traditional soil farming	• Hydroponic system • Solar system • Rainwater harvest	Aqua-organic system
Community involvement	Farming and harvest	Farming, harvest, and trades	Only during harvest and purchase	Only during purchase
Community's perception of urban farming	Positive	Positive	Positive	Positive

DICUSSION

Based on research question 1, the findings from the interviewees' responses highlight the varying conditions of PPR housing in Selangor, with common challenges including parking problems, redevelopment plans, and maintenance issues. Resident satisfaction also varies, but some residents report positive outcomes from urban farming initiatives, such as improved access to fresh produce, reduced household expenses, and a sense of pride in growing their own food.

The potential success of integrating urban farming initiatives into PPR housing depends on factors such as community involvement, space availability, and government support. Challenges identified include a lack of community involvement, limited space within PPR housing units, and insufficient government support for urban farming initiatives in terms of land, water, and training.

On the other hand, urban farming in PPR housing has shown successes in various aspects. It has provided increased access to fresh produce, enhancing residents' health and nutrition. Additionally, urban farming has helped residents reduce their household expenses by cultivating their own food. Moreover, it has fostered an increased sense of community among residents as they work together in the process of growing food.

Overall, the potential for successful integration of urban farming initiatives into PPR housing depends on multiple factors. While challenges exist, there is evidence that urban farming can positively impact resident satisfaction and enhance the overall quality of life within PPR housing communities. By addressing challenges and leveraging the identified successes, urban farming can contribute to the well-being and satisfaction of residents in PPR housing.

Based on research question 2, the case studies have identified key design criteria and strategies for sustainable urban farming in global low-cost housing. These include the use of space-efficient farming methods such as hydroponics, aquaponics, vertical farming, and aqua-organic systems to maximize crop production in small spaces like rooftops, balconies, and courtyards. Sustainable water management practices like rainwater harvesting, greywater recycling, and drip irrigation can help conserve water and minimize the environmental impact. The use of local and organic materials in urban farming reduces environmental harm and ensures the production of healthy, nutritious food. Additionally, community involvement plays a vital role by fostering a sense of ownership, responsibility, and providing educational opportunities.

The potential application of these design criteria and strategies in PPR housing in Selangor is significant, particularly due to the densely populated areas and limited access to green space typically associated with PPR housing. Implementing urban farming initiatives can provide residents with increased access to fresh produce, reduce reliance on store-bought food, and facilitate community connections. By incorporating these design criteria and strategies, PPR housing communities can enhance food security, promote sustainability, and foster a sense of community and well-being among residents.

CONCLUSION

This study addressed the main research aims to formulate a sustainable urban farming design framework for PPR housing to address food insecurity and improve residents' social well-being among urban dwellers in Selangor, Malaysia. Specifically, the study was conducted to achieve two research objectives:

RO1: To gauge stakeholders' views on the conditions, challenges, and residents' satisfaction with PPR housing in Selangor and explore the potential success of integrating urban farming initiatives in such housing.

RO2: To identify the design criteria and strategies for sustainable urban farming in global low-cost housing and their potential application to PPR housing in Selangor.

In order to achieve RO1, a semi-structured interview among building stakeholders (qualitative data collection) in Kuala Lumpur were conducted. In general, the findings from the interviewees' responses shed light on the conditions, challenges, and residents' satisfaction with PPR housing in Selangor, as well as the potential success of integrating urban farming initiatives in such housing. Integrating urban farming initiatives in PPR housing in Selangor has the potential to address challenges, enhance resident satisfaction, and improve the quality of life. However, the success of such initiatives hinges on factors such as community involvement, available space, and government support. By addressing these factors and leveraging the benefits of urban farming, PPR housing can become a more sustainable and satisfying living environment for its residents.

To achieve RO2, an analysis of case studies was carried out to understand the following: (1) Typology, (2) Type of urban farming system involved, (3) Community involvement and (4) Community's perception of urban farming. The finding highlighted the design criteria and strategies for sustainable urban farming in global low-cost housing have yielded valuable insights. The identified design criteria and strategies include the use of space-efficient farming methods, sustainable water management practices, utilization of local and organic materials, and community involvement. The identified design criteria and strategies for sustainable urban farming can be effectively applied to PPR housing in Selangor. By integrating these practices, PPR housing communities can benefit from increased food security, improved nutrition, reduced environmental impact, and enhanced community well-being.

Overall, this study highlights the significant potential of integrating urban farming initiatives into PPR housing, providing a pathway towards sustainable and satisfying living environments for residents. By considering the identified design criteria and strategies, stakeholders can promote sustainable urban farming practices and enhance the overall quality of life for low-income urban dwellers in Selangor and similar contexts.

ACKNOWLEDGEMENT

It would not have been possible to compose this dissertation without the assistance and support of the thoughtful individuals around me, only a few of whom should be mentioned here.

Foremost, I would like to express my deep appreciation to my principal supervisor, Assoc. Prof. Dr. Zalina Shari at University Putra Malaysia, for her assistance and compassion in imparting knowledge and expertise in finishing the dissertation paper.

I would also like to thank the main coordinator of Architectural Dissertation, Assoc. Prof. Dr. Mohd Zairul Bin Mohd Noor, for his advice and guidance in writing the dissertation paper.

Ultimately, I am grateful to all my family and friends who have never stopped encouraging and supporting me over the years. I cannot think of any meaningful words to express the appreciation and generosity I have gotten from everyone.

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EXPLORING THE DESIGN FRAMEWORK FOR FOOD WASTE RECYCLING AWARENESS IN CHOW KIT WET MARKET

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ABSTRACT

In Malaysia, the overall waste composition is dominated by food waste due to excessively convenient food accessibility, urbanisation and progressive prosperity. Due to mismanagement, food waste problems are significant in most wet markets in Kuala Lumpur. Despite the significant waste stream and availability of food waste recycling centres in urban areas, there is a relatively low rate of recycling organic waste compared with other major waste categories. Therefore, this research aims to explore the design framework for integrated recycling in the existing wet market to improve public outreach of food waste recycling. Chow Kit Market was explored from a human-centric perspective to analyse the existing food waste management and through observation of market workflow and spatial design. This research aims to investigate the challenges of current food waste recycling practices in an existing wet market and propose appropriate design strategies to optimise food waste recycling for improved public outreach. It supports the government's commitment to achieving Sustainable Development Goal (SDG) 12 of responsible consumption and production and SDG 8 by promoting sustained economic growth through improved resource efficiency and a new circular economy. This paper raises awareness for improving the implementation of food waste recycling strategies in urban wet markets. It is hoped that the sustainability of the food waste system for innovative recycling strategies provided in this paper can be further explored in other food retail operations in Malaysia.

Keywords: wet market; food waste; recycling; public outreach; human-centric design

INTRODUCTION

Food waste is a significant component of the global food system challenges. All food materials produced for human consumption that are left uneaten throughout the retail and consumer level are referred to as food waste (FW). According to the Food and Agriculture Organization of the United Nations (FAO) statistics, approximately one-third of global food production is wasted yearly. In Malaysia, FW represents the major waste stream of the overall waste composition (Fauziah and Agamuthu, 2012; Mohd Yatim et al., 2019). FW occupied 44.5% of the overall waste composition, the highest composition over other major waste categories such as plastic (13.2%), paper (8.5%) and glass (3.3%) (Lie, 2020). The management of FW continues to be a major challenge in urban areas in developing countries. The United Nations (UN) estimated that more than half of Southeast Asia's population resides in cities. The changes in lifestyle and consumption patterns linked to rapid economic development and population growth in urban has also contributed to an increase in waste generation (Lim et al., 2016; Papargyropoulou, Lozano, et al., 2014; Xiao and Siu, 2018).

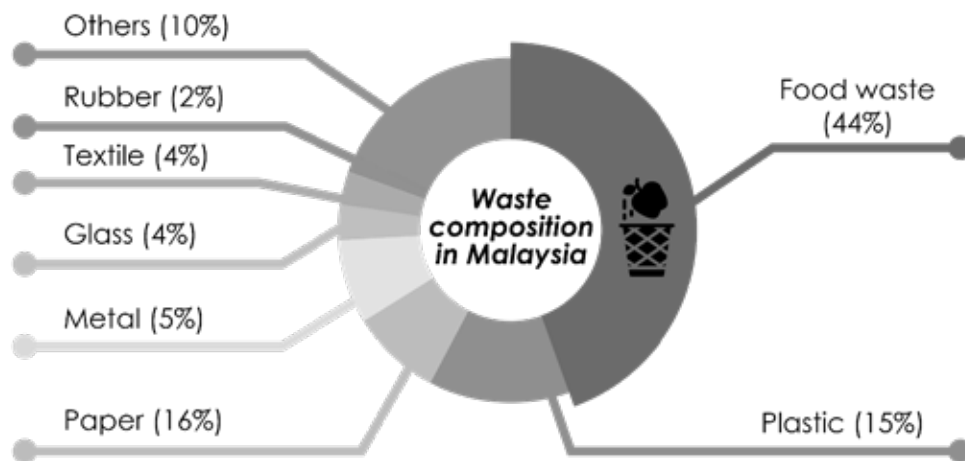


Figure.1 Pie chart of the overall waste composition in Malaysia shows that food waste represents the largest portion of the total solid waste produced by Malaysians.

Source: Lie (2020)

Wet markets, as a traditional form of food retail, are one of the essential parts of our local food culture, providing diverse fresh produce at affordable and bargainable prices. Until today, wet markets continue to thrive in Malaysia because of the freshness of their food. Most consumers consider freshness a valued feature as it is also associated with food quality and safety. Therefore, market vendors tend to fulfil consumers' demands by trimming off or discarding undesired parts as FW, even though they may still be edible or have not lost quality. Unsold and unfresh food is discarded at the end of the day due to its reduced physical appearance. According to Jereme et al. (2016), markets are the second largest FW generator in the nation, amounting to more than a quarter of FW generation per day during the fresh food sorting and processing workflow. The food scraps will either be hosing away on the damp floors or end up in landfills.

Wet markets in Kuala Lumpur nowadays are degenerating into sorry sights of filth. FW and murky puddles have become synonymous with most wet markets in the city. Based on an observation conducted by the author in 2022, the operational conditions in Chow Kit wet market reveal improper planning in space and circulation for FWm. Owing to the unsystematic waste management, vendors tend to overlook hygienic practices when sorting and processing their fresh food. Littering and hosing food scraps with water can be observed mainly in the meat market section. Meat parts, fish scales and fins are small scraps from the butchered meat, which might be challenging to handle and dispose of in waste bins. Vendors usually hose counters and chopping boards to keep them clean, contributing to the slippery floors and drains stained with heaps of FW. As a result, drains have turned into "rat hideouts". According to a newspaper report, the main factors contributing to the abundant presence of rats in markets are the water, FW and shelters, such as holes in the drain (Five KL markets, 2015). With the high reproduction rate of rats, most wet markets face rat infestation and the risk of being exposed to potential food safety hazards (Ali, 2022). During the COVID-19 pandemic, wet markets were under an intense situation with speculation that Wuhan wet market in China was ground-zero for the coronavirus outbreak (Australian Centre for International Agricultural Research, 2020). Indeed, there are worries about diseases that can spill over from animals into humans, arguing that wet markets are unsafe.

With the mismanagement of FW in wet markets becoming significant, Kuala Lumpur City Hall has ensured that the SWMC collects waste daily from urban wet markets. However, the market users are still unaware of their daily behaviour on the environmental impacts and possess very low intention in FWm. The Kuala Lumpur Vegetable Wholesalers Association's president, Wong Keng Fatt, credits the unpleasant market environment to a lack of good hygiene practices and food-related routines among market vendors and buyers despite routine cleaning done by SWMC (Jun, 2020). Given the circumstances, it is not surprising that nobody will eventually want to visit wet markets anymore. Urban wet markets as the cultural identity could soon vanish from Malaysian food culture.

Currently, the FWm in wet markets is dominated by landfilling as the waste management system was implemented solely to remove wastes from and near living spaces. However, this linear cycle, simply removing wastes, became unsustainable. Due to leachate and methane gas emissions, FW dumps became major sources of regional environmental pollution. Transporting FW from the urban wet market to landfills on the outskirts contributes to extra carbon emissions (Fauziah and Agamuthu, 2012). FAO (2014) reports show that FW accounts for 4.4G tons of CO₂ and 8% of GHGs emissions globally. Despite its recyclable value, FW remains unutilised sustainably as a resource to enhance future production. Even with the increased interest in solid waste management (SWM), FW remains the stream that has not obtained sufficient attention. Regarding food waste management (FWm), the treatment of FW in Malaysia is still minimal due to a lack of sound innovation and strategies. In other developed countries, reducing FW can be measured using the 3R methods – reducing, reusing and recycling. The rate of food waste reuse and recycling (FWr) in Malaysia is relatively low. The current rate of FWr is estimated to be only 5% in comparison with other waste categories, such as paper (60%) and plastic (15%) (Lim et al., 2016).

This situation creates a crucial need for improvement in FWm in urban wet markets. There have been many studies regarding the treatment of solid waste. However, FW, as a special category of solid waste, has high moisture, salinity, organic and grease content, which requires different treatment methods from common solid waste (Anqi et al., 2017). The more prominent FW treatments that have been discussed in previous studies are composting, anaerobic digestion and animal feeding, which is also the more sustainable options to be implemented in Malaysia, replacing incineration and landfill (Anqi et al., 2017; Lim et al., 2016; Mohd Yatim et al., 2019). FW is also called organic waste, in which over 90% is biodegradable. Composting organic waste is popular due to simple operation management and high economic efficiency. However, the rate of recycling and reusing FW is still shallow compared to other major waste categories (Lim et al., 2016). Unlike paper and plastic, no systematic disposal methods and strategies for FW are available. Based on an initial survey conducted by the author in Chow Kit Market, the result reveals that none of the vendors practices FWr, and only a few buyers have requested FW for their composting purpose. The awareness of FWr among Malaysians is still poor. Despite many researchers examining the study directions of operations management to reduce FW, a comprehensive and human-based analysis of planning approaches regarding FW awareness is missing. In general, users' knowledge of the environmental effects of FW could influence their FWm intention. Awareness should apply to vendors and buyers to encourage a proactive FW reduction and separation practice in wet markets and at the household level.

This paper aims to propose the design framework for integrated recycling in Chow Kit Market to improve public outreach of food waste recycling. The objectives of this study are as follows:

- *RQ 1.* To investigate the challenges of food waste recycling practice in the Chow Kit Wet Market.
- *RQ 2.* To identify the design strategies for integrating food waste recycling in Chow Kit Wet Market for improved public outreach.

LITERATURE REVIEW

Food Waste Recycling

The phrases “food surplus”, “food loss”, and “food waste” are often used interchangeably, but their definitions and scope differ. According to Irani et al. (2018), FW is defined as food materials produced for human consumption left uneaten at the retail and consumer levels. Food loss refers to decreased food quantity or quality, making it unfit for human consumption throughout the harvest and distribution levels. In contrast, food surplus is food supply beyond our demand for it. Therefore, FW is more appropriate to describe the by-product generated at the wet market operation stage through fresh food processing. Market vendors normally pre-process fresh produce to fulfil consumer demands for freshness. For instance, trimming off dried stalks and leaves from vegetables, peeling off fruits skin and husks, discarding undesired or inedible meat parts and so on. Unsold and unfresh food is discarded at the end of the day due to its reduced physical appearance. Irani et al. (2018) further argued that this wasted food may still fit human

consumption or can potentially enhance resource utilisation.

A waste hierarchy was introduced and adopted worldwide as the principal waste management framework as early as the 1970s. The waste hierarchy provided a theoretical foundation for the Food Waste Hierarchy proposed by Papargyropoulou et al. (2014). The framework aims to guide establishing the most appropriate options for minimising and managing FW throughout the food supply chain. The priority is to prevent an oversupply of food beyond human needs so that the undesirable food surplus can be avoided. Redistributing unconsumed food surplus to people affected by food poverty is then proposed as the second favourable option. Then recycling FW into animal feed and compost is a third option of the resolution framework. Research by Cecchini (2017) also suggested the possibility of FWr in producing new bioplastic materials. According to the researcher, various vegetable, animal and microbial matters from the FW could be a great alternative to non-renewable synthetic polymers. Finally, Papargyropoulou et al. (2014) proposed energy recovery followed by landfill disposal as the least favourable option for managing the remaining fraction of unavoidable FW. This is supported by Anqi et al. (2017), that the anaerobic fermentation technique applied for energy recovery requires high cost and strict startup conditions, while landfilling demands a large land area and comes with a significant amount of greenhouse gas emissions. Therefore, based on the review, it is recommended that an appropriate option for the FWm system in a wet market setting can be determined through the Food Waste Hierarchy according to the properties of FW generated.

Considering the environmental, economic and social benefits of FWr, industrial ecology concepts such as “Cradle to Cradle” and “Circular economy” has become the leading principles for addressing sustainable waste management (SWM). An announcement by the Housing and Local Government (KPKT) Minister Datuk Seri Reezal Merican in a cabinet meeting in 2022 stated that a specific law to support sustainable FWm would be introduced in Malaysia soon. According to him, the efforts will focus on accelerating the transition from the concept of SWM, including FW, in a linear economy to a cyclical economy. This is aligned with research by Anqi et al. (2017), who suggested that FW can be a valuable resource when managed reasonably and effectively while reducing its environmental impacts. Mirabella et al. (2014) also discussed the great potential of waste produced by the food industry to be reused in other production systems. In addition to a loss of valuable materials, FW also possesses serious management problems from economic and environmental points of view. Therefore, the recycling of market FW could be an opportunity to promote greater economic sustainability. As wasted food in the wet market indicates food lost from its intended selling purpose, this could be a huge loss of investment cost and profit from market vendors. Instead of disposing to landfill, transforming FW into value-added products can help market vendors cover part of the profit loss from wasted food. In other words, by-products or waste from the market industry could sustainably become a resource for another industry, at the same time, spur local recycling industries that boost economic and job creation because of technological upgrading and innovation needs.

FW generated by wet markets is derived from different stages of food processing. They are often categorised as wet or dry waste. The wet wastes are produced by cutting the edible meat portion and removing hides in the meat market section. In contrast, the vegetables, fruits, and dry food market sections produced dry waste while trimming and disposing of unwanted parts. Therefore, the segregation of wet and dry wastes is the key to an effective FWm and to minimising the growth of bacteria (Al-Gheethi et al., 2021). According to Al-Gheethi et al. (2021), FWm technologies have developed greatly from simple processes to more efficient ones that can be classified into four categories: direct usage, biological processes, and physical and thermo-chemical processes. Currently, the reuse of edible surplus food, anaerobic digestion and composting are widespread in Malaysia because of the affordable operating cost and market demand.

By implementing a circular business model, manufacturing companies can gain stronger value chain relationships and yield long-tail revenues. In an article by Wang (2020), bakery companies like Renewal Mill Co. produce high-fibre gluten-free powder through sustainable solutions to FW. The company upcycles pulp by-products from soymilk processing into baking flour equivalent to whole wheat flour, which can be used to make cookies and baked goods. Research by Cecchini

(2017) also looked into manufacturing biopolymers products from FW instead of specially grown crops. According to him, various organic wastes, such as fruit peels, eggs and seafood shells, are potentially helpful in recovering and reusing valuable carbohydrates and cellulose fibres. Starches, cellulose, pectin, chitin, lactic acid, collagen, blood proteins, and gelatin form the basis of bioplastics and can be extracted directly from these organic wastes or by mechanical or chemical processes. In addition, Fairus et al. (2022) also suggested a biocomposite material created through a natural biological process suitable for the manufacturing of biofoam and packaging materials. The foam-like mycelium composite is a composite material produced by combining the matrix and natural fibre results from the filamentous fungal growth on agricultural wastes. According to them, this biocomposite material could be a vital alternative to non-renewable packaging materials. Table 2.1 summarises some techniques and products that could be produced from wet market FW.

Challenges of Food Waste Recycling Practices

It is well acknowledged that public acceptance is the main driving force in determining the success factor of FWr initiatives. Substantial studies have looked into challenges affecting public acceptance of waste recycling. Siu and Xiao (2016) pointed out inconvenience in the waste programme design as the main barrier to community participation. According to their research in Hong Kong, the existing planning is generally based on policymakers and experts assuming they share a common understanding of convenience rather than focusing on the users' point of view. Therefore, the current public recycling facilities failed to meet individual preferences due to a lack of consideration of convenience in the planning and implementation. This standpoint was further expanded by Vassanadumrongdee and Kittipongvises (2018), who suggested that inconvenience can be categorised into two characteristics. First, it can be associated with limited storage space, additional time requirements, or perceived risks associated with the practice. Second, sending recyclables to the waste collection facility requires excessive energy. Meanwhile, the present study by Jereme et al. (2016) identifies lacking information and unconsciousness about the environment as the reason for food wastage. This is because an individual without environmental consciousness could not relate food wastage to FW generation and the environmental impacts on future generations. A study by Ramli et al. (2020) also proves that knowledge is the most prevalent factor in public acceptance of FWr.

In Malaysia, the findings revealed that the government's current initiative in encouraging good habits of FW disposal failed to address a more comprehensive FWm framework. These initiatives include the NSPFWMM, although the planning relaunched in 2020 is still underway in the planning and development phases. The NSPFWMM was already announced in 2010 with almost similar ideation. This is aligned with research by Lim et al. (2016), stating that most countries face incomplete legislation and policy obstacles, inadequate management, weak enforcement and a lack of allocation budget in recycling planning. The government's attention generally draws only to high-value recyclables such as paper, plastic and aluminium. Only one out of 532 pages of the Twelfth Malaysia Plan mentions FW. Thailand's government seems to focus more on waste-to-energy while less budget is given to expedite recycling initiatives (Vassanadumrongdee and Kittipongvises, 2018). With a general lack of political will to invest, Thailand's recycling programmes mainly rely on market mechanisms operated by the informal sector. However, market incentives so far draw only high-value recyclables though low-value recyclables are discarded with other wastes. Vassanadumrongdee and Kittipongvises (2018) also pointed out another barrier related to recycling infrastructures is certain mistrust due to low, transparent recycling processes due to unclear and ineffective policy measures that drawback public perception of the recycling scheme. In Indonesia, Soma (2017) further discussed urbanisation factors as rapid urbanisation further disconnects the urban population from sustainable management. This is partly due to the lack of programmes to support the separate management of FW. Therefore, in planning the FWr programme, a comprehensive management system yet transparent process should be considered.

Public Outreach

Public outreach is an effort to bring awareness about the FW issue to market communities. Adopting meaning from the SDG Accountability Handbook (Cardinal, 2018), awareness-raising is a process that seeks to inform and educate people about the FW issue to influence their attitudes, behaviours and beliefs towards the achievement of encouraging FWr practice. Comber and Thieme (2013)

define awareness-raising as a key stage in behaviour change. The Theory of Perceived Behaviour (TPB) is a psychological theory adopted in some prior literature to aid the understanding of the public's recycling intention and behaviour. TPB model as the theoretical framework for examining the intentional disposal behaviour is adapted in their study schemes regarding FW reduction and recycling (Comber and Thieme, 2013; Abadi et al., 2021; Cheng, 2020; Karim Ghani et al., 2013; Vassanadumrongdee and Kittipongvises, 2018; Zainal and Hassan, 2019 and Seng et al., 2021).

Attitude in the TPB model depicts a person's favourable or unfavourable attitude towards a specific behaviour. For recycling, belief and knowledge towards ecological sustainability, as well as perceptions of the responsibility to act ecologically friendly, is linked to the intentions to carry out environmentally friendly behaviour. Abadi et al. (2021) indicated that attitude towards FWm positively affects behavioural intention. They suggested that the present studies provide evidence that a person with a positive attitude towards FWm is more likely to be aware of environmental problems and, subsequently, consider such concerns substantial. In the case of encouraging FWr practice in the wet market, the public can be educated on the method used in the recycling market's FW and the processes involved from collection to recycling. Therefore, a positive attitude towards FWr shapes their recycling intention and behaviour.

Behavioural change also occurs through normative social influence or pressure, where a person is encouraged by the desire to obtain social approval and avoid rejection by others, as justified by Comber and Thieme (2013). In other words, social norms can be explained as the beliefs about the normative expectations of others and the motivation to comply with these expectations. According to Abadi et al. (2021), people tend to get influenced by norms as they interact with those around them in social circumstances. Alternatively, a recycling programme or cluster facilities may be implemented to foster group participation among the market communities. This can be extended through the power of social influence in motivating the public's performance of FWr in the wet market.

Perceived Behavioral Control (PBC) is a person's sense of self-efficacy as it relates to implementing a particular behaviour. According to Karim Ghani et al. (2013), it implicates the belief about the presence of additional factors, such as perceived habit, perceived inconvenience and perceived effort, that may facilitate performance or engagement of the behaviour. The suggestion in terms of recycling has been pointed out by Comber and Thieme (2013) that there is a high potential to perform recycling behaviour when the possibility of perceived inconvenience is low. A similar perception was supported by Seng et al. (2021) when PBC was adopted in their research to assess the convenience of households to manage FW. The results reveal a higher intention to practice FWm among households when they perceived managing FW as easy practice. Thus, improving perceived convenience during the planning of the wet market is of utmost importance for engaging public participation in the FWr. In a nutshell, the more favourable the attitude and subjective norm, and the greater the perceived control, the stronger the intention to perform a behaviour. Addressing habitual FWr behaviours, motivating people to move beyond the most manageable behaviour, and evaluating the appropriate FWm poses a significant design challenge.

Design Strategies

It was indicated that knowledge was one of the predictors of recycling behaviour. Research on encouraging recycling conducted by Amanda in 2016 suggested the need to address improved awareness and increased access to designing a recycling system. Ganglbauer et al. (2012) also recommended making FW topics visible through technology could be an enabler for awareness. Doing so makes it possible to reflect wasteful behaviour to the users and draw their attention to the FW issue. Klunbut et al. (2017) proposed an options development of waste management in their research focusing on waste generation, handling, separation and storage, and collection. The proposal was designed to lessen initial waste generation through source reduction, reuse and recycling to minimise the volume of material sent to landfills. This operation could be a model guiding future planning of the FWr system in wet markets. A comprehensive system serves to acknowledge the public understanding process of FWr. In addition, with an appropriate selection of recycled products based on the market setting, the entire system can function towards the circular economy concept.

Efficiency is the basis for a dedicated recycling facility dealing with waste disposal and collection. As suggested by Klunbut et al. (2017) in their research on market SWM in Thailand, the market, as the facilitator of the SWM system, should provide appropriate waste management equipment for the vendors. In addition, the idea of “Cluster” proposed by Amanda (2016) signified the idea of efficiently collecting recyclables and organic waste in the private realm. Businesses and residences grouped near the market can use the cluster’s design elements to share waste collection facilities. On top of that, the recycling facility can be further instilled with new functions such as a research laboratory, gallery, and workshops. The ideation should also encourage the non-participating public to be part of the community and encourage their participation in recycling behaviour. In other words, when designing recycling facilities, the main idea is to conceive this system as services and nodes to engage diverse audiences and empower willingness to participate in sustainable practice.

Substantial studies on recycling indicate that convenience is necessary for designing a recycling programme. Convenience is defined by Oxford English Dictionary (2014) as the ability to proceed with something without difficulty. According to Siu and Xiao (2016), the convenience categories can be further narrowed to two dimensions: time and energy. However, the busyness of working lives limits urbanites’ available time and energy. A lack of time and energy for excessive activities is a crucial point where intentions do not translate into behaviour. Therefore, increasing recycling accessibility in urban areas is crucial in determining the success factor of a recycling programme. One way is by providing a collection point or drop-off bins at optimal locations. An example of an underground vacuum waste management system was opened in the housing development in London in 2008. The waste collection system has the advantage of making more convenient access and efficient use of urban space for waste separation and collection. In comparison, the most fundamental constraint on the location of collection facilities is determined by the walking distance acceptable for the public to transport waste along the circulation path that the public used to pass by.

METHOD

A qualitative research approach was adopted in this study because it allows for a more in-depth understanding of the current practice of FWm, and identifies challenges and strategies to redesign Chow Kit wet market with FWr integration. The interview and observation methods were employed to address research question 1. To answer research question 2, a desk review of international and local case studies of existing FWr facilities was performed. The research methodology is depicted in Table 1 to investigate the study’s research questions.

Table.1 Research questions and Research methodology.

Research Question (RQ)	Data Sources
RQ1: What are the challenges of food waste recycling practices in the Chow Kit wet market?	In-depth interview and Observation
RQ2: What are the design strategies for integrating food waste recycling for improved public outreach?	Case studies analysis

In-depth interviews and field observations were conducted in Chow Kit wet market. It was revealed from the literature that wastes segregation is critical to an effective FWr. Therefore, the interview aims to identify the challenges of FW segregation practice in the market. Considering the need to propose design strategies for integrated FWr in the wet market, observation was performed to gain insight into current waste collection practices and determine how FW is created and disposed of. Information about the current waste management was obtained by interviewing market operators. Both interviews and observations were conducted by the researcher alone. To document the observations, notes and photos were taken with a phone during the tour. Stalls and the market’s floor map were created to gather information about the workspace. Moreover, the vendors were interviewed during observation to obtain additional qualitative data. Interview data were recorded using an audio recording. The data were presented by translating direct respondent quotes from the original colloquial language into English and recorded in Appendix A. Pseudonyms were used to name respondents. Following that, all data were analysed qualitatively.

Respondents were selected based on the target groups involved in FWr practices. These target groups include the user group, which is vendors from all three main market sections and buyers from two age groups and purpose of visiting, and the key person group include market management staff, sanitation workers and SWM company operating staff responsible for the waste management in the Chow Kit wet market. Another criterion was based on their willingness to participate in the conversation. Interviews with various stakeholders helped in gaining different insights into the practice. Face-to-face interviews were conducted with the vendors, buyers and sanitation workers in Chow Kit wet market. Interviews with market management staff and SWM company operating officer were conducted by email because this is an efficient way that allows responses to be made promptly. A semi-structured interview approach was adopted, giving the respondents flexibility to answer from the conversation. This allows the researcher to acquire more contextual and in-depth data by allowing two-way conversations with the respondents. An interview guide to provide a discussion structure was developed. The questions in the interview guide were identified through the review of related literature.

Case study research is an empirical inquiry that enables reflective learning from another project with similar attributes. This study conducted a comparative analysis of case studies from local and international food-related developments with integrated FWr facilities. The purpose is to further analyse the success strategies for FWr best practices. Four case studies (two international and two local) were selected for the study. They were selected based on the geographical location of Southeast Asia to ensure a similar composition of FW, source of FW generation, which limits to retail and consumption level, and type of the FWr operations from their source. Both international case studies were conducted through desk review using secondary data from publications, websites and official records. On the other hand, personal visits to local case studies were conducted to collect primary data.

RESULT AND DISCUSSION

Nine respondents participated in this research, including three vendors, five buyers and one sanitation worker in Chow Kit wet market. The three vendors operated stalls in Chow Kit wet market, while the sanitation worker was responsible for garbage collection and cleaning. The five buyers were regular customers in the market.

Limited space was one of the most significant challenges emphasised by the respondents. Due to the high density of living environments, most of the kitchen spaces were very small. Many respondents mentioned that their limited living space made it difficult to store FW at home. Time requirement was another challenge mentioned by respondents. Many respondents felt that they lacked time to separate the waste. Some did waste separation at home but did not have much time to deliver waste to the market or collection centre. Besides, the provision of equipment also affected the perception of convenience. Many respondents found it needless to do waste separation because no facilitated equipment was provided. Equipment such as separation bins was suggested by respondents.

Most of the buyer respondents had a high level of FW separation awareness. Most of them were doing waste separation practice at home. However, accessibility to proper waste management information was still insufficient in the market. During the site visit, a few recycling practices were found in Chow Kit wet market, indicating some recycling awareness. Most of the buyer respondents had the habitual behaviours of waste separation. They felt it was the usual practice, so they were more willing to manage FW properly. Social influence was also one of the determinants of the individual's decision to perform or not perform waste separation behaviour. Vendors generally indicated less interest in waste separation because of their perception of responsibility. They showed less concern about managing waste properly.

There was no enforcement in the current waste management scheme. The level of mistrust in policy was high due to non-transparent schemes and recycling pathways. Generally, respondents indicated less motivation and sustainable behaviour. Workforce consideration was highlighted by a few respondents, especially the Chow Kit wet market sanitation worker, who had put effort into the current waste management. Despite the large amount of daily waste generation, he mentioned

they could still properly handle the collection in the market area. However, introducing waste separation would increase burdensome duties to their sanitation staff members. Incentives were one of the stimuli that contributed to changing attitudes and behaviours. For example, reward-giving was highlighted by one of the respondents. Monetary rewards also drove the existing recycling practice by sanitation workers.

A comparative analysis of the FWr facilities is summarised in Table 2.

Table.2 Case studies Comparative Analysis Table.

<i>Case Study</i>				
<i>Type of Operation</i>				
<i>Country</i>				
<i>Operation</i>	<i>Case Study A Smart Waste Solution Lab</i>	<i>Case Study B W.I.S.E with Food</i>	<i>Case Study C Our Tampines Hub</i>	<i>Case Study D East Coast Lagoon Food Village</i>
<i>Selection Criteria</i>				
<i>Country</i>	Malaysia	Malaysia	Singapore	Singapore
<i>Typology</i>	Stand-alone recycling facility	In-house recycling facility	In-house recycling facility	In-house recycling facility
<i>Source of FW</i>	Wet and morning markets, food courts	F&B outlets in a shopping centre	Hawker stalls	Hawker stalls
<i>Enforcement</i>	No	Yes	Yes, with a tenancy agreement	No
<i>Collaborator</i>	Petaling Jaya City Council (MBPJ), CH Green Sdn. Bhd.	One Utama Shopping Centre, Microbs Sdn. Bhd.	National Environment Agency (NEA), The People's Association (PA)	National Environment Agency (NEA), National University of Singapore (NUS), National Parks Board (NParks)
<i>Overview</i>	The Lab promotes circular economy initiatives by recycling FW into value-added products to benefit society.	As a step towards being an environmental-friendly mall, the program commits "table to farm" approach in the shopping centre.	The FWm system serves as a platform to educate and nurture a culture to reduce FW in Singapore, contributing towards being a Zero Waste nation.	The FWm system aims to examine the feasibility of using anaerobic digestion as an on-site treatment solution.
<i>Operational practice</i>				
<i>Collection</i>	✓	✓	✓	✓
<i>Transportation</i>		N/A	N/A	N/A
<i>Incentivising tool</i>	✓	✓		
<i>Monitoring</i>		✓	✓	✓
<i>Recycling treatment</i>	✓	✓	✓	✓
<i>Recycling system</i>	Anaerobic digestion	Fermentation	Aerobic digestion	Anaerobic digestion
<i>By-product</i>	Liquid compost, bio-charcoal, biogas, detergent	Organic fertiliser	Organic fertiliser, liquid plant nutrients, non-potable water	Electricity, fertiliser
<i>Practice involved</i>	Bring-points, Urban farming	Waste bins return, Training program, Monitoring Smart Card & weighting	Training program, Tenancy agreement	Waste bin loading, sorter, shredder and feeder
<i>Space required for operation</i>	Waste sorting space, Composting facilities, Organic farm, Retail space, Education centre	Recycling room	Tray return station, Digester system space, FW collection conveyance system	Digester system space
<i>Approach to promote FWr</i>	Learning tour, Public visitation, Demonstration of vegetable cultivation, Sale of by-products	Guided tours, Training	Learning tour, Training	Reminding posters and wall stickers, Public engagement
<i>Equipment provided</i>		Collection bin, Monitoring card		Collection bin

Based on the data collected, the challenges of FW segregation practice were investigated through interviews and observation, while strategies for integrating food waste recycling for improved public outreach were identified from case studies. The findings could be classified into three final themes, as tabulated in the thematic analysis matrix in Table 3.

Table.3 *Thematic Analysis Matrix to conclude research questions.*

Research Question (RQ)	Deductive Code (DC)	Coding	Final Theme
RQ1. What are the challenges of food waste recycling practices in the Chow Kit wet market? RQ2. What are the design strategies for integrating food waste recycling for improved public outreach?	DC1: Convenience	1. Time 2. Space 3. Equipment	Increase accessibility for convenient access
	DC2: Attitude	1. Recycling awareness 2. Habitual behaviour 3. Perception of responsibility 4. Knowledge	Increase education to raise recycling awareness
	DC3: Policy	1. Enforcement 2. Effective process 3. Incentives	Increase efficiency to establish confident

By the end of the interviews, the researcher found that many of the vendors could not identify which other materials could be recycled besides paper and plastic. In practice, they threw a large amount of FW into the dumpster because they were unaware it could be recycled. Moreover, collecting all waste into one container became habitual among vendors. They considered waste separation to be the responsibility of sanitation workers and showed less intention to change their habitual waste disposal pattern when a question was asked to segregate FW. This indicates that unsustainable behaviour is not easy to change because people grow accustomed to their habitual behaviour. That is why all the buyer respondents mentioned that they were used to the waste separation practice at home.

Therefore, the educational programme should be considered in planning the FWR system. This was aligned with the suggestion by the other respondents that information accessibility and social influence could take place to achieve sustainable awareness. As proven by the Smart Waste Solution Lab officer, demonstrations and public visits were frequently held at the facilities for public to better understand the whole FWR system and the importance of food conservation. Siu and Xiao (2016) suggested that informational strategies such as information, persuasion and social support are significant for achieving environmental sustainability. This can be explained by Tran (2018), who found that providing information on waste and recycling improved individual recycling behaviour and helped develop a positive attitude towards recycling. According to Abadi et al. (2021), people with a positive attitude towards waste management tend to be more conscious of environmental problems and engage in more efficient and sustainable behaviour.

Improving waste management knowledge alone is insufficient to encourage the FWR practice, but convenience and easily accessible facilities could increase motivation to carry out recycling behaviour. The argument in terms of convenience has been pointed out by Comber and Thieme (2013) that there is a high potential to perform recycling behaviour when the possibility of perceived inconvenience is low. Based on a survey conducted by Siu and Xiao (2016) in the housing estate in Hong Kong, convenience is necessary for the public in designing waste recycling programmes. They further narrowed the convenience categories to two dimensions: time and energy.

A lack of time and energy for excessive activities is a crucial point where sustainable intentions do not translate into recycling behaviour. Waste separation is more time-consuming than regular waste disposal. Therefore, design considering reducing the allocation of time, spatial consideration, and equipment provision are the main approaches to encouraging FW separation practice in Chow Kit wet market, as these were the few challenges frequently highlighted by respondents during the interview. All the recycling facilities analysed in the case studies aimed for direct collection from the FW source. Three out of four case studies were in-house facilities, whereas only one stand-alone facility was located near its FW sources. This ensures a convenient and direct recycling network, saving time and energy for the FW collection and transport process. In order to generate the context of FW generation, market workflow and workspace should also be integrated into

the planning of FWm system. Identification of the current workflow and organisation of the workspace was carried out in the Chow Kit wet market. The researcher found that the space available for stalls was always limited. Based on observation, a single-stall space must contain a display, storage, and workspace. It was observed that the waste containers were stacked along the walkway. Vendors explained this as lacking space to store garbage in the common area. Therefore, a clear space division should be reflected in planning the stall organisation for a convenient FWm workflow. Research regarding organic waste recycling in urban restaurants by Vinck et al. (2019) also suggested integrating waste management devices in the workspace, such as cleaning and washing. According to the researchers, keeping containers close to the working space allows efficient workflow and ensures a clean working area. For example, the provision of equipment includes recycling facilities, collection points, material transfer centres and recycling centres. In short, the convenience and accessibility of the FWr system design were of great concern.

The findings also suggest that applying an appropriate system is paramount in the market FWm. As proven by the case study in OTH, installing an automated FW collection system increases their participation rate and improves the safety of FWm in the hawker centre. In addition to providing facilities, Xiao and Siu (2018) argued that attitudes and suggestions from different stakeholders should also be considered to ensure a long-term and effective recycling scheme. For example, a Chow Kit wet market sanitation worker highlighted the workforce and workload issues for managing market waste. According to him, the current waste management imposed a heavy workload on the sanitation worker due to handling a large amount of market waste, and cooperativeness from vendors was generally low. His concern was about additional burdensome duties to them if an FW separation enforcement is to be implemented in the market. Therefore, a more tightened enforcement can be implemented through application design. For example, regular or more frequent waste collection is suggested by some respondents. In OTH, the food segregation practice supporting the FWm programme was also incorporated into the tenancy agreements to ensure the tenants' commitment.

Mistrust in the recycling scheme was one of the challenges mentioned by respondents. The poor implementation of the previous scheme has decreased public enthusiasm and satisfaction. Most vendor respondents showed little interest in FWr during the interview due to the non-transparent recycling network and experience. Despite that, Vassanadumrongdee & Kittipongvises (2018) stated that mistrust could be reduced if policymakers set clear and effective policy measures on waste separation and recycling schemes for the public. According to a study on recycling behaviour, perceived policy effectiveness is defined as the perception of a specific policy measure referring to the public's feelings on how well the government provides effective and adequate policies. As concerned respondents, a clear recycling path should ensure a systematic process and clear information to acknowledge the purpose and usage of recyclables. Furthermore, rewards were one of the strategies respondents suggested to motivate their FW separation intention. It can be in the form of financial support, monetary rewards or commodity as feedback for active recycling. The incentive system is believed to be the stimuli that could contribute to changing attitudes and behaviours towards recycling. Siu and Xiao (2016) found that economic incentives could shift the degree of convenience in line with the discourse above. In their research on recycling management in high-rise housing, residents were willing to actively collect recyclables due to their recycling efforts' positive feedback.

Overall, the design and implementation of the existing waste management in the Chow Kit wet market do not effectively encourage FW segregation and recycling practices. Researchers and policymakers must reconsider ways to improve the existing market's FWm design to encourage pro-environmental behaviour. The research findings formed the basis for developing a design framework for FWr awareness in the Chow Kit wet market. The proposed design framework is illustrated in Figure 2.

In the proposed framework, the three final themes were perceived convenience, implementation and management, and an inculcated positive attitude. Each of the themes influences the provision of recycling facilities in the market. Firstly, ensuring the quality and accessibility of FWR facilities is exclusively important. Convenience can be improved through increased accessibility

by enhancing time-saving workflow, integrating efficient spatial design, especially in the vendor's workspace, and providing more infrastructure nodes accessible by more people. Providing recycling facilities alone is not enough to ensure long-term recycling behaviour. Secondly, it is necessary to ensure implementation and management of the design, as effective management can continuously enhance social collaboration. The FWr system implementation and management can be more effective through enforcement application design, exposure of the recycling process, and incentive system. These strategies can gain the public's confidence towards the recycling system. Thirdly, a positive attitude can be developed by increasing FWm education about recycling and its importance through engagement in shared responsibility programmes, information accessibility, and a habit formation setting to ensure behaviour changes towards a sustainable community.

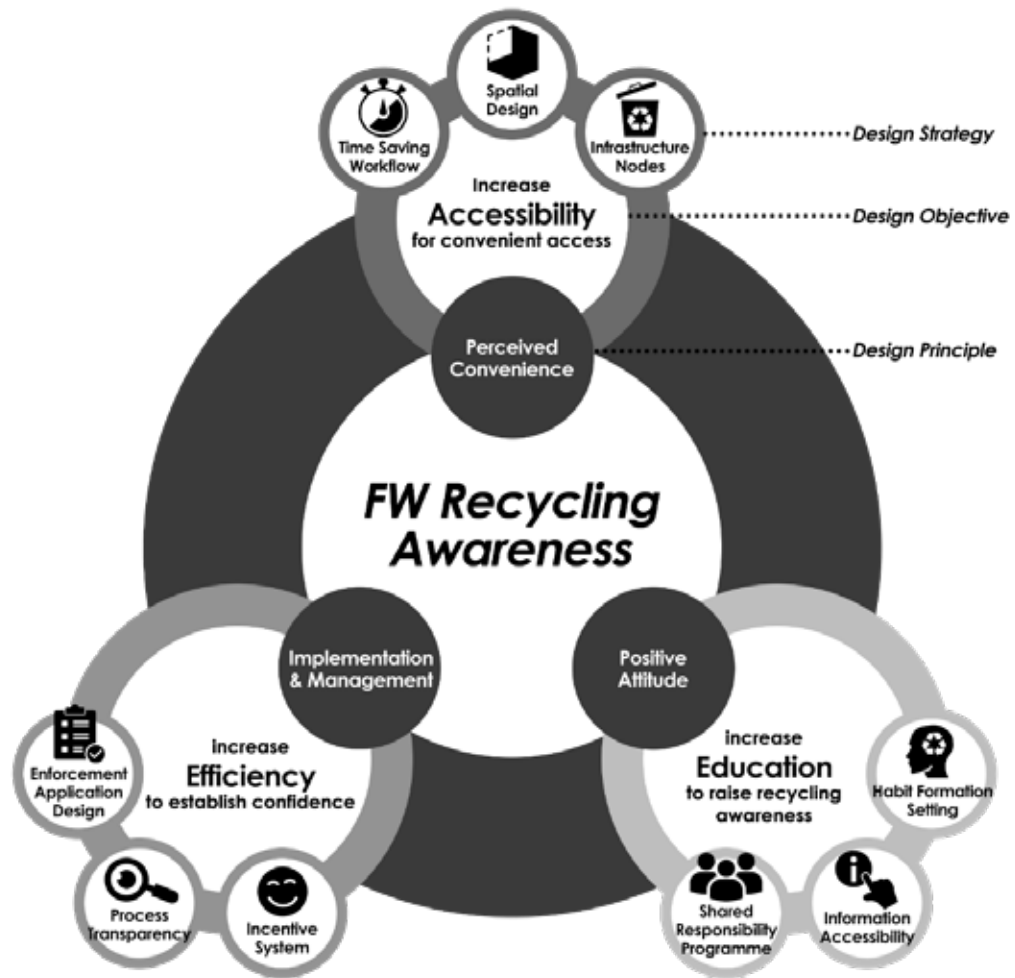


Figure.2 Proposed Design Framework for FWr awareness in Chow Kit wet market.
Source: Author

CONCLUSION

This dissertation explored the design framework for FWr awareness in Chow Kit Wet Market. The study investigated the challenges of FWr practices in the market and identified design strategies for integrating FWr for improved public outreach. Through interviews, observations, and case studies, the research provided valuable insights into the current state of FWm in the market and proposed a design framework to enhance recycling practices. The research findings revealed several significant challenges in FWr practices in the Chow Kit Wet Market. These challenges included convenience issues related to time, space, and equipment, vendors' attitudes towards waste separation, and the need for effective policies and enforcement. Lack of awareness, improper waste segregation habits, and mistrust in the recycling scheme were also identified as barriers to effective FWr. To address these challenges, the study proposed a design framework emphasising three key themes: convenience, implementation and management, and an inculcated

positive attitude. The framework suggests improving convenience by increasing accessibility to recycling facilities through efficient spatial design and infrastructure placement. Implementation and management can be enhanced through effective enforcement, transparent recycling processes, and incentive systems. Lastly, developing a positive attitude towards FWr can be achieved through educational programs, information accessibility, and habit formation. The proposed design framework offers a practical approach to integrating recycling into the market and enhancing public outreach.

Moreover, this research addresses the global issue of FW and its environmental impact. The study potentially addresses the SDGs beyond SDG 12, Responsible Consumption and Production. It promotes SDG 8, Sustained Economic Growth, through higher economic productivity and technological innovation on FWr, while sustaining inclusive economic growth of wet markets despite the rapid expansion of modern retailers. The findings of this research have practical implications for policymakers, market administrators, and other stakeholders involved in FWr. The design framework guides planning and implementing effective FWr systems in wet markets, fostering a more sustainable market ecosystem, creating economic opportunities, and upholding the cherished attribute of produce freshness that wet markets are renowned for.

This study focused on the specific context of a wet market. However, the case study samples are limited, with only a few relevant projects in Malaysia and Southeast Asia. Also, the findings may not directly apply to other food retail environments. Future research should consider exploring the applicability of the design framework in diverse settings. The sample size for the interview analysis was also limited. The research intended to receive 11 responses from both user and key-person groups. However, it was challenging to secure the key person's participation. Therefore, the gathered data may have an inherent bias in the participants' responses and limited generalisability. Future studies could employ quantitative research methods and larger sample sizes to validate and expand upon the findings of this dissertation.

Further research can explore specific architectural interventions to improve FWr practices in wet markets. This could include designing efficient FW segregation systems, innovative storage solutions for food scraps, and integrating recycling facilities within the market layout. Investigating the spatial organisation and circulation patterns that facilitate convenient and accessible FWr processes can be a valuable avenue for future research. Future studies can also explore using innovative materials and structural systems that promote FWr in wet markets. This could involve designing recyclable and biodegradable building components. Additionally, exploring sustainable construction methods and technologies that minimise waste generation during the building process can contribute to a holistic approach to FWr in wet markets.

ACKNOWLEDGEMENT

The authors sincerely thank the informants for their invaluable participation and insightful information for this research.

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EXPLORING THE DESIGN FRAMEWORK FOR RECYCLING CONSTRUCTION WASTE FACILITY TOWARDS LOWER CONSTRUCTION WASTE

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ABSTRACT

Construction industry creates an estimated third of the world's overall waste, and at least 40% of the world's carbon dioxide emissions in which lead to global warming. The rapid construction development is causing a serious impact from the huge amount of construction material waste in Malaysia. However, the awareness regarding waste management is generally low and there is less information on study of current waste management. Most construction waste in Malaysia are not recycled and usually end up in landfills occupying the valuable land. Thus, Malaysia have not been able to adapt sustainable practices effectively such as regenerating construction waste. This research will identify the challenges in existing construction waste management and explore the suitable design strategies to integrate construction waste recycling facilities in construction site. This research will contribute to the sustainable practice in construction industry. Future research should consider adding more innovative and architectural technology onto waste regeneration for sustainable.

Keywords: *construction waste; waste management; recycling facility; new building material; sustainable*

INTRODUCTION

The construction industry plays a pivotal role as a key contributor to the Malaysian economy. In recent times, this sector has experienced rapid growth and expansion due to various factors, including the modernization of lifestyle, increasing demands for infrastructure projects, changes in consumption habits, and the steady growth of the population. While this growth is beneficial for the economy, it has also brought to light the industry's significant environmental impact. One of the pressing concerns is the substantial amount of waste generated by construction projects. As the number of building projects increases, so does the volume of construction and demolition waste. This waste, generated from various construction activities such as building renovation, civil and building construction, site clearing, road construction, and demolition and excavation work, has numerous detrimental effects on both the environment and public health. To address this issue and promote sustainable development, it is imperative to implement effective construction waste management practices across all construction industries. Proper waste handling is essential to minimize the adverse impact of construction waste on the environment. By adopting responsible waste management strategies, the industry can significantly reduce its ecological footprint and mitigate the negative consequences associated with waste accumulation. Waste management encompasses a range of actions, including waste collection, recycling, appropriate handling, and proper disposal at construction sites. Through these measures, the aim is to remove or minimize the influence of contaminated waste materials from the immediate surroundings, leaving them free of harmful waste. By efficiently managing construction and demolition waste, the industry can contribute to environmental preservation and protect the well-being of both current and future generations.

Considering growing concerns about environmental degradation caused by increasing construction waste, the adoption of sustainable waste management practices becomes imperative for each construction project. Emphasizing the importance of proper waste management will lead to more responsible and eco-friendly practices throughout the industry. As we consider the importance of addressing construction waste management, it is also essential to promote academic integrity and originality in our work. To avoid any issues related to plagiarism, it is crucial to attribute the source when using information from other works. Proper citation and referencing should always be

applied to ensure the accurate representation of the sources used in our research and writing. This way, we can maintain the credibility and integrity of our academic endeavors while contributing to the advancement of knowledge and sustainable practices in the construction industry.

The construction industry, responsible for approximately one-third of the world's waste and over 40% of global carbon dioxide emissions (BBC, 2021), poses a significant threat to the environment, particularly concerning global warming. Construction waste, generated throughout building activities, contributes to these environmental problems. Proper waste management and sustainable practices are crucial to address these issues and reduce the industry's ecological impact. The built environment generates an immense amount of waste given that it consumes greater quantities of resources compared to what was required. Reconsidering waste management in construction requires applying a 'cyclic' as opposed to 'linear' method in design and construction. According to a 2012 study conducted by the Ministry of Housing & Local Government, construction, and demolition (C&D) waste accounts for 41% of the total solid waste generated. The construction industry's impact on socioeconomic development in every country has significantly increased in recent times. This can be attributed to the growing standards of living, increasing demand for infrastructure projects, evolving consumer behavior, and the natural population growth, leading to rapid expansion in the construction sector.

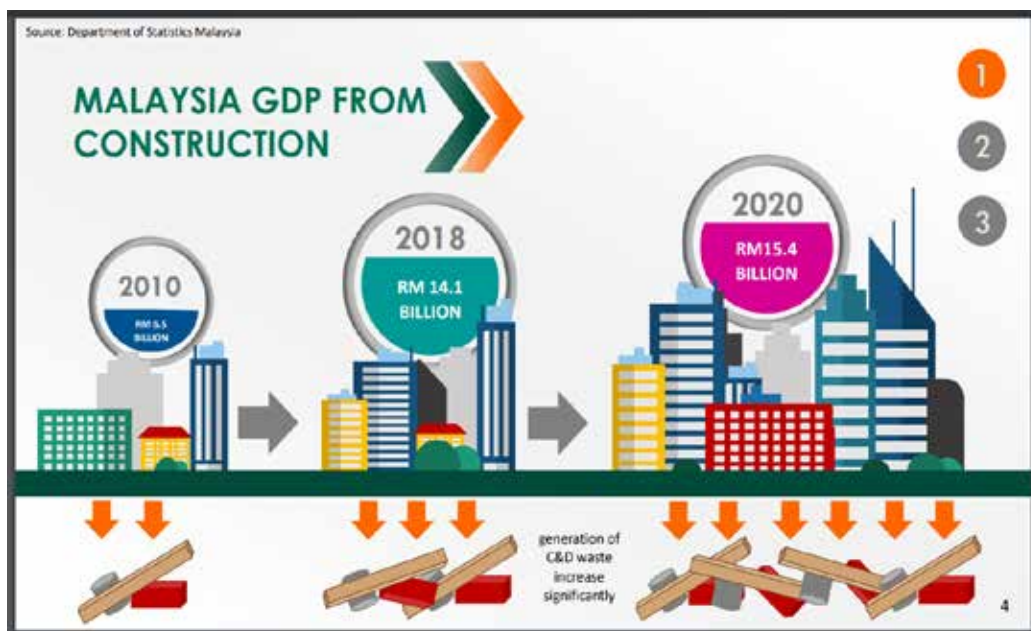


Figure 1.1.1 shows the impact of rising in Malaysia Gross Domestic Product affected by the accumulation of construction waste by CIDB 2021

Nevertheless, the rapid construction development is causing a serious impact from the huge amount of construction material waste in developing countries including Malaysia. As most developing countries' development speeds are far exceeding, the production of waste from construction projects have risen dramatically. As the human population has grown exponentially, and efforts taken to meet the fundamental needs as well as improving lifestyles for the masses also contribute to the production of additional waste. Malaysia has completed numerous construction projects, including high-rise commercial buildings, industrial buildings, schools, hospitals, and housing schemes. In Malaysia, the population is increasing rapidly along with the constant increase of Malaysia Gross Domestic Product (GDP) where it contributes to generation of tremendous quantity of waste generated by construction and demolition (C&D).

The construction sector holds immense significance in Malaysia's economic landscape and serves as the cornerstone of the country's development. In 2016, it contributed a substantial RM50.1 billion, constituting nearly 5% of the national GDP (MyCC,2017). The Eleventh Malaysia Plan (11MP) projects a remarkable growth rate of 10.3% per annum in the construction industry from 2016 to 2020, surpassing Malaysia's anticipated average economic growth of 5.0% - 6.0% per year (MyCC,2017). Despite this promising growth, the inefficiency in construction waste management, including the manufacturing of building materials, has had a significant adverse impact on the environment. Sustainability is becoming increasingly important in Malaysia's construction industry.

According to CIDB data, construction projects are anticipated to total about RM138.0 billion in 2017, up from RM131.0 billion in 2016. (CIDB,2016) The construction project forecasts and advancements within Malaysia's construction sector paint a promising picture of actualizing grand-scale infrastructure projects and making prudent investments for the country. Environmental problems, particularly the generation of construction waste, have been exacerbated by the growth of infrastructure, particularly in construction projects. Additionally, the demand for infrastructure was rising, which significantly impacted Malaysia's construction industry development (Khan,2020). Several variables, including the economy, demand, living standards, population increase, industrialization, and urbanization, are to blame for the rising amount of garbage generated. Construction waste generating issues have contributed towards illegal dumping practices. The unlawful dumping activities have a direct correlation to the rising garbage generation (CIDB,2021). Furthermore, there are several environmental elements that contribute to unlawful dumping activities.



Figure 1.1.2 shows the data on illegal dumping location recorded by CIDB 2021

According to a recent study by CIDB in 2021, Malaysia's illegal dumping of construction waste is getting worse. Construction site illegal dumping has had negative effects on the environment, community, and economy. Additionally, between 2014 and 2018, there are A grand total of 1446 incidents of unauthorized waste disposal, unlawful dumping, or improper waste disposal were recorded. extermination locations found in Malaysia mostly involving construction activities. Architecture must transcend the concept of mere eco-efficiency achieved through superficial environmental measures and instead, aim to embrace eco-effective practices by taking a holistic approach that eliminates waste from the design process. This approach should be firmly emphasized in tender documents and diligently implemented during the construction phase, recognizing the pivotal role the architectural profession holds as a central figure in the construction industry.

The present challenges in construction waste management encompass various issues, notably the rising occurrences of illegal dumping and the lack of information and skill development in handling proper construction waste flow (SWCorp, 2019). As per SWCorp's report in 2019, a staggering 1446 locations of illegal dumping were identified (CIDB, 2021), underscoring the existing deficiencies in construction waste management within the Malaysian construction industry. Ummi Kalthum Shuib, the director of SWCorp Malaysia, highlighted that construction waste accounted for 94.6% of the total illegal waste in the federal capital (Malaymail, 2023). This surge in illegal dumping can be attributed to the increasing demand for construction and refurbishment projects, as mentioned in the CIDB report (CIDB, 2021). Nevertheless, responsible bodies like SWCorp and CIDB lack proper guidelines and frameworks for organizing the recycling of construction waste. Consequently, a significant portion of construction and demolition waste in Malaysia is not recycled but ends up in landfills, consuming valuable land resources. The absence of effective sustainable practices, such as regenerating construction waste, hinders Malaysia's progress in embracing environmentally responsible approaches.

Construction waste poses a pressing global environmental challenge, contributing to issues like global warming, acid rain, air pollution, and climate change, demanding urgent action. If left untreated, construction waste can have detrimental effects on the environment (Badraddin et al., 2022). The construction industry, being the largest consumer of raw materials worldwide (Ghaffar et al., 2020), operates predominantly within a linear economic model characterized by high natural resource consumption and low resource recovery, commonly known as the “take-make-dispose” approach (Anastasiades et al., 2020). Immediate attention is required to address these concerns and adopt sustainable practices in the construction sector. There are also lack of article talks about recycling construction waste facilities that generate construction waste into new building materials. However, there has been lack of knowledge and skills in Malaysian construction industry towards recycling construction waste. Therefore, this study will formulate the suitable design strategies on recycling waste facilities for adaptation of renewing building material from construction waste to combat the increment of construction waste

Nevertheless, this problem has been heavily impacting the environment and arises the awareness from the industry due to the huge damages made. The issue of increasing in construction waste needs an urgent action on preventing this from worsen as it will heavily impact the environment and the quality of life. However, there have been lack of effort being made to tackle this issue successfully. Thus, this study aims to formulate the suitable design strategies on recycling waste facilities for adaptation of renewing building material from construction waste. This research will be focusing on the main research question which is what is the suitable design framework for construction waste recycling facilities for resource recovery? Based on the main research question, sub research question will be determined based on the outcome of interest which are the issues and challenges with the current management of construction waste in construction site and the design strategies for construction waste recycling facilities.

Literature Review: The literature review provides augmented understanding and basis on construction waste management through recycling practice. Besides, this review will explore on the issues and challenges with the current management of construction waste in construction site. This literature review will also be discussing on the design requirement for construction waste recycling facilities. The literature review is carried out via several databases such as Google Scholar and Science Direct, using several keywords which are construction waste, recycling, new building material, waste management.

Lack of construction waste recycling facility

Based on the literature review concerning the issues and challenges in the current management of construction waste in construction sites, Nawi et al. (2018) found that the existing disposal sites are insufficient to handle the increasing amount of waste generated by the construction industry. They also noted that in Malaysia, waste incineration is considered one of the most feasible methods to address the problem of construction waste disposal. However, it was highlighted that open burning leads to adverse environmental effects, including air pollution resulting from combustion emissions and high temperatures. Consequently, sustainability requirements are being overlooked in construction waste management, and these issues have significant impacts on the environment, necessitating urgent and effective alternatives to be implemented as solutions.

Furthermore, Umar (2021) proposed that promoting recycling and reusing of construction and demolition waste in Malaysia would not only mitigate the impact on natural resource consumption but also significantly reduce embodied energy. However, there remains a lack of understanding regarding construction and demolition (C&D) debris recycling, posing a challenge for the widespread introduction of construction waste recycling facilities. When compared to the prevailing methods in certain Western countries like the United States, Canada, the United Kingdom, and Australia, construction and demolition waste management in developing nations significantly trails. (Lu and Yuan, 2010). Particularly, there is an urgent need to support waste management strategies such as recycling construction waste and method-oriented approaches such as adoption of prefabricated components and prefabrication techniques.

Various recycling technologies for construction waste are readily available; however, several technical obstacles hinder their implementation. These barriers include a deficiency in knowledge and skills related to eco-technologies, limited waste reduction education and awareness among practitioners and on-site operatives, leading to insufficient skill sets during the construction process. (Guerrero, 2017) According to Umar’s findings in 2021, reusing and recycling waste

materials can lead to energy savings and a reduction in carbon dioxide (CO₂) emissions. Recycling various commodities consumes less energy compared to processing from virgin stock, and it also helps minimize transportation needs and their associated environmental impacts. However, in Malaysia, there is limited understanding of construction and demolition (C&D) debris, leading to its disposal in landfills. Waste reduction at the source receives less attention compared to reuse and recycling efforts. Presently, there are no legal or economic mechanisms in Malaysia to guide construction professionals in reducing waste generation and proper disposal, contributing to the lack of construction waste recycling facilities in the country. (Umar, 2021)

In 2021, Umar reported that a significant portion of solid wastes, approximately 95-97%, including construction and demolition (C&D) waste, collected in Peninsular Malaysia, is still disposed of at landfills. Only a small proportion, around 3 to 5%, undergoes treatment through incineration or recycling and reprocessing. This low rate of C&D waste recycling in Malaysia is in stark contrast to that of developed nations, and it can be attributed to factors such as a lack of data and a less favorable attitude towards recycling. In developing countries like Malaysia, making fully quantitative decisions is challenging due to limited knowledge and diverse data availability, which are more commonly accessible in developed nations. Additionally, Malaysia lacks institutional tools to enforce responsibilities on stakeholders and promote waste reduction, particularly in the construction industry, through source separation and minimized waste output. These limitations in data, attitude, knowledge, and institutional tools create barriers to the effective management and recycling of C&D waste in Malaysia, highlighting the need for further research and targeted interventions to enhance waste management practices in the construction sector. (Umar, 2021)

Low market demand for recycled waste due to cost inefficiency

Enhancing construction waste management practices is of utmost importance for industry stakeholders, particularly in Malaysia, to ensure the continued relevance of the construction sector. According to Maniam et al. (2018), numerous infrastructure projects and buildings have been constructed, leading to a significant burden and costly challenge in solid waste management due to the disposal of construction waste in landfills. Additionally, improper waste management poses risks to human well-being and the environment. Despite media attention on this issue for a considerable period, the measures taken to control waste generation have been limited. It was only after the environmental implications escalated that attention was drawn to construction waste and the need for better management practices. Therefore, addressing construction waste management is vital to safeguard the industry's sustainability and protect the environment. One of the most crucial factors in making decisions related to upcycling or otherwise is the balance between cost and benefit. In a construction waste recycling sector, companies are always concerned about profitability on upcycling waste. This is sensible given that sustainable business operations depend critically on reasonable recycling business revenues (Meng et al., 2017). According to Hasmoni et al. (2020), the most prevalent method of managing construction wastes in Malaysia is direct disposal to landfill sites, chosen by contractors due to the assumption of low value for the waste materials. However, this approach is not sustainable in the long term, given the significant volume of waste generated by the construction industry, leading to a continuous increase in construction waste, which exacerbates landfill congestion.

To address this issue, there is a pressing need for alternative waste management practices, focusing on waste prevention and the implementation of initiatives for waste reduction, reuse, and recycling in the construction industry. Kupusamy et al. (2019) also highlighted that illegal dumping has become a common problem and a shortcut solution used by some contractors managing construction projects in Malaysia. Consequently, it is imperative to adopt more sustainable waste management strategies and discourage illegal dumping practices for the betterment of the construction industry and the environment. The profit-driven nature of the construction business poses significant challenges in diverting construction trash from landfills. It is widely recognized that government pressure and incentives play a crucial role in promoting construction and demolition waste (CDW) recycling worldwide (Ajayi and Oyedele, 2017; Arm et al., 2017; Lu and Tam, 2013).

Financial barriers arise from the lack of viable markets for recycled construction materials, hindering efforts to recycle or minimize construction waste (Guerrero et al., 2017). The industry is hesitant to manage construction trash as it is perceived to increase project costs. Moreover, the absence of economic sanctions for improper waste management makes it difficult to reduce construction waste. Teo and Loosemore's study revealed that employees believe the financial benefits of waste reduction are not distributed. Additionally, there is a perception that waste

reduction initiatives are not practical, cost-effective, efficient, or compatible with primary building tasks. Employees also expressed reluctance in segregating materials with minimal economic value or those suitable for recycling or reuse.

Bao (2020) highlighted the importance of an effective facilitator in developing a demand-supply information sharing platform. Such a platform can address the long-standing issue of asymmetric market information in the recycled products trading market, promoting the free circulation of recycled items. To emulate Japan's successful practice, other countries aspiring to develop themselves can adopt similar approaches (Bao, 2020). The platform's success in matching supply and demand relies on the comprehensive and up-to-date information about recycled items. For enhanced public trust, the government should actively monitor and financially support the platform on a regular basis (Bao, 2020).

In order to establish recycling guidelines, Bao (2020) suggested involving a professional third-party, such as the Construction Industry Council, to ensure adherence to standardized norms. This information could then be incorporated into the supply-demand information sharing platform, providing immense benefits to users. To address the challenge of recycled product prices unable to compete due to high handling costs, the government can implement supporting policies like tax reductions for the use of recycled products or impose taxes on the use of virgin materials. Additionally, allocating more research and development funds can bolster the competitiveness of off-site recycling plants (Bao, 2020).

Low regulation and guidelines in handling construction waste

Moreover, the regulations and guidelines for managing construction and demolition waste generation in Malaysia are inadequate. The country also lacks reliable data and information concerning construction waste. Additionally, there is a notable lack of awareness and research dedicated to construction waste generation in Malaysia. The growth of the construction waste recycling industry has been impeded by the absence of supportive regulations and industrial policies (Jin et al., 2017). For instance, CDW recycling businesses faced challenges during their initial stages due to the lack of financial incentives from local governments (Liu and Huang, 2014). In contrast, the success of other developed countries like Germany and the Netherlands in achieving high levels of CDW recycling can be attributed to their well-established legal and political systems (Commission, 2015, Commission, 2015).

Institutional barriers are also evident, as designers often overlook waste reduction during the building design process. Inconsistencies between different governmental agencies and a lack of coordination among divisions in implementing environmental regulations further exacerbate the situation. The absence of well-defined waste management procedures (including collection, separation, transportation, and disposal of construction waste), lack of managerial commitment and support for better construction practices, absence of norms or performance standards for managing construction waste, and failure to integrate operatives' expertise and experience in waste management processes all contribute to the challenges faced in the industry. (Guerrero, 2017). Furthermore, within the organization, there is a lack of clarity in defining individual responsibilities for waste management, poor communication of these responsibilities, and a perception among operatives that waste management is not relevant. Additionally, studies have indicated that practitioners are less likely to prioritize waste management and recycling in projects unless managers prioritize it and provide necessary support, incentives, and resources (Guerrero et al., 2017). The importance of construction waste reduction practices tends to increase when a legal framework is in place that considers environmental regulations and recycling mandates. However, legal barriers hinder waste reduction practices due to insufficient policies, difficulties in implementing existing policies, and a lack of enforcement mechanisms.

Several researchers have proposed economic, technical, and institutional factors that contribute to the reduction of building waste. Chini, for instance, pointed out that the increasing disposal costs at landfill sites have incentivized the use of recycled materials. He also emphasized that public acceptance of recycled aggregates could be improved with the establishment of defined criteria for their use. Companies that prioritize waste management invest in various aspects, such as hiring waste management workers, procuring waste-minimization equipment and machinery, and enhancing workers' skills. Various technical barriers also impede effective construction waste management, including limitations in waste management site space, lack of low-waste construction technologies, inadequate service expertise with recycled materials, challenges in

developing specifications for recycled materials, and the absence of guidelines for their proper utilization.

According to Bao in 2020, governments should allocate funds for research and development to support off-site recycling plants in exploring advanced technologies for manufacturing recycled products. Additionally, there should be a focus on expanding the variety of existing recycled products produced by these plants. To foster knowledge sharing and dialogue on C&D waste recycling guidelines and regulations, research seminars involving multiple countries are strongly encouraged. (Bao,2020)

Options of system

Recycling of construction and demolition (C&D) waste can be broadly categorized into two methods: off-site/centralized recycling and on-site/decentralized recycling. In the on-site approach, when C&D waste is generated at the construction site, it is promptly sorted and segregated to determine if on-site reduction, reuse, or recycling is feasible. If not, the waste is transported to public fill banks, and the non-inert fraction is sent to landfills. Conversely, on-site recycling of C&D waste involves handling the waste at the construction site to minimize the need for transportation to off-site facilities. This method offers various benefits, including cost savings, reduced greenhouse gas emissions, avoidance of traffic congestion, decreased dust and noise pollution, and simplified on-site management (Vyncke and Vrijders, 2010). On-site recycling has been recognized as an effective solution for significantly cutting transportation, storage, and processing expenses by Burgoyne (2003). Similarly, Earle et al. (2014) view on-site recycling as a highly promising approach for establishing a profitable and sustainable waste recycling sector. However, on-site recycling does have some drawbacks. Studies have highlighted certain disadvantages, such as the potential inferior quality of recycled products due to inadequate cleaning facilities and the risk of causing noise and dust pollution in nearby residential areas (Ulubeyli et al., 2017; Kühlen et al., 2016). Overall, on-site recycling of C&D waste holds considerable potential, but it is essential to carefully consider and address its downsides.

Recycling plants can be categorized into two types: stationary and mobile. Stationary facilities, with capacities ranging from 100 to 350 tones per hour, typically employ advanced technology and sorting equipment to separate undesired fractions. These facilities are suitable for high-density areas, can produce high-quality products, and are efficient in creating a variety of recycled products of different grades. However, the initial cost of establishing such plants can be substantial. On the other hand, mobile facilities, with capacities of up to 100 tones per hour, process smaller amounts of construction and demolition waste (C&DW) in temporary demolition sites. They use basic technologies and often produce lower quality recycling aggregates through in-situ recycling (Ulubeyli, 2017).

While on-site recycling is considered promising and has demonstrated various benefits, it should not be solely relied upon and should be complemented with off-site recycling as a backup option (Bao and Lu, 2020). However, in some countries, the progress of off-site recycling has been hindered due to the lack of government policy support (Bao, 2020). For a sustainable construction and demolition (C&D) waste recycling sector, both on-site and off-site recycling should coexist (Bao, 2020). In cases where on-site recycling cannot handle all C&D waste or recycled products cannot be exchanged promptly, off-site recycling facilities can serve as interim storage or further treatment. Recycling plants typically produce more diverse and higher-quality recycled items, offering customers additional flexibility and further promoting the growth of the recycling industry (Bao, 2020). Therefore, the absence of support for off-site recycling also acts as a barrier to the implementation of on-site recycling in certain countries that lack government policy support (Bao, 2020).

Spatial design requirement

In major countries, construction and demolition waste typically comprises around one quarter of the total solid waste sent to landfills (Lu et al., 2017). Due to its substantial volume and negative impacts, researchers and practitioners have dedicated significant efforts to managing this waste. They have devised various measures, which can be summarized by the “3R” principle: reduce, reuse, and recycle. Reduction involves preventing the generation of C&D waste. Bao, Z. et al. (2018) suggested that off-site recycling is often more environmentally friendly, as all processes occur in a controlled environment. However, it comes with certain drawbacks, including significant investment, high land occupation demand, costly transportation, and associated nuisances.

On-site recycling, on the other hand, offers several benefits, such as easier management, lower investment, reduced transportation costs, and less dust and noise pollution in surrounding communities. However, these benefits are not automatically realized, as there are numerous barriers hindering widespread adoption of on-site recycling. Since these barriers are well-documented in the literature, a comprehensive understanding of them and potential facilitators to overcome them is highly sought after.

Furthermore, Ghaffar, S. H. et al. (2020) emphasized the importance of buildings sustaining the value of their materials, functioning as banks of valuable resources. Smart design and circular value chains are essential for reducing waste and the consumption of virgin resources in the construction sector. Many research projects have been focusing on innovative management strategies for construction and demolition waste towards a circular economy. The focus on environmentally-friendly practices and sustainable construction has led to significant interest in utilizing recycled aggregates in concrete production. This literature review aims to explore the characteristics and applications of a specific recycled aggregate plant and its role in concrete production.

METHOD

This study has the objective which are to identify the issues and challenges in the existing construction waste management in construction site and to explore design strategies for construction waste recycling facilities. Thus, researcher implemented interpretivism research philosophy in this study. Interpretivism involves researchers examining various aspects of the research, thereby incorporating human perspectives into the study. Interpretive researchers believe that the understanding of reality can only be achieved through social constructs like consciousness, language, shared meanings, and symbols. (Myers,2008) The chosen approach for this analysis is qualitative in nature. It involves employing purposive sampling and conducting semi-structured, open-ended interviews (Dudwick et al., 2006; Gopaldas, 2016). This model is recognized for its effectiveness as it takes place in a natural setting, enabling the researcher to gain in-depth insights through active participation in the actual experiences (Creswell, 2009). This data collection phase employs a variety of approaches, including in-depth interviews, desk reviews, and case studies. In-depth interviews will be used to collect the primary data, while desk reviews and case studies will be used to collect secondary data. The figure below depicts the process of a research methodology framework.

Research Question	Data sources
RQ 1: What are the issues and challenges with the current management of construction waste in construction site?	In-depth interview, observation
RQ 2: What are the design strategies for construction waste recycling facilities?	in-depth interview, desk review

Table.1 shows research question (Source: Author, 2023)

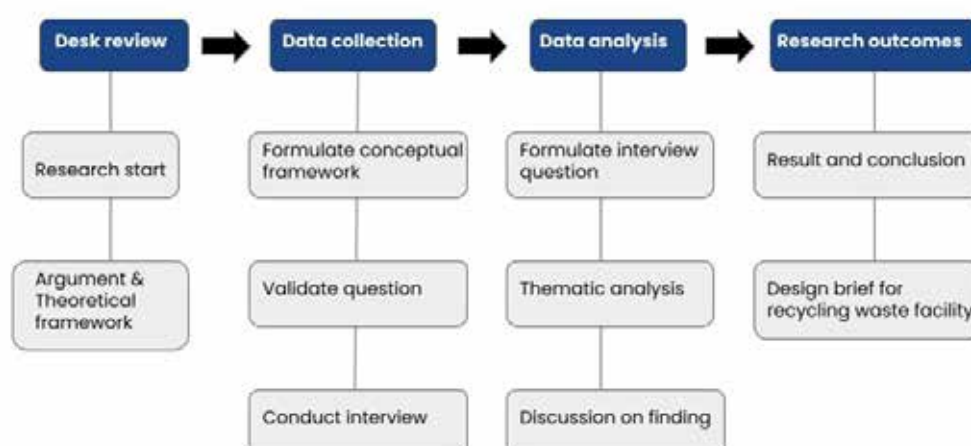


Figure.3 shows the sequence of methodology in the study (Source: Author, 2023)

The research on construction waste recycling within the design strategies of construction waste utilized in-depth interview and observation methodologies. These methods were employed to gain a comprehensive understanding of the specific issues, challenges, practices, and potential future improvements in building waste recycling. Consider the following interview and observation techniques: Existing literature was thoroughly studied before conducting the interviews. The collected insights were used to generate open questions in order to comprehend how current construction waste management works. Relevant theories or associated subject matter were gathered, and several were assigned to each of them. Questions were generated. A guide to the interview was developed based on these questions, which may be found in the appendix. The researcher did both the interviews and the observations. During the session, notes and images were taken with a phone in order to record the observations. Information and processes were documented as references about the design requirement. Furthermore, throughout the observation, the involved staff were questioned to acquire additional qualitative data. Respondents were given pseudonyms. Following that, all data was qualitatively examined.

Interview

Respondents were chosen according to their involvement in construction and demolition practices comprises of stakeholders from construction industries and important person including contractor and environmental officer, project manager, contractors and waste management company oversee managing waste in construction project. Interviews with various stakeholders assisted in gaining novel perspectives on the practice. There are around twelve people invited to be involved in interview session and seven of them agreed.

Respondent	Name	Age	Role	Acronym
Architect	Ar Nik Nur Zaidah	39	Design buildings for construction projects	A1
Environmental officer	Khairunnisa Abdul Rahman	34	Ensures the construction project follows environmental regulations and standards related to pollution and waste management	E1
Construction worker	Adya Singgih	35	Involved in building construction labor	W1
Clerk of work	Khairi Azfar	36	Inspects construction sites for workmanship, quality, and safety	C1
Material supplier	Ng Wooi Keong	48	Manage material for construction site and quality control of building material	S1
Material supplier	Avelyn Pon	33	Manage material for construction site and quality control of building material	S2
Site safety supervisor	Mohd Firdaus	45	Supervising the planning and execution of construction project	M1

Table.2 shows the respondents demographic in this study

Observation

Observation method was used to assist researchers through the process of gaining information, making observations, and assessing design requirement of a certain site or location.

Location	Type of operation	Direction
Mont Kiara, Kuala Lumpur	Construction project	Issue, challenges, and management
Persiaran TRX, Kuala Lumpur	Construction project	Issue, challenges, and management
Hi-Tech Mix Sdn Bhd, Rawang	Material supplier for construction project	Issue, challenges, and management

Table.3 shows observation direction in this study

Desk Review

Case study research is an empirical study that allows for reflective learning from another project with same characteristics. This study conducted a comparative analysis of waste recycling facilities. The purpose is to further assess the success strategies for construction waste recycling into new building material. Three case studies were selected for the study through desk review using secondary data from publications, websites, and official records. The chosen case studies are listed in the table below.

Case study	Location	Direction
On-nut Concrete Waste Recycling Plant	Bangkok, Thailand	Design strategy, management
Recycling Queensland Recycling Plant	Queensland, Australia	Design strategy, management

Table.4 shows the desk review in this study. (Source: Author, 2023)

RESULT AND DICUSSION

Observation

Construction site at Mont Kiara, Kuala Lumpur

Site location: Mont Kiara, Kuala Lumpur	Date: 7/11/2022	Start time: 3.00	Stop time: 5.00
The issues and challenges with the current management of construction waste			
Issues	No proper segregation area for waste material Exposure to hazardous materials in construction waste can lead to respiratory problems and other health issues.		
Challenges	Segregating waste according to material became challenging due to lack of proper infrastructure and technology		
Waste management method	All construction waste except for metal waste is collected and sent to landfill by assigned agent. The lack of recycling infrastructure hinders efficient recovery of valuable materials from the waste stream.		

Table.5 shows observation at Construction site at Mont Kiara, Kuala Lumpur

Construction site at Persiaran TRX, Kuala Lumpur

Site location: Persiaran TRX, Kuala Lumpur	Date: 28/11	Start time: 3.00	Stop time: 4.30
The issues and challenges with the current management of construction waste			
Issues	Lack of waste segregation infrastructure		
Challenges	Construction waste need to be segregated manually in effort of saving waste that have potential to be recycled		
Waste management	There is effort made to segregate construction waste for recycling however the effort could be improved with more proper and advanced infrastructure		

Table.6 shows observation at Construction site at Persiaran TRX, Kuala Lumpur

Hi-Tech Mix Sdn Bhd, Rawang

Site location: Hi-Tech Mix Sdn Bhd, Rawang	Date: 9/11/2022	Start time: 2.30 pm	Stop time: 4.00 pm
The issues and challenges with the current management of construction waste			
Issues	Continuous and high volume of waste production for strength and durability test before large batch of construction material are produced		
Challenges	Lack of facility for recycling construction waste		
Waste management	Waste is sent for disposal at landfill in which will later accumulate the landfill. Some of the wastes are given away to be used for road base.		

Table.7 shows observation at Hi-Tech Mix Sdn Bhd, Rawang

Summary from interview

Low awareness and education

Majority of construction industry experts, particularly contractors, engineers, subcontractors, and architects may be unaware of the environmental and societal consequences of building waste. They might be unaware of the resources being wasted, the negative environmental impact of improper waste disposal, or the potential benefits of recycling and waste minimization. This resulting to the lack of communication and collaboration among involved parties. The attempt towards sustainable waste management will be hampered unless there is appropriate awareness and education.

Construction waste management training and educational initiatives may be insufficient. Workers and building professionals may not receive adequate training in waste segregation, recycling

processes, and sustainable building practices. Due to a lack of training, it may be difficult to apply proper waste management practices on construction sites.

Governments may initiate education and awareness campaigns to educate stakeholders such as construction companies, developers, contractors, and others in the community about the need of recycling construction debris. These efforts can raise awareness, provide information on best sustainable practices, and emphasize the advantages of recycling.

Cost in handling construction waste

In certain circumstances, the cost of recycled construction materials may be higher than the cost of common materials due to extra processing and transportation expenses. Contractors, especially those in highly competitive markets, may prioritize savings on expenses, resulting in a preference for cheaper options in construction waste management. Incentives for recycling and lower total waste management costs could be created by encouraging the use of recycled materials and creating market demand.

The cost involving constructing and overseeing construction waste segregation facilities can be enormous, taking into account of infrastructure setup, employees, and ongoing maintenance. Stakeholders may be turned off by the financial implications and view the development of such facilities as a waste of money.

Construction debris recycling often involves additional processing, such as crushing, shredding, or grinding, to convert the waste into usable materials. These processes necessitate the use of specialized machinery and impose operational costs. If demand for recycled items is minimal or recycling facilities are inadequate, recycling can be more expensive than using raw materials.

Lack of technology and innovation

The development and improvement of technology and innovation for construction waste management may be constrained due to a lack of concentrated research and invention in the field. The construction sector has traditionally been slow to adopt new technology, with a lack of focus and investment in developing sustainable waste management systems.

The possible benefits of environmentally friendly construction waste management systems may be underappreciated. Some companies may be unaware of the long-term financial savings and environmental benefits associated with deploying innovative and sustainable waste management solutions.

The absence of standardization and regulations in sustainable waste management can be a hindrance to research and the development of new technology. Construction companies may be unsure about the technology to invest in or tactics to take if there are no commonly recognized practices. Because of the uncertainty, companies may take a conservative approach, sticking to traditional techniques.

Low regulatory compliance

In Malaysia, there may be a lack of regulations to enforce that requirement or stimulate the development of construction waste segregation facilities. Stakeholders will have less incentive to invest in these infrastructures if there are no explicit requirements or standards.

Stakeholders in particular might be unaware of building waste management legislation and regulatory requirements. This could lead to noncompliance and improper waste treatment or disposal. Firms who invest in effective waste management and recycling practices may face greater costs, making them unable to compete compared to competitors who disregard waste management and disposal standards. With this obstacle, implementing sustainable waste management practices becomes challenging.

Additionally, there may be an absence of definitive boundaries of accountability and duty, causing it difficult to determine who is responsible for ensuring compliance at various stages of the construction process. Noncompliance could go undetected due to a lack of oversight and monitoring.

Less demand for sustainable practice

The absence of well-defined guidelines and benchmarks for reused construction materials could impede the expansion of the market. Users may be mindful to use recycled materials in the absence

of specific regulations due to worries about their qualities, compatibility with existing systems, or compliance with building codes.

Many parties involved, such as contractors, developers, and architects are likely ignorant of the benefits and availability of retrieved construction debris. A lack of understanding could lead to the inadequate utilization of recycled materials in the market.

Insufficient infrastructure, such as a lack of recycling and waste processing facilities, may limit the quantity and availability of recovered materials. Without a strong supply chain and effective recycling facilities, meeting market needs and providing a regular supply of recovered materials will become challenging.

There is less incentive for innovation and investment in recycling and waste reduction technology when there is not much demand for sustainable practices. Sustainable waste management solutions frequently necessitate research, development, and investment. Firms may be hesitant to develop and execute novel technologies if there is no demand for them.

There is a common misconception that environmentally friendly practices have higher upfront expenses. As a result, some construction businesses and clients might favor short-term financial considerations over long-term environmental benefits, leading them to opt for conventional waste management methods that appear to be less expensive at first glance.

Location

To save transportation durations and expenses, the chosen location should be strategically positioned near construction sites. Short travel distances minimize the consumption of fuel and carbon emissions, making the facility sustainable. The facility's proximity to construction sites also encourages contractors to utilize it, as it becomes a quick choice for waste disposal and recycling.

Facility should be zoned appropriately to segregate incoming waste, sorting regions, processing units, storage, and administrative areas. To ensure smooth material flow, each zone should have distinct entry points and well-defined pathways. Location should be chosen with easy access to vital infrastructure and utilities including electricity, water, sewage, and waste treatment. The facility's proximity to utility connections diminishes the cost of installing essential facilities.

Centralized layout

A centralized layout should be considered in design strategy for a construction waste recycling facility which includes integrating various waste management operations and instruments in one central location. This strategy provides various advantages and considerations that can improve the facility's efficiency and effectiveness.

Spaces must also be arranged in a centralized manner. This centralization optimizes material flow, cutting the time and necessary to transport waste between processing units.

The potential environmental impact should also be considered when using the centralized layout, such as noise and dust pollutants. Mitigation measures should be employed such as acoustic barriers and dust suppression systems. A building waste recycling facility can streamline operations, optimize material flow, and enhance overall efficiency by using a centralized layout.

Flexibility and Future Expansion

The facility should be designed to be scalable in order to accommodate increasing trash volumes and recycling demands over time. It must be constructed to allow for gradual extension as the facility's recycling activities expand, as well as to allow for more trash processing equipment and storage facilities as surplus capacity grows.

Community Engagement and Education

Providing educational places and materials, such as galleries and exhibitions, to highlight the benefits of recycling and the facility's contributions to waste reduction and environmental preservation would increase public awareness. Collaboration with schools, universities, and public organizations should be pursued in order to develop educational education on waste management, recycling, and environmental conservation. Facility tours should also be held so that the public gets to experience the recycling processes and activities firsthand. Tours can highlight the facility's innovative technology, safety precautions, and beneficial effect on trash reduction and resource conservation.

Thematic Analysis

Main RQ: What are the suitable design strategies for construction waste recycling facilities for resource recovery?				
Aim of research: This research will formulate a design framework for construction waste recycling facility for adaptation of renewing building material from construction waste				
Research Questions	Deductive codes	Strategy of Inquiry	Inductive codes	
			Coding	Final theme
Sub RQ 1: RQ 1: What are the issues and challenges with the current management of construction waste in construction site?	Issues and challenges with current construction waste management	Desk review Interview Observation	Collaboration Training Implementation Government programs Inadequate training Additional costs Market demand Economic viability Contractor prioritization Limited research Slow adoption Insufficient attention Limited understanding Unaware legal requirements Higher Costs for Compliant Companies Lack accountability and oversight Lack standardized guidelines Misconception on higher costs	Low awareness and education Financial constraints Technology constraints Low regulatory compliance Less demand for sustainable practice
RQ 2: What are the design strategies for construction waste recycling facility?	Construction waste recycling facility design strategies	Desk review Interview	Near waste sources Minimize transportation distances Clear access Utility accessibility Streamlined material flow Efficiency improvement Scalable design Expansion capability Informative Spaces Institutions collaboration Facility tours	Location Clear flow Centralized layout Flexibility and Future Expansion Community Engagement and Education

Table.2 shows thematic analysis of this study (Source: Author 2023)

The study revealed several concerns and obstacles with existing construction waste management, including low awareness and education among construction professionals, financial constraints, technology constraints, low regulatory compliance, and less demand for sustainable practices. These obstacles inhibit effective waste management and recycling efforts. The study also sought to investigate design strategies for construction waste recycling into new materials. The data from observations, interviews, and a desk review were used to build a Thematic Analysis Matrix to act as a reference for the proposed design framework.

The study identified key design strategies for building waste recycling facilities, such as layout and space planning, location, centralized layout, flexibility and future expansion, and stakeholder participation. These solutions aim to optimize material flow, reduce transportation distances, and ensure the recycling facility operates efficiently.

On Nut Concrete Waste Recycling Plant in Bangkok, Thailand, and Recycling Queensland Recycling Plant in Queensland, Australia, were included in the desk evaluation. These case studies provided useful insights into the successful deployment of concrete and other building waste recycling facilities and procedures. The study selected real-life examples of waste management practices through site visits and observations at construction sites and recycling facilities. It shed light on the difficulties in waste segregation, the absence of recycling infrastructure, and significant environmental and public health hazards.

CONCLUSION

In conclusion, this research holds the potential to make valuable contributions to various stakeholders within the Malaysian construction industry, spanning all its stages. Its primary objective is to heighten awareness and advocate for the improvement and adoption of more sustainable practices in construction and demolition waste management. Encouraging stakeholders, including developers, contractors, designers, engineers, and clients, to participate in this endeavor is essential to foster empathy and sensitivity toward environmental concerns and the consequences of inadequate waste management. Physical waste, especially from construction, constitutes a significant portion of landfill material, with estimates indicating that 13-26% of landfill content originates from construction waste. This emphasizes the importance of emphasizing sustainable and efficient waste reduction methods across different construction phases (Nagapan, 2011).

This research aligns with the global efforts led by the World Health Organization (WHO) to achieve Sustainable Development Goals. It provides a framework for governmental bodies to stimulate innovative, sustainable solutions in social and economic development. Consequently, this study has the potential to address Sustainable Development Goals 11, 12, and 13, which focus on enhancing environmental conditions and fostering sustainability in cities, industries, and communities.

Beyond its role as an intervention to enhance construction waste management through architectural means, this research also serves the broader environment and communities by promoting higher quality and more sustainable ways of living. Additionally, it contributes to the long-term sustainability of construction waste upcycling by presenting innovative approaches that can be applied in construction practices. This study actively encourages the continuous life cycle of construction waste through upcycling, involving stakeholders such as developers, contractors, designers, engineers, and clients.

It is important to note that this research faced limitations in accessing articles and studies related to construction waste management. This limitation might be attributed to the absence of a comprehensive framework for construction waste management, particularly in Malaysia. Additionally, the scarcity of relevant case studies hampers the availability of references for designing recycling facilities for construction waste. Furthermore, the relatively low awareness of construction waste recycling on Malaysian construction sites contributes to the limited pool of case studies available for developing a design framework for construction recycling facilities.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude and I would like to thank everyone who has helped me throughout this research. I would be unable to complete the research without their guidance and assistance.

Firstly, I would like to express my heartfelt gratitude to my supervisor, Assoc. Prof. Ts. Dr. Mohd. Zairul Bin Mohd. Noor for his endless support and direction from the beginning to the end of this project. After that, I would like to express my gratitude to my group members and friends for always lending a helping hand when I needed it.

Aside from that, I would not complete this dissertation without the emotional support of friends and family. Throughout my master's programme, they have shown unconditional love and faith in me. Finally, I dedicate the success of this dissertation to every one of you. Thank you very much.

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INTERGRATE UPCYCLING PADDY WASTE AS AN ALTERNATIVE BUILDING MATERIAL FOR SUSTAINABLE COMMUNITY BASED ARCHITECTURE

Yim Fong Yee, Mohd Zairul Mohd Noor

ABSTRACT

Malaysia is one of the leading producers of paddy. The main residues from paddy cultivation are rice husk and rice straw. Rice husk and rice straw generated during the harvesting and milling process. It has gained 0.48 Million tonnes of rice husk with 3,176,593.2 tonnes production of rice straw in a year due to the emerging technological development in Agra-industry. According to Malaysia's national news agency, 200,000 acres of idle land will be planted with paddy. This will increase to about 30% of paddy production. Parallel, to these the production of paddy residue also increases. Malaysia will face the problem regarding the paddy residue or waste management in the future. Unfortunately, farmers is still remains the current cultural practice of disposal in Malaysia which are burning of rice straw in the remaining field and also, rice husk are being burned along the road that give the impact to the environment. This study are needed to identify the best sustainable practice to overcome this problem regarding the paddy residue management in the future. Future research can conduct qualitative study to look in-depth on the interface between reconstruct paddy waste upcycling management and also the design limitation of paddy waste use as alternative building material.

Keywords : *paddy waste upcycling , alternative, building material and design strategies*

INTRODUCTION

Malaysia being one of the leading producers of paddy. The main residues from paddy cultivation are rice husk and rice straw. Rice husk and rice straw generated during the harvesting and milling process . It has gained 0.48 Million tonnes of rice husk with 3,176,593.2 tonnes production of rice straw in a year due to the emerging technological development in Agra-industry. According to Malaysia's national news agency, 200,000 acres of idle land will be planted with paddy. This will increase to about 30% of paddy production.

Parallel, to these the production of paddy residue also increases. Malaysia will face the problem regarding the paddy residue or waste management in the future. In 2021, Figure 1 shows the total planted areas for paddy field in Malaysia was approximately 647.9 thousand hectares, a slight increase compared to around 644.9 thousand hectares in 2020. (Statista Research Department, 2023)

Unfortunately, farmers is still remains the current cultural practice of disposal in Malaysia which are burning of rice straw in the remaining field and also, rice husk are being burned along the road. (Shafie S. M., 2015) Regardless of this fact, both practices emit greenhouse gases and have huge effects on the surrounding areas population and environment. There are many environmental concerns related to the rice production system across the globe. One of the worries is the emissions of lethal greenhouse gases as a result of the different steps and procedures concerned with rice production and their contribution towards global warming. (Gurraj Singh, 2021)

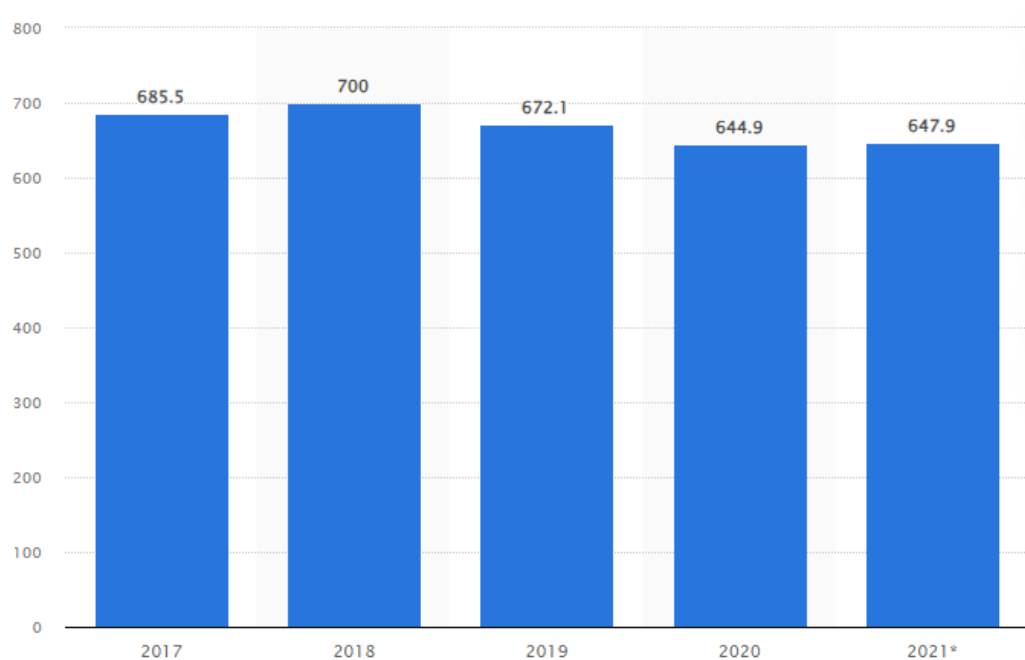


Figure 1 Areas planted with paddy field in Malaysia 2017-2021 (Statista Research Department, Mar 6, 2023)

“Open burning is the main cause of local haze. Although industrial and vehicle emissions contribute to poor air quality.” - Nik Nazmi Nik Ahmad, the minister for natural resources, environment and climate change.

Farmers is still remains the current cultural practice of disposal which are burning of rice straw in the remaining field and also, rice husk are being burned along the road in Malaysia. (Shafie S. M., 2015) Regardless of this fact, both practices emit greenhouse gases and have huge effects on the surrounding areas population and environment. There are many environmental concerns related to the rice production system across the globe. One of the worries is the emissions of lethal greenhouse gases as a result of the different steps and procedures concerned with rice production and their contribution towards global warming. (Gurraj Singh, 2021)

The Malaysian government has implemented various initiatives to encourage the sustainable management of paddy residue, including financial incentives for farmers who adopt sustainable waste management practices. Despite many researchers examining the study directions of operations management to reduce paddy residue, a comprehensive and human-based analysis of planning approaches regarding paddy residue open burning awareness is missing. In general, farmer’s knowledge of the environmental effects of paddy residue open burning could influence their intention to prevent such practices. Awareness should apply to the farmers and local communities to encourage a reduction of paddy residue open burning and adoption of alternative disposal methods in agricultural fields for promoting sustainable agriculture farmer’s outlook needs to be more towards the social approach rather a technocratic approach.

Open burning of paddy residue in Malaysia stems from the significant health hazards associated with this practice. Open burning of paddy residue is a prevalent agricultural practice in Malaysia, particularly in the states of Kedah, Perak, and Selangor. However, this practice leads to the emission of hazardous pollutants, including carbon monoxide (CO), nitrogen oxides (NO_x), and particulate matter, which contribute to air pollution and pose risks to human health (Azmi, 2019). Moreover, the burning of paddy residue releases large quantities of greenhouse gases, exacerbating climate change concerns (Talib, 2016). Despite the negative impacts, there is a lack of comprehensive studies and effective measures to address the issue of open burning of paddy residue in Malaysia.

Therefore, research is needed to investigate and propose sustainable alternatives and policy interventions to reduce and eliminate the detrimental effects of this practice on the environment and public health.

This paper aims to formulate a new design strategies for paddy waste upcycling to alternative building material in sustainable community based architecture. The objectives of this study are as follows:

RO1: To investigate the challenges of upcycling paddy waste as alternative building material in sustainable community based architecture.

RO2: To formulate a new design strategies for paddy waste upcycling to alternative building material to enhance sustainable architecture.

LITERATURE REVIEW

Importance of upcycling paddy waste

According to (Dominika Alexa,2021), the circular economy (CE) is one of the leading sustainable development strategies that can help utilize waste to produce new products from paddy waste. One of the key concepts of sustainable production is the circular economy. Waste materials can be used as secondary resources may contribute to reducing waste and its environmental impacts, depletion of virgin materials as well as substitution of emission intensive industrial production systems. The CE has gained attention as a way to overcome the current production and consumption model of “take, make and throw away” or the linear model based on continuous progress and increasing resource output. The “reduce, reuse and recycle” (3R) concept has nine steps from recovery to recovery. Industrial ecology, environmental economics, and environmental policy have influenced CE. (Fiore, E.,2020) Besides, these are also align with (Wenhao, 2019), upcycling waste is one of many CE approaches, which is promoted as a sustainable business model with great market potential for the agriculture sector.

Therefore, according to (Illankoon, 2023) it is necessary to combine them with feasible business models to facilitate the valorization methods for the rice industry by-products in many developed and developing countries such as Malaysia. If wastes are valorized as raw materials to complete parts of equipment through disassembly and remanufacturing, they can create value for entire supply chains, allowing additional markets for used components beyond the raw materials market and create a new development of sustainable alternative materials architecture using paddy waste. These openings are crucial because they establish an indirect market where resources, energy, and components from various waste streams in the rice value chain produce income for the communities.

According to (Belc, N,2019) , as agricultural waste generates CE benefits, paddy waste upcycling is not meant to degrade value like other industrial waste upcycling does. Due to the nature of systemically implemented operations, must be compared to materials that remain the same or lose performance when upcycled.

Based on (Fiore, E, 2020), agricultural food processing consists of a variety of value chains and generates different types of agricultural waste through the value chain from farm to fork. Large quantities of valuable wastes are produced during the harvesting and processing stages. And there are a needs, these wastes should be studied and analyzed to extract their valuable parts sustainably.

For example, paddy straws are produced in large quantities during paddy harvesting. These straws are commonly found in the field and are often used as fodder for animals and as bedding for livestock (Drake, D.J,2002) Additionally, according to (Illankoon, 2022) rice husk frequently becomes a material for burning and is discarded in landfills. The destruction of this valuable biomass without proper use will cause irreversible damage to the environment and all living beings on the planet. Bran is another by-product of the rice processing value chain. According to (Patsios, S.I, 2016) and (Fiore, E, 2020), after harvesting and milling, the by-products of the rice industry can be subjected to industrial symbiosis to exploit their full value.

According to (Barker, R,2014) , consequently, different production conditions affect the rice industry's waste. Therefore, waste calculation should include unused rice and other waste due to harvesting and processing errors. Consumer behavior and attitudes will determine how much rice is wasted at the end of the food value chain. Edible rice wastage is due to bad taste, rotting, and leftovers. (Mesterházy, Á,2020)

However, going from nature to architecture, without producing waste, focusing on man as the centre of an industrial process that is as sustainable as possible. Every primary agricultural production is associated to a considerable amount of secondary product, which is mostly unused and destined for disposal; even though, considering the production waste, the intrinsic market value of this material is potentially higher than its management and treatment cost. The huge potential of what is 'left in the field' can be exploited by developing concrete and feasible solutions, with a focus on turning agricultural by-products into a resource and a store of clean energy for the benefit of communities with regard to socio-economic and sustainable development.

Challenges of valorization of rice industry by-products

Rice Straw

According to (Abraham, A,2016), rice straw could also be valorized for four different purposes: energy production, animal feed, fertilizer, and building materials. One way to avoid those emissions is to use rice straw as a raw material for building products. A building façade panel using rice straw as its main component is presented as an alternative to the conventional double-layered brick façades. (Alberto,2021) The life cycle assessment (LCA) and the acoustic and thermal insulation of the rice straw façade compared to those conventional brick façade. Additionally, the surface and interstitial condensation have also been studied through a simulation. The LCA, conducted using the Environmental Footprint methodology, indicates that the rice straw façade has a lower impact on the environment.

The rice straw façade emits 78 % less CO₂e than the benchmark typology. If the emissions of either burning the straw or mixing the straw with the soil are subtracted, each square meter of rice straw façade prevents the emission of 18.85 kg of CO₂e and 52.64 kg of CO₂e, respectively. According to (Sanchis Jimenez., 2014), the most viable remaining waste management technique for farmers was to mix the straw with the soil and use it as a fertilizer. Although this practice might appear harmless, there is evidence that mixing the straw with soil may be as damaging as burning it. The anaerobic oxidation of the straw inside the paddy field generates a huge amount of CH₄, which has a global warming potential 28 times higher than CO₂.

According to (Singh and Arya, 2020) and (Singh et al., 2020), in light of the aforementioned factors, the most viable option for reducing the environmental impact of rice straw is to enhance its value by creating products that use it as a raw material.

For example, in Valencia, the valorization of rice straw would allow the rice industry to take part in a circular economy model that would have massive implications for the local society. If concrete is responsible for 8 % of the total carbon emissions in the world (Andrew, 2017). Using bio-based construction materials such as straw bale plays a key role in achieving carbon neutrality, not only to the low environmental impact of the materials themselves, but also to their low thermal transmittance (Cornaro et al., 2020).

Rice Husk

According to (Lingling Hu,2020), the utilization of this rice husk (RH) resource in a green and sustainable way has become one of the major environmental challenges. Converting wastes into construction material has become an important element in sustainable development. Furthermore, RH is another waste from agricultural sector that can potentially be recycled into value-added construction material.

For example, a company in Italy create a new RH-DECK system. RH-DECK system is designed for outdoor decking, but can also be conveniently used for indoors. The composite panel provides exceptional durability and resistance to all weather conditions, including situations with high

humidity. In fact, when immersed in water, it does not degrade. It manages to retain all its original properties for many years. Unlike wood, RH-DECK floors do not require oiling to maintain their original appearance over time. The requests for customization of size and appearance can be handled. (Ricehouse, 2016)

Besides, rice husk also can be use as a base lightweight screed, it created specifically for thermal-acoustic insulation of the base layers of horizontal surfaces. Among its peculiarities: lightness, ductility and breathability. It is designed to offer a solution that minimizes drying time, ensuring good workability during installation. Designed for new construction and also for thermal and hygrometric rehabilitation of existing buildings; including green building interventions and in the renovation of buildings of historical interest buildings. (Ricehouse, 2016)

However, there is a lack of studies on the use of rice straw and rice husk as a building material in Malaysia context. Accounting for the possible environmental benefits of using rice waste to build green construction material might foster their incorporation into Malaysia building market.

Development of sustainable alternative materials green buildings using paddy waste

Sustainability in building construction is now major priority as it is having various advantages. The global trend is moving towards the sustainability and hence sustainable building construction has prime importance in the construction industry. Due to huge urbanization activities lot of environmental issues are originating. Building construction using sustainable materials will lead to reduction in the pollution and also improve the existing situation of environmental problems. (Patel, 2021)

Defining sustainable planning and development as a philosophy will help the understanding and identification of the most appropriate approaches to maximize quality and minimize the environmental impact of developments (Sodagar, et.al. 2006). Align with (Aziz, 2005). the definition presented by the World Commission on Environment and Development, sustainable development meets the needs of existing generation without causing any obstacle for next generations to respond their needs. Besides the mentioned definition, there has been many presented definitions for sustainable development so far, but totally a collection of the existing definitions of the sustainable development can be presented as responding the needs of next generations, paying attention to bearable capacity of the ecosystems, making the human life sustainable, preserving the environment and integrating the preservation and development as a general approach.

Besides, sustainability is also discussed in the field of architecture and today is one of the important topics of these scientific field. Causing the least damage to the environment, regarding the biological diversity, using the pure and renewable resources, utilizing the recyclable regional materials, preserving and revivification of the historic places and paying attention to the economic and cultural issues of each society are some of the matters that are regarded by the sustainable architecture (Qobadian, 2012).

Figure 7 shows the rules for green building construction. The practical development fuses various techniques during plan development and activity of building venture. Utilizing green material is one among the manageable plan activity and development systems. The green materials are ecologically capable materials as they help with falling natural effects (Greenomics) asset effectiveness, indoor air quality, energy proficiency and reasonableness should be the critical highlights of the practical structure materials. Green structure rating for coordinated environment appraisal. Green building material that has little or no impact or a positive impact on the surroundings. Most green materials are composed of recycled materials that assist the environment and use of waste energy in a better way, the energy needed in manufacturing them is also reduced. (Sangmesh B, 2023)



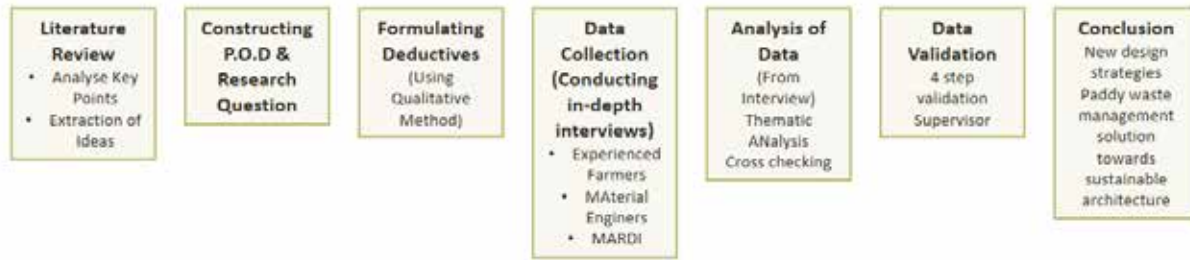
Figure 7. Rules for green building construction.

According to the (Mangesh V,2012), the production of conventional building materials such as cement, bricks and steel consume a lot of thermal and electrical energy and in turn pollute air, water and land. The use of appropriate building materials has not received adequate attention. Disposal of waste generated from agricultural production activity is another serious problem in developing countries. The major quantities of wastes generated from agricultural sources are sugarcane bagasse, rice husk, jute fibre, coconut husk, cotton stalk, etc. Reuse of such wastes as a sustainable construction material appears to be viable solution not only to pollution problem but also to the problem of the land-filling and high cost of building materials.

METHOD

The research methodology in this study consists of three main stages: an observational study, expert interviews to assess the identified issues, and the formulation of potential solution recommendations to enhance sustainable architecture through upcycling of paddy waste as an alternative building material. The qualitative study aims to identify the issues related to current paddy waste management in Malaysia, identify gaps for improvement, and propose design guidelines or strategies for enhancing sustainable architecture through the use of paddy waste as an alternative building material. The research will involve desk reviews and interviews with experts and material engineers experienced in designing alternative building materials. The study's goal is to develop new design strategies for upcycling paddy waste into alternative building materials within a sustainable community-based architecture. It aims to contribute to the field by offering a framework for new design strategies for paddy waste upcycling to alternative building material

in sustainable community based architecture. The deductive codes used in this study include challenges of upcycling paddy waste, paddy waste as alternative building materials, sustainable architecture serving as the basis for data analysis and supporting the theoretical construct.



RESULT AND DICUSSION

Thematic analysis is utilized to identify inductive codes and categories related to these challenges. Before developing interview questions for data collection, the main research question and sub-research questions are established, providing guidance for the scope and focus of the interviews. This helps determine the appropriate informants to be included in the study. Additionally, interview transcripts are analyzed as supplementary data, and a thematic analysis matrix is employed to categorize the identified codes according to pre-defined qualitative data themes (refer to Table 4.1). The collected data is then divided into distinct categories to facilitate focused analysis. Each coding is assigned to different themes for each sub-research question, ultimately resulting in the generation of final themes. The findings highlight the prominent inductive codes of “Challenges” and “Design Strategies” as the major themes derived from the data analysis.

Sub Research Questions	Inductive codes	
	Coding	Final theme
RQ1 : What are the challenges of upcycling paddy waste as alternative building material in sustainable community architecture?	Coding 1 : Resources efficiency in architecture Coding 2 : Material innovation Coding 3 : Sustainable design practises Coding 4 : Cost Coding 5 : Aesthetic and cultural identity	Theme 1 : Viability of paddy waste Theme 2 : Adoption of paddy waste

Table 4.1 : Thematic Analysis Matrix

Sub Research Questions	Inductive codes	
	Coding	Final theme
RQ1 : What are the challenges of upcycling paddy waste as alternative building material in sustainable community architecture?	Coding 1 : Resources efficiency in architecture Coding 2 : Material innovation Coding 3 : Sustainable design practises Coding 4 : Cost Coding 5 : Aesthetic and cultural identity	Theme 1 : Viability of paddy waste Theme 2 : Adoption of paddy waste

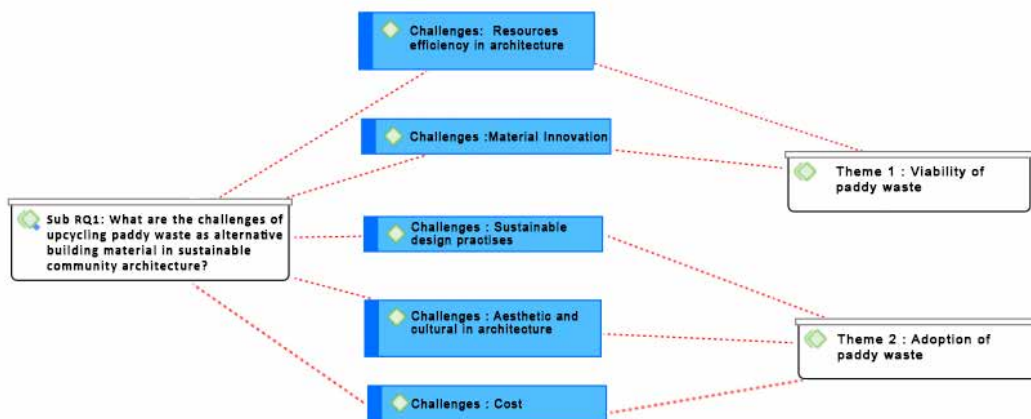
Table 4.1 : Thematic Analysis Matrix

Based on the in-depth interviews with experts, the findings emphasize the potential of paddy waste as an alternative building material and its positive impact on sustainable architecture. Utilizing paddy waste offers several key benefits. Repurposing paddy waste by-products that would otherwise be discarded or burned helps tackle waste management issues, reducing environmental pollution. Besides, incorporating paddy waste into building materials promotes resource efficiency and reduces reliance on traditional construction materials like bricks or concrete, which have high carbon footprints. Agricultural residues, such as rice husk and rice straw, generate a significantly

larger amount of waste compared to the actual products. Thus, utilizing these agricultural waste materials as sustainable substitutes can meet the demand for efficient building materials.

However, there are challenges associated with the use of paddy waste as a building material. Variability in paddy waste composition poses a key challenge. Additionally, regulatory and standardization issues need to be addressed to ensure the successful implementation of paddy waste in building materials. Utilizing different agricultural residues as sustainable alternative materials for building construction contributes to the reduction of greenhouse gas emissions and aids in mitigating climate change.

Paddy waste-based materials also offer good insulation properties, providing thermal comfort and reducing energy consumption for heating and cooling in buildings. Moreover, these materials have the potential to enhance the aesthetics of sustainable architecture, offering a unique and natural texture. Overall, incorporating paddy waste into the design of sustainable architecture not only addresses waste management challenges but also contributes to the creation of environmentally friendly and visually appealing built environments.



Thematic Network for Theme 1 – Challenges Of Paddy Waste

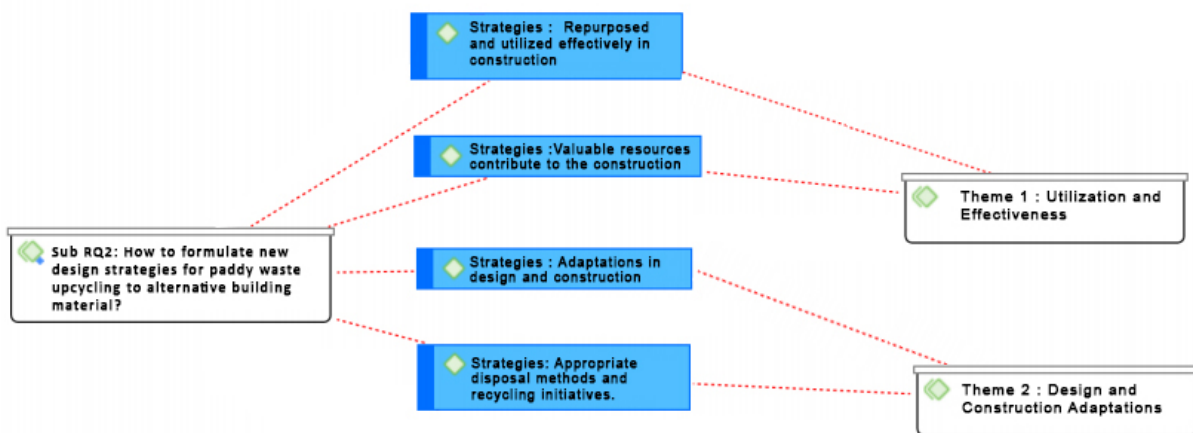
The first theme questions sought to identify the lack of resources from the current situation which exacerbated by the lack of government intervention and stakeholder involvement. Although Paddy waste, generated as a by-product of rice cultivation, poses various ecological risks if not properly managed. However, the absence of comprehensive waste management policies and initiatives at the government level hampers effective solutions to this issue. Without clear guidelines or regulations, farmers and agricultural communities often resort to burning or improper disposal of paddy waste, leading to air pollution and adverse impacts on ecosystems.

Furthermore, the lack of active participation from stakeholders, including government bodies, agricultural associations, and industry representatives, further compounds the problem. The absence of coordinated efforts and collaboration prevents the development of sustainable waste management strategies. The government has a crucial role in establishing policies and regulations that promote responsible disposal and utilization of paddy waste. However, the lack of prioritization and resource allocation to address this issue hinders progress in finding innovative solutions. Engagement from stakeholders is equally essential.

Agricultural associations can play a significant role by promoting awareness campaigns, providing education and training on sustainable waste management practices, and facilitating partnerships between farmers and construction industry professionals. Industry representatives, including architects, builders, and material manufacturers, can actively explore the potential of paddy waste as a building material and support research and development efforts. By investing in innovative technologies and processes, they can create a demand for paddy waste as a valuable resource in construction.

To address the paddy waste management issue effectively, collaboration between government bodies, agricultural associations, industry stakeholders, and research institutions is crucial. Governments should prioritize the development of comprehensive waste management policies, offering incentives for farmers to adopt sustainable practices and establishing channels for waste collection and recycling. Additionally, agricultural associations can advocate for sustainable waste management practices, provide training programs, and facilitate collaborations between farmers and other stakeholders. Industry representatives must invest in research and development to find innovative ways to process and incorporate paddy waste into construction materials, encouraging its adoption and reducing the reliance on conventional resources.

In conclusion, the management of paddy waste faces significant challenges due to the lack of government intervention and stakeholder involvement. However, by addressing this issue collectively and promoting collaboration between all relevant parties, we can develop sustainable waste management solutions, harness the potential of paddy waste as a valuable resource, and pave the way for a more environmentally conscious and resource-efficient future.



Thematic Network for Theme 2 – Design Strategies for paddy waste upcycling to alternative building material

The second theme questions sought to identify the type of design aspects that is required or to be taken into considerations when adoption paddy waste. Design considerations of using paddy waste as alternative building materials are crucial in the construction field.

When adopting paddy waste as an alternative building material, several crucial design considerations must be taken into account. By considering these aspects, architects can successfully integrate paddy waste materials into construction projects, creating sustainable, safe, and aesthetically pleasing designs that contribute to a more environmentally conscious built environment.

The lack of sustainable design practices poses significant challenges to environmental conservation and resource management in the built environment. Sustainable design in architecture is centered around minimizing the environmental impact of buildings and promoting responsible resource management.

By adopting paddy waste as a building material, architects can actively contribute to sustainable design practices. By incorporating paddy waste into architectural projects, architects can lower the overall carbon footprint associated with construction and contribute to mitigating climate change.

Furthermore, using paddy waste aligns with sustainable design principles that prioritize waste reduction and the utilization of renewable resources. Instead of discarding paddy waste, which would typically be burned or left to decompose, architects can harness its potential as a valuable resource. This approach reduces waste generation, promotes a circular economy mindset, and supports the concept of upcycling materials.

Architects not only contribute to sustainable design practises by using paddy waste as a building material, but they also motivate others in the construction industry to prioritise environmental considerations. This shift towards more environmentally friendly materials and construction methods has the potential to drive systemic change and promote a sustainable built environment

for future generations. In summary, adopting paddy waste as a building material in architecture aligns with sustainable design principles by reducing environmental impact, promoting responsible resource management, and encouraging waste reduction. By embracing paddy waste as an alternative to conventional building materials, architects can play a crucial role in creating more environmentally friendly structures and fostering a sustainable future for the built environment.

Design and construction adaptations play a crucial role in effectively utilizing paddy waste as an alternative building material. To ensure its successful incorporation into sustainable architecture, several key considerations need to be taken into account. Firstly, material processing and treatment are essential. Paddy waste requires appropriate processing and treatment to enhance its properties and suitability as a building material. Techniques such as drying, grinding, and sieving are employed to obtain consistent particle sizes and remove impurities. Additionally, treatments like stabilization, moisture-proofing, and fire retardation may be applied to improve the durability and performance of paddy waste as an alternative building materials. (M._Bassyouni, 2015)

Secondly, structural design and engineering must be carefully considered. Buildings utilizing paddy waste as an alternative building material should account for its specific characteristics. Load-bearing capacity, flexibility, and compatibility with other construction materials need to be taken into consideration during the structural design process. Structural calculations and simulations are essential to ensure the structural integrity and safety of the building.

Thirdly, integration with traditional building techniques is important. Paddy waste as alternative building materials may require adaptations to traditional construction techniques. Builders and craftsmen need to be trained on the appropriate handling, mixing, and installation methods specific to these materials. (M._Bassyouni, 2015) Striking a balance between incorporating new, sustainable materials and maintaining familiar construction practices is crucial to ensure successful implementation. Additionally, thermal performance and insulation should be optimized. Paddy waste as an alternative building materials possess inherent thermal insulation properties.

According to (Qing Yin,2023), designers should leverage this advantage by incorporating appropriate insulation strategies, such as optimizing wall thickness, incorporating cavity walls, or using insulating coatings. This helps enhance the energy efficiency of buildings and reduces the need for additional heating or cooling. Furthermore, aesthetics and architectural integration play a vital role. Architects and designers have the opportunity to integrate paddy waste-based materials harmoniously into the overall architectural concept.

Exploring innovative design solutions, such as utilizing paddy waste materials for decorative elements, interior finishes, or façade treatments, can enhance the visual appeal of sustainable architecture and showcase the unique texture and characteristics of these materials. Lastly, monitoring and maintenance are critical for the long-term performance and durability of buildings constructed with paddy waste as alternative building materials. Regular inspections, timely repairs, and preventive measures help address potential issues and extend the lifespan of the structure. By considering these design and construction adaptations, the use of paddy waste as an alternative building material can be optimized. This facilitates the creation of sustainable architecture that combines environmental benefits, structural integrity, and aesthetic appeal, ultimately contributing to a more sustainable built environment.(Qing Yin,2023)

CONCLUSION

In conclusion, the purpose of this research is to formulate a new design strategies for paddy waste upcycling to alternative building material in sustainable community based architecture.

Upcycling paddy waste into alternative building materials offers exciting opportunities for sustainable community-based architecture. First, thorough research should be conducted to understand the properties of different types of paddy waste, such as rice straw, husk, and ash, to determine their suitability for building materials. Composite materials can be created by combining paddy waste with eco-friendly elements enhancing their strength and durability. Exploring bio-based binders as alternatives to cement can reduce environmental impact. Modular building systems utilizing paddy waste components allow for flexibility and adaptability. Additionally,

the thermal insulation properties of paddy waste materials can be utilized for energy-efficient building envelopes. Structural applications should be thoroughly tested and analyzed to ensure safety and compliance. The use of sustainable surface finishes and coatings can enhance the aesthetics. Conducting a life cycle assessment is crucial for evaluating the environmental impact. Collaboration and knowledge sharing among professionals and local communities, as well as education and awareness initiatives, play vital roles in promoting the adoption of paddy waste upcycling in sustainable architecture. By integrating these strategies, sustainable community-based architecture can be achieved, contributing to resilient and resource-efficient communities.

ACKNOWLEDGEMENT

First and foremost, I would like to express my sincere gratitude to my dissertation supervisor, Dr. Mohd Zairul bin Mohd Noor for his support and guidance of my dissertation paper. The feedback, suggestions, and constructive criticism have helped me to refine my research questions, design a robust research methodology, and present my findings in a clear and concise manner.

I would also like to express my appreciation to the various scholars, researchers, and practitioners in the fields of sustainable design and construction, architecture, and engineering. Their extensive body of work and research findings have been critical in shaping my understanding of the subject matter and have provided valuable insights into the use of upcycling paddy waste as a building material for sustainable community-based architecture.

Moreover, I would also like to acknowledge the communities and individuals from community site A in Sekinchan, who have been at the forefront of incorporating sustainable design and construction practices into their lifestyles and community infrastructure. Their commitment to social responsibility and sustainability has been an inspiration for my research and serves as a model for future implementation of sustainable building practices.

In conclusion, I hope that my research on integrating upcycling paddy waste as a building material for sustainable community-based architecture can serve as a foundation for future studies and implementation of sustainable building practices.

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INTEGRATING URBAN STRATEGIES FOR WASTE COLLECTION FACILITIES IN URBAN PUBLIC SPACE

Dayando Jivinsol Moosom, Mohd Zairul Mohd Noor

ABSTRACT

The growing generation of urban solid waste in Malaysia has caused waste collection centres to play a prominent role in engaging communities recycling behaviour as waste segregation and recycling practices are necessary to achieve a sustainable city. It is necessary to transform and conceive these facilities as a public space in the city. However, there are little study on the design strategies for recycle facilities that focus in the integration into urbanscape of cities, a model which blur this facilities into the landscape of public spaces. Therefore, this study aims on generating a design strategies that integrate waste management facilities into the design of urban space to seamlessly blend waste infrastructure into the urban environment of Malaysia. The research objective is firstly to identify the barrier of existing waste collection facilities integration in public space. Secondly, to evaluate the key design strategies to integrate waste management in the design of public space in urban environment. Thus, a survey questionnaire method is used in this study to obtain the preference factor from the public in urban areas. The findings are expected to lead towards recommended design strategies to integrate recycling facility in the design of public space and will contributes key design strategies to integrate recycling facility in the design of public space for improve social acceptance of such facilities to exist within cities and benefit municipals and organisation body in tailoring a new model of waste management facility which not only serve as a processing and treatment function but seamlessly blend waste infrastructure into the urban environment.

Keywords: Waste collection center; Public Engagement; Public space; Recycling

INTRODUCTION

Malaysia is a growing nation, and due to its rapid economic expansion, urbanisation, industrialization, wealth, and population growth have all been seen to be accelerating. But the amount of solid trash produced in the nation has also significantly increased as a result of the country's growing population and prosperous lifestyle. The management of solid waste is becoming a major environmental and public health problem. Based on the latest data, Malaysia's population is estimated to grow at a rate of 2.4 percent (an addition of 600,000 people) every year, which will worsen the garbage generation situation. The municipal solid waste management system is rapidly getting exhausted and landfills are reaching its limit earlier than expected. A recent report by the 'World Bank' concludes that without urgent action, global waste will increase by 70% compared to current levels by 2050, often making traditional disposal methods insufficient and landfill sites inadequate.

Litter adversely affects the environment, rubbish are making its way into our rivers, forests, lakes and oceans, and, eventually can pollute waterways, soil or aquatic environments. Based on recent data, 7 billion tons of debris enter the world's oceans annually and most of it is long-lasting plastic (World Economic Forum 2022). Every year, Malaysia loses an estimated RM476 million in recyclable resources in an industry that is considered as high value, simply because recycling practices have yet to become a norm in this country (New Strait Times, March 2022). Currently the national recycling rate sits at 33.17% which is lower than neighboring countries such as Singapore, Taiwan, Korea, and Thailand (Bernama news, Dec 2022). The Federal government has set a target recycling rate of 40 percent by 2025.

In order to increase the nation's recycling rate, a number of programmes have been implemented, highlighted in a news article by The Star News, including community awareness campaigns, an increase in the number of public recycling facilities, and the conducting of events like Trash To Cash (T2C). Households can either trade in or sell recyclable and second-hand items through the T2C initiative. The Waste Zero Community Programme is another programme, a recycling facility in People's Housing Project (PPR) neighbourhoods that educated the neighbourhood on solid waste segregation and fostered the habit of valuing waste as a resource.

Problem Statement and Research Gap

It has become inevitable that waste segregation & recycling practice by the community are no longer an option but a necessary to achieve a healthy lifestyle and at the same time protecting our environment. The Solid Waste and Public Cleansing Management Act 2007 (Act 672), was enforced on Sept 1, 2015, which made compulsory for every household and business premise owner to segregate waste at the source. There has not been much improvement in the recycling rate, many people forgot about the Act as soon as the public campaigns regarding the new law died down. The government's Solid Waste and Public Cleansing Management Act 2007, which makes it compulsory for residents to separate their solid waste according to the categories of paper, plastics and others, has not produced the desired results. The Act, also carries a fine of between RM50 and RM500 for landed property owners and joint management bodies that fail to separate their waste (Bernama News, 2022). Most of the waste recycling process in Malaysia are being isolated away from its community, and people still associate these facilities ugly and unwelcoming, being only functional places like factories. In order for recycling habits to be practiced at a larger scale, it is necessary to develop & transform these facilities that integrates their cycle with society for its existence to have a more social value in the urbanscape. However, there are little to no design strategies for recycle facilities that focus in the integration into urbanscape of cities, a model which blurs this facilities into the landscape of public spaces.

A study states factors such as waste policy, communication and physical factors were the most important aspects in influencing recycling rate or output (Oluwadipe, S., Garelick, H., McCarthy, S., & Purchase, D. 2022). Other study, propose multi-pronged integrated approach for improvement that achieves sustainable SWM concept and action plan framework. (Shekdar, A. V. (2009). Another recent study proposes the use of a waste management procedure based on the technical development and practical implementation of a "Multi-Waste Plant", an example of a circular economy model (Hidalgo, D., Martín-Marroquín, J. M., & Corona, F. (2019). Current trend of waste management model only limited to sustainable concept and policy but none of the studies introducing spatial design approaches integration waste management facilities into urban public space.

Hence, the objectives of this study are as follows:

Objective 1: To identify the barrier of existing waste collection facilities integration in public space

Objective 2: To evaluate the key design strategies to integrate waste management in the design of public space in urban environment

LITERATURE REVIEW

Public perception

Residents' impressions of the effects of being next to a proposed or existing (i.e., operational) solid waste treatment facility, such as a landfill or incinerator, have been the subject of previous studies. There are several common motifs that appear in the literature on planned or current waste treatment facility sites, despite the possibility that locals' perceptions and attitudes may alter or be moderated after seeing the operation of the facility. These alleged effects include those on social and economic welfare, environmental degradation, public health and well-being. Living close to existing facilities may have negative effects on one's physical health (such as cancer, birth deformities, and respiratory disorders), according to extensive research that has been examined elsewhere (Giusti, 2009 and Vrijheid, 2000). Some members of the public may have concerns

about the potential negative impacts of recycling centers, such as odors, noise pollution, or increased traffic in the vicinity (Ferronato, N., & Torretta, V. 2019).

Odor: One of the most prevalent concerns associated with waste collection facilities is the potential for unpleasant odors. The smell emanating from waste, particularly organic waste, can be a significant source of discomfort for nearby residents. The perception of odors can create a negative image of the facility and raise concerns about air quality and overall hygiene. (Kim et al, 2006)

Noise: Waste collection facilities often involve the operation of heavy machinery, such as garbage trucks or compactors, which can generate noise. The noise can disturb nearby residents and businesses, particularly if the facility operates during late hours or early mornings. The constant noise can be seen as a nuisance and impact the quality of life in the surrounding areas (Gidlöf-Gunnarsson, A., & Öhrström, E. 2010).

Traffic: The presence of waste collection facilities can lead to increased traffic, especially if there is a high volume of waste being transported in and out of the facility. This can cause congestion on nearby roads and create concerns regarding safety, accessibility, and increased travel times for local residents. The perception of increased traffic can negatively impact the desirability of an area

Aesthetics: Waste collection facilities, particularly those that involve visible containers or storage areas, may be perceived as unattractive or unsightly. The presence of large bins or dumpsters in public spaces can detract from the visual appeal of an area and give the impression of a neglected or dirty environment. This perception can lead to concerns about property values and the overall attractiveness of a neighbourhood (Artuso, A., & Cossu, E. 2020).

Health and Safety: Some individuals may have concerns about potential health risks associated with waste collection facilities. These concerns may be related to the handling and storage of hazardous materials, the potential for accidents or spills, or the presence of pests and vermin attracted to waste. Fear of health and safety risks can generate strong opposition to the establishment of waste collection facilities near residential areas (Giusti, 2009 and Vrijheid, 2000).

These concerns can lead to opposition and resistance from local communities. There is a lack of awareness and understanding among the general public about the benefits of recycling centers. Public awareness and education play a critical role in fostering support for recycling centers (Omran, A et al 2009). However, many individuals may have limited knowledge or misconceptions about the benefits of recycling centers.

Visual appeal of Cityscape

The visual disturbance caused by waste collection facilities in historical urban areas is a significant concern. These areas are often characterized by their architectural and cultural heritage, and the presence of unsightly waste collection facilities can detract from their visual appeal and historical value. The visual disturbance can arise from various factors, including the design and appearance of the facility, the visibility of waste containers or bins, and the overall cleanliness and maintenance of the area. In a study by (Karamouz et al, 2019), the visual impact of waste management facilities in historical urban areas is examined. The research focuses on the city of Isfahan in Iran, which is known for its rich historical and architectural heritage. The study investigates the visual perception of waste collection facilities by residents and tourists and explores the factors that contribute to visual disturbance. The findings highlight the negative impact of unsightly waste facilities on the overall aesthetic quality of the historical urban area and the importance of integrating waste management practices that are sensitive to the historical context. In cities that heavily rely on tourism like Malaysia, the visual appeal of the urban environment is critical for attracting visitors. Waste collection facilities that are visually intrusive or located in prominent areas can negatively impact the city's image and deter tourists. This concern becomes more significant. Base on (Artuso, A., & Cossu, E. 2020) the presence of these facilities can be seen as undesirable, potentially leading to a negative perception of the neighborhood or surrounding properties. Concerns about property devaluation may also arise due to the proximity of waste collection facilities.

User Needs and experience

In order to increase resource recovery from solid waste, better sorting of household waste is needed. The study suggest for housing companies to rethink the sorting system they offer to their tenants (i.e. accessible space for electronic waste, more space for biodegradable waste, possibility of sorting textiles, etc.). Opportunity to provide sorting infrastructure that is designed for the user, rather than just fitted to the waste management system. Waste managing infrastructure in recycling center should be design based on user needs, such as accessible space, more space for different waste types which is tailored to the community needs. (Ordoñez, I., Harder, R., Nikitas, A., & Rahe, U. 2015).

Positive user experiences play a crucial role in promoting responsible waste disposal. User-centric design approaches, including intuitive signage, clear instructions, and visual cues, help users correctly sort and dispose of waste (Verdonk, S et al, 2017). Engaging and educating users through interactive displays or informational graphics can foster behavioral change. The findings of the study suggest that signage alone may have a limited effect on waste disposal behavior compared to the influence of modeling behavior. However, the study emphasizes the importance of combining different types of signage to create a comprehensive approach that addresses both descriptive norms and environmental messages.

Integrating informational displays or graphics near waste collection facilities can provide educational content about waste management, recycling processes, and the environmental impact of different waste streams. These displays can engage users and promote awareness and knowledge about sustainable waste management practices.

Furthermore, technology is frequently linked to the interaction of things. Brignull and Rogers looked at the usage of “digital display” as a method of public engagement quoted in (Rauterberg, Menozzi, & Wesson, 2003). They specifically tested how individuals move and engage with public displays. They discovered that transitions between various activity zones and the requirement for motivation cause hold-ups in social interaction. Their perception of the exhibit and what it offers must draw them in so they can pass the threshold into concentrated awareness. According to them, huge displays for public engagement will soon be possible because to the quick development of touch-screen technology and gadgets (Rauterberg, Menozzi, & Wesson, 2003).

Aesthetics and Visual Integration

Design approaches that prioritize aesthetics to minimize the visual impact of waste collection facilities, designing waste collection facilities with a focus on aesthetics goes beyond simply addressing functionality. By prioritizing aesthetics, designers aim to create visually appealing structures that blend seamlessly into the surrounding environment, reducing the visual impact typically associated with waste infrastructure. Several design strategies can be employed to achieve this goal.

Color schemes play a crucial role in minimizing the visual impact of waste collection facilities (Leeabai, N et al, 2021). Opting for neutral or earthy tones, such as grays, browns, or greens, can help the facilities blend with the natural and built surroundings. These colors create a sense of visual continuity, allowing the waste infrastructure to become less conspicuous and more integrated within the urban landscape. Additionally, by analyzing the predominant colors in the area, designers can select complementary or analogous hues that harmonize with the existing palette. This approach helps to minimize visual contrast, allowing the facilities to visually merge with their surroundings.

Architectural form and design can also contribute to visual integration (Abou Ouf, T., & Makram, A., 2018). Designers can explore innovative approaches that mimic or reference the architectural styles prevalent in the surrounding area. For instance, waste collection facilities located in historic neighborhoods might adopt architectural elements that mirror the traditional building styles, such as using specific roof shapes or incorporating decorative elements. By incorporating similar architectural cues, the waste facilities can harmonize with the existing architectural context, enhancing visual integration.

Material selection is another crucial aspect of designing aesthetically pleasing waste collection facilities. Choosing materials that resonate with the surrounding built environment can help create a seamless transition (Wastiels, L., & Wouters, I. 2008). For instance, if the area predominantly features brick buildings, using brick or brick-like materials for the waste infrastructure can create a sense of visual cohesion. Similarly, selecting materials that match the texture and finishes of nearby structures can further enhance the integration of waste collection facilities.

Architectural elements can be utilized to create a visual connection between waste facilities and their surroundings (Leeabai, N et al, 2021). For example, the design of waste collection buildings can mirror the rooflines, fenestration patterns, or other architectural features of nearby structures. This approach allows the waste facilities to blend in seamlessly, giving the impression that they are a natural extension of the urban fabric rather than stand-alone structures.

METHOD

The study employed a quantitative approach, utilizing a questionnaire survey to collect data. This data collection method is crucial for determining data averages and relationships within the general public. The survey's objective is to comprehend the challenges recycling facilities face in Malaysia, their integration into urban spaces, societal preferences regarding spatial design, and the acceptance of industrial facilities within the urban fabric and public realm. The research results presented in this paper are based on survey data from precisely one hundred (100) randomly selected respondents, focusing on residents in residential neighborhoods and the general public in public areas. The survey was conducted using an online Google form, distributed through links and QR codes on relevant social media platforms, selected neighborhood community portals, web pages, and Whatsapp community chat groups.

RESULT AND DISCUSSION

Challenges of waste collection facility and its barriers acceptance into the public realm of cities.

When asked their views on barriers towards integrating Waste Collection Facilities into public spaces, the dominant barrier, as indicated by (49%) of respondents, is the low level of public awareness in relation to recycling rates and public waste disposal practices. This lack of awareness poses a challenge as it may result in reduced public demand and support for waste collection facilities in public spaces. The second most significant barrier, mentioned by (26%) of respondents, is the lack of funding for establishing and maintaining waste collection facilities in the urban fabric. Adequate financial resources are essential to invest in infrastructure, technology, and personnel required to make these facilities operational and efficient. Another notable barrier identified by (22%) of respondents is the concern over the lack of available space within dense cities to accommodate waste collection facilities. Urban areas often face space constraints due to high population density and limited land availability. Lastly, (10%) of respondents expressed concerns about the potential environmental and health hazards associated with waste collection facilities in public spaces.

key design strategies to integrate waste collection facility in the design of public space in urban environment

Findings from the literature review, Survey questionnaires' had determined the perception and preference factor of the general public of urban environment. These findings help to formulate recommended design strategies for recycling centers

Below are design factors for integrating waste collection facilities as public space in Malaysia:

Table 1: Respondents preference factor in formulating Malaysia future waste collection facilities integrated into public realm

Design factors in formulating Malaysia future waste collection facilities.	5 likert-scale (1-5)					Mean	Degree Of importance
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)		
Design factor 01: Recycling center's associates other function & activities for communal use	0	0	6	30	64	4.6	Very Important
Design factor 02: Design is factoring spatial system.	0	2	2	41	55	4.5	Very Important
Design factor 03: Designed factoring location & visibility	1	0	4	30	65	4.6	Very Important
Design factor 04: Design factoring with environmental qualities such as its aesthetic & materiality.	0	4	8	30	58	4.4	Important
Design factor 05: Design factors layout and flow which links with public space.	0	1	7	23	69	4.6	Very Important
Design factor 06: Design factors accessibility	0	0	4	28	68	4.6	Very Important
Design factor 07: Design factors users needs	0	2	8	23	67	4.5	Very Important
Design factor 08: Design factors safety & Cleanliness	0	1	4	29	66	4.6	Very Important

Recommended Design Strategies for Designing Future Waste Collection Facility as Public Space of Urban Environment

Findings from the literature review, Survey questionnaires' had determined the perception and preference factor of the general public of urban environment. These findings help to formulate recommended design strategies for recycling centers. Below table present the propose design strategies for designing future waste collection facility as public space of urban environment.

Table 2: Recommended design strategies

Engagement with public and social activities	
Design Factor	Proposed Strategies
Function & Activities for communal use	Strategy 01: Create Recycling Centers with Multi-functional Spaces and Educational Activities To accommodate multi-functional spaces for various activities, such as labs, marketplaces, exhibition spaces, and educational rooms. Integrating educational activities within recycling centers, such as interactive recycling programs for children, fosters recycling awareness and encourages responsible waste disposal practices. Strategy 02: Incorporate Community Gardens and Urban Farming To allocating space for vegetable gardens, fruit trees, and herb beds, recycling centers provide opportunities for local residents to actively participate in sustainable practices. Strategy 03: Use Informational Displays and Graphics for Waste Management Education To incorporating informational displays or graphics near waste collection facilities can provide educational content about waste management, recycling processes, and the environmental impact of different waste streams.
Spatial System	Strategy 01: Optimize Space Allocation Compact Footprint: Design waste facilities with a compact footprint, making the most of the available space without compromising their functionality. Compact designs free up valuable land for other uses or open green areas, contributing to a more sustainable and enjoyable public realm. Vertical Integration: In areas with limited horizontal space, consider vertical integration by using multi-story designs or underground waste collection systems. Vertical solutions can accommodate various waste streams efficiently while minimizing the facility's ground-level impact. Strategy 02: Zoning and Segregation Zoning for Waste Types: Clearly define separate zones for different waste types, such as recyclables, general waste, organic waste, and hazardous materials. Zoning enables users to easily identify the correct disposal area and facilitates waste sorting at the source. Efficient Flow: Organize the spatial layout to ensure a smooth flow of waste collection activities. Consider logical pathways and minimize bottlenecks or congestion to optimize the movement of waste collection vehicles and users. User Convenience: Place waste collection points strategically, considering user convenience and accessibility. Locate bins or containers in areas where waste is frequently generated, such as near residential buildings, parks, or commercial spaces. Service Access: Design waste collection facilities to provide easy access for waste collection vehicles. Ensure that the entry and exit points are well-planned to avoid
Integration into Urban Environment	
Environmental Qualities, Aesthetic & Materiality.	Strategy 01: Integrate Green Infrastructure Elements for Sustainability To incorporating green infrastructure elements, such as vegetation, green roofs, or living walls, enhances the environmental sustainability of waste collection facilities. Green features promote improved air quality, thermal regulation, biodiversity, and ecological balance, benefiting both the environment and the community. Strategy 02: Use Neutral or Earthy Color Schemes To choose color schemes that complement the natural and built surroundings of the waste collection facilities. Neutral or earthy tones such as grays, browns, and greens can help the structures blend harmoniously with the environment, reducing their visual prominence. Strategy 03: Incorporate Architectural Elements Mimicking Surrounding Styles To incorporate architectural elements that mirror the prevalent styles in the surrounding area. This approach allows the facilities to visually harmonize with the neighborhood and appear as a natural extension of the existing urban fabric. Strategy 04: Select Materials that Match the Surrounding Built Environment To use materials that resonate with the nearby buildings and urban context. Utilizing materials like brick or brick-like textures, which are in line with the predominant architectural elements, can enhance the visual cohesion of the waste infrastructure. Strategy 05: Use Architectural Elements to Connect Facilities with Surroundings To establish a visual connection between the waste facilities and their surroundings. This can be achieved by aligning rooflines, fenestration patterns, or other architectural features with nearby structures, creating a sense of visual continuity.

Engagement with public and social activities	
Design Factor	Proposed Strategies
People Relationship with Waste	
Layout & Flow	Strategy 01: Consider Urban Context and Sustainable Practices To developing the layout and spatial organization of waste collection facilities, it is crucial to take into account the broader urban context and adopt sustainable practices. Understanding the specific needs and characteristics of the city or neighborhood where the facility will be situated helps in creating a design that seamlessly integrates with its surroundings. Strategy 02: Address Functional and Spatial Problems To designing waste collection and segregation sites in urban areas requires careful consideration of functional and spatial issues. An analysis of the site's functional requirements, waste flow patterns, and user needs should inform the facility's layout and spatial organization. Strategy 03: Evaluate Sociospatial Relationships for Recycling Practices To understanding the sociospatial relationships in waste management practices, particularly recycling, is essential in designing effective waste collection facilities. Social norms, cultural influences, and individual behaviors play a significant role in shaping recycling practices within a community.
Accessibility	Strategy 01: Prioritize Universal Design Principles Universal design principles ensure that waste collection facilities are accessible and user-friendly for people with diverse abilities. By considering the needs of users with physical limitations, visual impairments, or other disabilities, designers create inclusive spaces where everyone can easily participate in proper waste disposal practices. Strategy 02: Consider Ergonomic Factors for Waste Bin Placement and Design Ergonomic considerations improve user experience and usability. Waste bins should be positioned at appropriate heights and designed with openings that accommodate different types of waste, facilitating easy disposal. User-friendly interfaces, such as simple and intuitive controls, enhance usability for a wide range of users. Strategy 03: Use Clear and Inclusive Signage and Wayfinding Clear and inclusive signage and wayfinding are crucial components of waste collection facilities to ensure accessibility for all users. Effective signage guides individuals towards waste collection points, provides instructions for proper waste disposal, and indicates recycling or composting options. Multilingual signage enhances accessibility in culturally diverse areas. Strategy 04: Incorporate Technology for Interactive Public Engagement The integration of technology, such as digital displays or interactive interfaces, can enhance public engagement with waste collection facilities. Interactive displays can provide educational content about waste management, recycling processes, and the environmental impact of different waste streams.
User Needs	Strategy 01: Implement Sorting Infrastructure Tailored to Community Needs Waste collection facilities should be designed based on user needs, considering factors such as accessible space, space for different waste types, and tailored solutions for the community. Strategy 02: Use User-Centric Design with Intuitive Signage and Visual Cues User-centric design approaches, including intuitive signage and visual cues, help users correctly sort and dispose of waste. Engaging and educating users through interactive displays or informational graphics can foster behavioral change and encourage responsible waste disposal practices. Strategy 03: Employ Interactive Displays and Graphics for Behavioral Change Interactive displays and graphics can be employed to educate users about waste management and recycling practices, encouraging behavioral change towards more sustainable waste disposal behaviors.
Safety & Cleanliness	Strategy 01: Adequate Lighting To Enhances visibility and safety at waste disposal areas, integrating them into the urban fabric. Adds to urban aesthetics with thoughtful lighting design that complements the surroundings. Encourages nighttime activities, fostering a vibrant urban atmosphere. Strategy 02: Hygiene Facilities Promotes user comfort and convenience, encouraging responsible waste disposal. Minimizes odors and litter, maintaining a cleaner urban environment. Demonstrates compliance with health and safety standards, reflecting responsible waste management. Enhances public perception by conveying a commitment to cleanliness and sustainability.

CONCLUSION

The study had address the main research question of ‘What are the key design strategies to integrate waste collection facilities in the design of public space to seamlessly blend waste infrastructure into the Urban environment, which can be included into the future development of urban waste facilities, by investigating sustainable recycling center and urban strategies literature. One of the objectives of the research is to develop key design strategies to integrate waste management facility in the design of public space in urban environment. These strategies are proposed in a table under chapter 5.2 which can be applied into recycling center in the public realm of cities. The findings that identified the related design strategies, which was derived from the survey questionnaire have achieve the research objective.

Another objective of this research is to examine the barrier of existing waste collection facility integration in public realm of urban environment. The dominant barrier, as indicated is the low level of public awareness in relation to recycling rates and public waste disposal practices. This lack of awareness poses a challenge as it may result in reduced public demand and support for waste collection facilities in public spaces. The second most significant barrier, mentioned is the lack of funding for establishing and maintaining waste collection facilities in the urban fabric. Adequate financial resources are essential to invest in infrastructure, technology, and personnel required to make these facilities operational and efficient. Another notable barrier identified is the concern over the lack of available space within dense cities to accommodate waste collection facilities. Urban areas often face space constraints due to high population density and limited land availability. Further concerns about the potential environmental and health hazards associated with waste collection facilities in public spaces. These concerns may stem from issues such as odors, pollution, or improper waste handling. Nearly half of the responded preferred to practice recycling within their own home or neighborhood, this highlights the convenience and comfort associated with home-based recycling practices of the respondent instead of going to a centralize recycling center

Further research and collaboration with policymakers and relevant stakeholders can complement these findings and lead to holistic waste management solutions that incorporate both design and policy aspects. Such efforts can ultimately enhance the sustainability, cleanliness, and efficiency of waste management practices in urban cities, creating healthier and more environmentally friendly living spaces for communities.

ACKNOWLEDGEMENT

I would like to extend my sincere gratitude to everyone who helped with the research for this study by offering helpful advice and resources.

First and foremost, I would like to express my sincere gratitude to my research supervisor, Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd Noor, for providing the opportunity and assistance. His invaluable assistance, supervision, perceptive remarks, and suggestions throughout this research have provided a whole fresh viewpoint, vision, and motivation. With direction and constant assistance, this study was able to be performed more successfully. For their input and help during the study, I am also grateful to the faculty office at the Faculty of Design and Architecture at Universiti Putra Malaysia. Last but not least, I want to express my sincere gratitude to my parents for their unfailing support and affection during this study project.

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OYSTERS FOR A SUSTAINABLE MUAR: DESIGNING URBAN AQUACULTURE THROUGH NATURE-BASED SOLUTIONS

Tan Xuan Xiang, Dr. Zalina Shari,

ABSTRACT

Muar oysters were already well-known in the history of Muar as they have been recorded in various writings since 1858. The oysters found in the Muar River Mouth are believed to be among the highest quality in the world. Recently, due to uncontrolled coastal urban spatial development and environmental factors, the ecosystem has been unstable, and the oyster population and market export rates are low. The authority's guidelines to address this issue, particularly on architectural adaptation for oyster aquaculture, are almost non-existent. Therefore, the research aims to formulate an oyster urban aquaculture framework integrating Nature-Based Solutions (NBS) for inclusive and sustainable coastal urban spatial development in Muar. In this research, case studies and in-depth interviews with experts and stakeholders were used as the research inquiry to identify and formulate sustainable solutions for oyster aquaculture in Muar. The findings revealed that the importance of NBS and the stacking farm system in improving the sustainability, productivity, and environmental resilience of oyster farming. By embracing nature's collaboration and integrating green infrastructure, recreational spaces, and communal areas, oyster farming spaces can be transformed into vibrant and engaging environments that enhance the value of the surrounding ecosystem. These insights pave the way for more sustainable and impactful oyster farming practices. The findings contribute to innovative architectural approaches suitable for oyster aquaculture in the specific urban context towards enhancing communities' socio-economic and conservation awareness. It is recommended for a future qualitative study be conducted to look at innovative urban aquaculture technologies exclusive for oyster population restoration and add more variables to the existing study, with other potential architectural innovations and typologies.

Keywords: Muar oysters; architectural adaptation, oyster aquaculture; nature-based solutions; socio-economic impact.

INTRODUCTION

Aquaculture plays a critical role in addressing global food security and ensuring a sustainable supply of seafood. It involves controlled farming of aquatic organisms like fish, shellfish, and plants, using innovative techniques and technologies. Aquaculture not only provides nutritious food for a growing population but also helps protect the environment by reducing pressure on wild fish stocks and preventing overfishing. To meet the increasing demand for seafood while preserving marine ecosystems, it is essential to embrace and further develop aquaculture (Rinkesh, 2022).

Urban aquaculture offers a transformative solution to the challenges of food production and resource utilization in cities. By bringing aquaculture into urban areas, it allows for controlled and sustainable cultivation of aquatic organisms. This proximity to cities brings benefits such as shorter supply chains and improved access to fresh and nutritious seafood for urban populations. Urban aquaculture also presents opportunities for efficient use of limited space and integration of innovative technologies to optimize resource utilization. Embracing urban aquaculture promotes food security, local economic development, and sustainable growth in urban environments (FLAHjss, 2023).

Sustainable urban aquaculture aims to minimize negative environmental impacts while maximizing social and economic benefits. It involves incorporating environmentally friendly practices, efficient resource utilization, and considering social and economic factors for long-term viability and resilience (FLAHjss, 2023).

Coastal zones, despite covering less than 15% of the Earth's land surface, support over 60% of the global population. The population residing within 100 km of the coast has been increasing, and it is predicted to double in the next 30 years, with an estimated 75% of the global population residing in coastal areas by 2025. The growth in human population along coastlines has led to habitat conversion, pollution, and higher demand for coastal resources, putting increased pressure on coastal ecosystems (Airoidi & Beck, 2007).

In Muar, rapid urban development has resulted in significant environmental consequences. Muar has become the third most developed district in Johor, with a large area dedicated to residential purposes. However, this extensive urbanization has led to a decline in water quality, directly affecting oyster farming in urban areas. It is crucial to implement sustainable practices and interventions to mitigate the environmental impact caused by urban development and ensure the preservation of water quality (Department of Irrigation and Drainage, 2011).

Table 1: The total Projected Residential Landuse in Johor districts (including Muar) between 2001 and 2020.

District	2001-2005	2006-2010	2011-2015	2016-2020	Total 2001-2020	Percentage of Total Increase (%)
Johor Bahru	5,957	9,792	11,926	14,316	41,991	59.93
Batu Pahat	1,024	1,796	1,928	2,054	6,802	9.71
Muar	927	1,645	1,732	1,823	6,127	8.74
Kluang	807	1,409	1,516	1,634	5,366	7.66
Kota Tinggi	514	916	963	999	3,392	4.84
Segamat	406	749	765	762	2,682	3.83
Pontian	406	701	740	785	2,632	3.76
Mersing	163	297	303	316	1,079	1.54
Total	10,204	17,305	19,873	22,689	70,071	100 %

*Note: Does not include the Ledang and Kulajaya Districts

(Source: Department of Irrigation and Drainage, 2011)

The integrity of coastal ecosystems has been compromised by unchecked urban expansion along coastlines, leading to a decline in the productivity and quality of oyster cultivation. This issue is not confined to a particular region in Malaysia but is pervasive across various oyster farming areas. Factors like sedimentation, fluctuating salinity levels in rivers, and the repercussions of coastal development and fishing activities are contributing to this problem (Airoidi & Beck, 2007).

To foster sustainable oyster farming practices, the application of nature-based solutions (NBS) emerges as a promising strategy. NBS involves harnessing natural processes and ecosystems to address environmental challenges. Within the context of oyster farming, NBS encompasses endeavors like habitat rehabilitation, managing water quality, and employing ecological engineering techniques. These approaches yield multiple advantages, including fostering sustainable production, enhancing water quality, bolstering biodiversity, and offering valuable ecosystem benefits (Climate-ADAPT, 2020; Engle & Senten, 2022).

Realizing sustainable urban aquaculture, including oyster farming, necessitates the embracing of sustainable methodologies, mitigation of environmental impacts, and the active incorporation of nature-based solutions. This holistic approach aims to harmonize urban development imperatives, safeguard coastal ecosystems, and ensure the well-being of local communities (NOAA Fisheries, 2022).

The dwindling oyster production and quality in Muar predominantly stems from the instability within coastal ecosystems due to sedimentation and the unpredictable ebb and flow of salinity levels in the river. These issues have arisen as a consequence of unregulated urban growth along the coast. Oyster cultivators have incurred substantial losses, impacting their livelihoods as well as the local ecological equilibrium. While architectural adaptations hold significance in bolstering ecosystem services, there is an absence of comprehensive strategies specifically tailored to address the distinctive challenges confronting urban oyster aquaculture in Muar (Mohame, 2022).

Previous studies have proposed solutions for similar issues in oyster farming, such as the use of Recirculating Aquaculture Systems (RAS). However, RAS is not sustainable due to its high energy consumption. Limited research has been conducted to explore sustainable adaptation approaches specifically for urban oyster aquaculture (Fletcher, 2022).

Nature-based solutions (NBS) have been identified as effective strategies for restoring ecosystems and enhancing ecosystem services. Examples include using natural materials to create oyster reefs and restoring habitats to support oyster populations. By working in harmony with nature, architectural design can take inspiration from natural shapes, materials, structures, and mechanisms (Fikriarini & Ishomuddin, 2016). Integrated multitrophic aquaculture (IMTA), which involves cultivating multiple species together to create a balanced ecosystem, is another sustainable farming approach (Ahmed & Glaser, 2016; Ahmed et al., 2017). However, the application of NBS and architectural precedents in urban oyster aquaculture, particularly in the Muar region, remains largely unexplored. Therefore, there is a knowledge gap regarding the suitability and effectiveness of NBS approaches in addressing the specific challenges of oyster farming in Muar (Fletcher, 2022).

The research aims to develop an architectural design framework for sustainable urban oyster aquaculture integrated with nature-based solutions (NBS). This study will investigate the feasibility and effectiveness of NBS approaches in addressing the challenges faced by oyster farming in Muar, ultimately contributing to the development of innovative architectural strategies for inclusive and sustainable urban oyster aquaculture in the specific urban context of Muar.

The degradation of oyster production and quality in Muar is primarily attributed to the instability of the coastal ecological systems, including siltation and unstable salinity range in the river, caused by uncontrolled coastal urban spatial development (Mohame, 2022). This has led to significant losses for oyster farmers, impacting their livelihoods and the local ecosystem. Despite the importance of architectural adaptation strategies to strengthen the local ecosystem services, there is a lack of comprehensive approaches specifically tailored to address the challenges urban oyster aquaculture faces in Muar. Previous studies have attempted to address similar problems in local and overseas oyster farming. Some proposed solutions include the implementation of Recirculating Aquaculture Systems (RAS) as an adaptation measure. However, the high energy consumption makes it unsustainable and limited research has focused on exploring sustainable adaptation approaches in the context of urban oyster aquaculture (Fletcher, 2022).

NBS has been recognised as an effective strategy for ecosystem restoration and enhancement of ecosystem services, such as using natural materials to create oyster reefs and restoring natural habitats to support oyster populations. By collaborating with nature, the shapes, materials, structures, and mechanisms found in the natural world can serve as the foundation for architectural design (Fikriarini & Ishomuddin, 2016). Various sustainable farming approaches, such as integrated multitrophic aquaculture (IMTA), involve cultivating multiple species to create a more balanced ecosystem (Ahmed & Glaser, 2016; Ahmed et al., 2017). The application in urban oyster aquaculture, including architectural precedents in the Muar region, remains largely unexplored. Therefore, there is a gap in knowledge regarding the suitability and effectiveness of NBS approaches in addressing the specific challenges of oyster farming in the Muar context.

This study has two main research objectives. The first objective is to assess the potential environmental effects of development on the oyster population in Muar. The second objective is to explore suitable architectural adaptations for nature-based oyster farming within the urban oyster aquaculture setting in Muar. The findings of this study contribute to innovative architectural approaches for sustainable and inclusive oyster aquaculture in Muar's urban setting. The goal is to enhance socio-economic conditions and raise awareness about conservation among communities. The developed framework, which integrates nature-based solutions into architectural design interventions, can benefit Local Authorities in their future city planning and development efforts, thereby boosting the local socio-economy.

The qualitative research approach was adopted to answer the research questions. Case studies and in-depth interviews with experts and stakeholders were used as the research inquiry to identify and formulate sustainable solutions for oyster aquaculture in Muar.

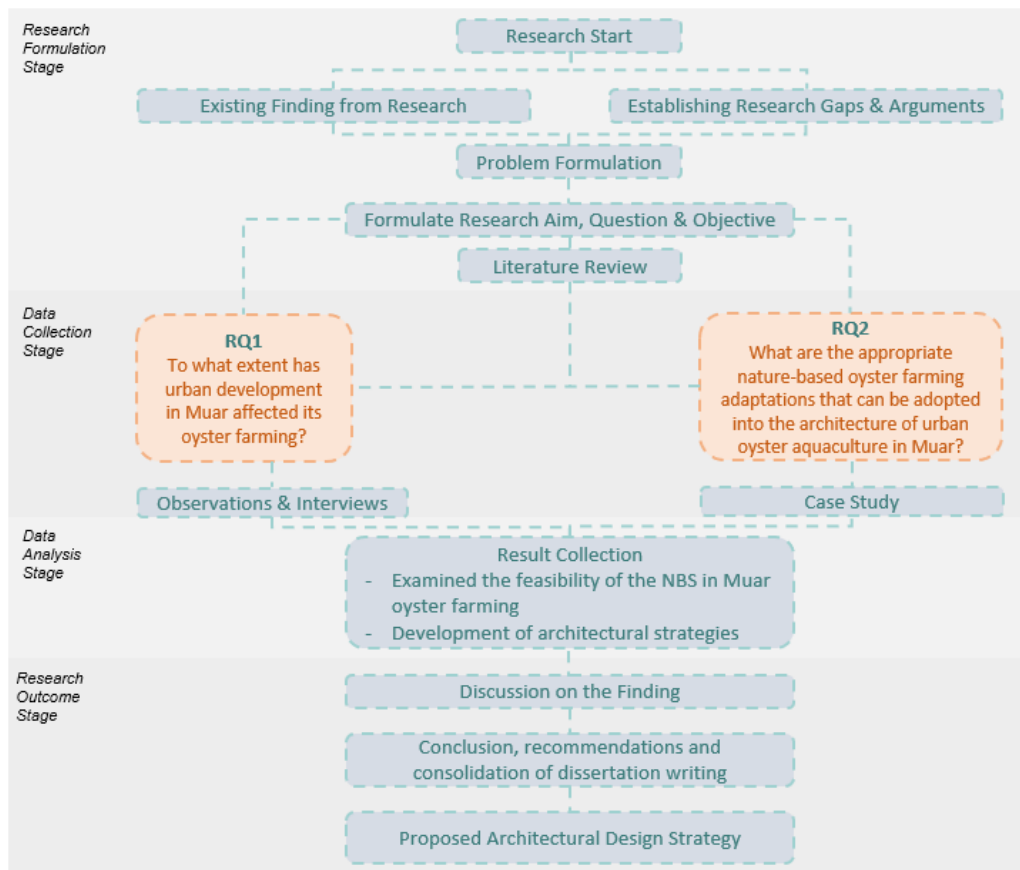


Figure 1: Research Design Framework. (Source: Author, 2023)

METHOD

The research approach for this study involves a combination of qualitative methods, including interviews, field observations, and desk review of secondary data. These methods are employed to gather comprehensive and in-depth information to address the research objectives. The three methods are: (1) Interviews (2) Field Observations (3) Desk Review (Secondary Data)

The research methodology is shown in Table 3.1 to investigate the study's research questions.

Table 2: Research questions and Research methodology.

Research Question (RQ)	Data Sources
RQ1: To what extent has urban development in Muar affected its oyster farming?	In-depth interview and Observation
RQ2: What are the appropriate nature-based oyster farming adaptations that can be adopted into the architecture of urban oyster aquaculture in Muar?	Desk review analysis

(Source: Author, 2023)

To begin with, this study initiates comprehensive in-depth interviews involving key stakeholders, such as oyster farmers, domain experts, and relevant individuals. Patten (2018) highlights interviews as valuable tools for grasping intricate subjective viewpoints that arise from natural setting observations. These interviews yield valuable insights into their perceptions, experiences, and knowledge surrounding urban oyster aquaculture and its associated challenges. For instance, Informant 1 underscores that oyster farms necessitate a natural water source for nourishment, yet remain susceptible to fluctuations in water quality.

Subsequently, field observations are conducted during on-site visits, aligned with the interview sessions. Miles and Huberman (1994) emphasize the significance of observation as a fundamental element throughout structured or unstructured data collection procedures. Field observations aim to directly witness and document the physical elements of urban oyster farms, encompassing infrastructure, farming methodologies, and environmental conditions. These observations offer direct insight into the operational intricacies and obstacles faced by oyster farmers.

For a comprehensive and nuanced dataset, a combination of in-depth interviews and field observations unfolds at the oyster farm in Parit Tiram Muar. This dual approach aims to scrutinize the ramifications of urban development on oyster cultivation in Muar. The research engages with oyster farmers, field experts, and pertinent stakeholders. The interviews and observations deliver insights into the specific dilemmas and challenges encountered by oyster farmers amid Muar's urban evolution. The researcher personally undertakes both interviews and observations, meticulously recording findings through note-taking and photographing the farm using a mobile phone. To ensure richer qualitative data, local oyster divers are interviewed during the observation process. The interview sessions are audio-recorded, with subsequent transcription work translating participants' statements from colloquial language to English. Following this, a qualitative analysis is executed to dissect and interpret the accumulated information. This study involves five oyster divers from Parit Tiram Muar and an expert affiliated with I-AQUAS.

A thorough desk review is conducted to gather and analyze existing secondary data from relevant sources such as research articles, reports, and policies, which supported the interpretation of the data collected. As Raban and Walter (2016) noted, "secondary data analysis often provides a useful and efficient way to gather additional insights into research questions" (p. 52). Case study research use to identify and formulate sustainable solutions for oyster aquaculture in Muar. Cases were chosen based on geographical location and relevance to the Muar context. Comparative analysis was performed to examine the effectiveness and suitability of different nature-based oyster farming adaptations. The analysis considered architectural design elements, ecological impact, and socio-economic aspects.

The collected data is analysed by using Thematic Analysis Matrix (TAM). In this stage, the analysis will include strategy of inquiry, coding data, developing category, labeling theme and looking for emergent pattern in the data.

Table 3: Thematic Analysis Matrix (TAM).

Main RQ: How can the architecture of urban oyster aquaculture integrated with nature-based solutions be designed to address the challenges posed by the inevitable development in Muar? Aim of research: The research aims to develop an architectural design framework for sustainable urban oyster aquaculture integrated with nature-based solutions (NBS).			
Sub Research Questions	Deductive	Inductive codes	
		Coding	Final theme
Sub RQ 1: To what extent has urban development in Muar affected its oyster farming?	DC1: Environmental Impact on Oyster	Environmental Impact Quality of Water Oyster Living Criteria Unpredictable Yield Market Opportunities Improvement in Farming Techniques	Frustrated in yield due to the condition of river water Theme 1: Challenges
		Approach Harvest Method Effectiveness Life Cycle Management Spatial Configuration Stacking Shellfish Aquaculture System	The relation of current harvest method with the farm management Theme 2: Culture
Sub RQ 2: What is the appropriate nature-based oyster farming adaptations that can be adopted into the architecture of urban oyster aquaculture in Muar?	DC3: Architecture Adaptation in Oyster Farming Through Nature-Based Solutions	Nature-Based Solutions Sustainability Value Affordability	Sustainable design can affect socio-economic. Theme 3: Design

(Source: Author, 2023)

RESULT AND DICUSSION

The study employs a thematic analysis approach to identify the codes and themes related to NBS architecture adaptation and its potential application in urban oyster aquaculture. The transcriptions of the interviews and case studies are analysed as supportive data, and a thematic analysis matrix is utilized to organize the identified codes and develop themes from them. As a result, the study identifies three distinct inductive codes, namely 'Environmental Impact', 'Approach' and 'Nature-based Solutions' then the main themes will emerged based on the codes.

Based on the first codes 'Environmental Impact'. The data collected from interviewees highlights several environmental factors that contribute to the decrease in oyster population in Muar. Anthropogenic activities, such as increased sedimentation and excess fresh water input, have resulted in negative impacts on water quality. Heavy rain events exacerbate the situation by flushing rainwater into the river, affecting salinity levels and causing sedimentation on oyster beds. Water pollution from industrial activities, agricultural runoff, and urban development is another significant concern, directly harming oysters and disrupting their food sources. The peril of habitat destruction, encompassing coastal development and the alteration of wetlands and estuaries, emerges as a significant menace to oyster populations. These revelations underscore the necessity of confronting these ecological challenges to secure the endurance and viability of oyster farming in Muar.

Moreover, the insights garnered from interviewees illuminate pivotal benchmarks for optimal oyster habitation. Safeguarding against pollution sources stands paramount, requiring oyster farming zones to distance themselves from industrial emissions, sewage discharges, and agricultural effluents, thus minimizing the specter of contamination. Clean, high-caliber water emerges as an indispensable requirement for oysters, mandating adequate levels of dissolved oxygen, balanced salinity, and minimal pollutants. Essential nutrient availability also warrants attention, as oysters necessitate ample sustenance for their survival. Climatic conditions, including temperature variances and salinity tiers, significantly influence oyster well-being and survival. Additionally, oysters lean on suitable substrates, such as pristine, sturdy surfaces like shell fragments or purpose-designed oyster beds, to secure attachment and growth. The provision of suitable habitats, such as sheltered estuaries or bays, holds pivotal sway over the triumph of oyster farming. These benchmarks illuminate the imperative of encompassing water quality, nutrient access, weather dynamics, and fitting habitats in the quest to engineer ideal conditions for oyster cultivation.

The narrative also spotlights the enigma of unpredictable yields in oyster farming. Variables such as capricious breeding seasons and fluctuations in harvest caliber can sway the productivity of oyster farms. Climate change, with its attendant ramifications like heightened temperatures and shifts in salinity profiles, compounds the uncertainty afflicting oyster cultivation. These shifts in the environment can fuel the prevalence of ailments and parasites afflicting oysters, culminating in outbreaks and gravely impacting oyster growth and survival. Adapting to these mutable environmental conditions often demands significant adjustments from oyster farmers, often constrained by limited financial resources and technological support. The fluxes in salinity driven by climate shifts, primarily spurred by altered precipitation patterns and escalated freshwater discharge, further impact oyster sustenance and survival. All told, the erratic yield in oyster farming takes shape under the influences of diverse environmental factors, encompassing climate shifts and their ripple effect on water dynamics and disease prevalence.

The desire for oysters in Malaysia unfolds as a variable influenced by elements such as seasonal shifts and distinct client orders. Oyster farming introduces market prospects within the local tourism sector, where oyster farms can magnetize visitors eager to partake in the cultivation process, indulge in the pleasure of fresh oysters, and engage in oyster-centered pursuits. This momentum augments tourism revenue and nurtures local identity and cultural heritage. Moreover, Muar has garnered acclaim as a premier supplier of top-tier oysters, captivating tourists who specifically journey to savor this delicacy. In essence, the demand for oysters in Malaysia is projected to burgeon due to stimuli like tourism and a burgeoning populace.

Within this milieu, the data casts a spotlight on varied strategies for enhancing oyster farming in the face of shifting environmental dynamics. Partnerships with experts, scholars, researchers, and governmental entities can channel invaluable insights and resources to fortify adaptive strategies. Sharing wisdom and insights within the industry can engender a collective response to ecological trials. Adaptive management tactics, marked by the meticulous monitoring of environmental

parameters and corresponding adjustments in farming practices, stand as adaptive mechanisms to navigate shifting conditions. Tailoring farming methodologies and infrastructures—like timing the introduction of seedlings, deploying floating oyster enclosures or adjustable frameworks, and enacting protective measures against storms—proves instrumental in navigating environmental shifts. Oyster farmers astutely recognize the significance of vigilantly monitoring environmental conditions and deploying appropriate measures to guarantee the long-term sustainability and triumph of their farms.

For the second codes ‘Approach’. In this part, all of the oyster divers at Muar performed traditional practice, which is diving and collecting oyster at riverbed. All of the informants agreed that the method is unstable in term of safety, income and it’s depend on weather and age of the workers. The data collected from interviews with oyster farmers reveals insights into the harvest methods employed in oyster farming. The traditional method of diving and collecting oysters is commonly used by farmers, as mentioned by informants 2, 3, and 4. This method is cost-effective and requires less time for harvesting. However, it poses challenges during rainy days when farmers cannot go into the water. Informant 3 highlights the difficulty in hiring new people, particularly young individuals who are less interested in pursuing this type of work. Additionally, informant 4 mentions the absence of a proper method for maintaining production, indicating that farmers harvest what they are able to without a structured approach. In contrast, informant 5 describes an alternative method of tying oysters in nets surrounding their restaurant area, providing easy access to oysters. However, informant 6 highlights the potential risks faced by workers due to the uncertainty associated with diving into the water. Overall, the data highlights a range of perspectives and experiences related to harvest methods in oyster farming, including the benefits, challenges, and potential risks involved.

The effectiveness of oyster farming practices is a topic explored through the data collected from the interviews. Informants 2 and 4 mention the lack of a specific method to maintain production, indicating a need for improvement in this area. However, informant 3 notes that they are able to harvest around 100kg of oysters on weekends, and the increase in tourist visits after the announcement of high-quality oysters in Muar has been beneficial for their business. Informant 5 highlights their ability to preserve the freshness of the oysters after collection, suggesting a level of effectiveness in their approach. Informant 6 also mentions the recent success in harvesting more than 100kg of oysters during weekends. Overall, the data reveals a range of experiences regarding the effectiveness of oyster farming practices, with some informants expressing the need for improvements while others demonstrate successful outcomes in terms of production and business opportunities.

The concept of life cycle management in oyster farming is discussed through the data collected from the interviews. Informant 1 mentions the reuse of oyster shells in the industry for spat settlement, indicating a consideration for sustainable practices. Based on the data collected from informants 2, 3, 4, 5, and 6, it is evident that they also follow the practice of throwing oyster shells into the river after peeling off the shell of the oyster, similar to informant 1. This common practice among the informants indicates a prevailing trend in the disposal of oyster shells in the farming process. The data highlights the need for greater awareness and implementation of life cycle management principles in oyster farming practices to ensure long-term environmental sustainability and efficiency.

Drawing from secondary data through desk review, the proposed solution introduces communal spaces, including galleries and classrooms, along with improved coastal access through a waterfront promenade walk. This initiative aims to connect people with nature, aligning with the NBS design principle of resilient and ecologically friendly urban aquaculture systems. By harmonizing with nature, the shapes, materials, structures, and mechanisms inherent in the natural world serve as the foundation for architectural design. As for the aquaculture component, the innovative stacking shellfish aquaculture system optimizes vertical space. This method, employing stacked crates or trays, surmounts limitations of traditional horizontal farming, utilizing land or water surface efficiently. It enhances water circulation, fostering optimal conditions for oyster growth and improved yields. This system’s controlled environment curtails external impacts, enabling efficient monitoring and maintenance, while its flexibility permits expansion without significant infrastructural changes. Overall, the stacking shellfish aquaculture system presents a sustainable and productive solution, elevating oyster farming’s efficiency while reducing its ecological footprint.

Concerning the ‘Nature-based Solutions’ code, insights from data underscore the sustainability facet of oyster farming. Informant 1 underscores the significance of natural water sources for oyster sustenance, acknowledging the challenge posed by shifting water quality. They propose a design based on tidal variations for water intake and outflow, optimizing costs and providing sufficient nourishment for oysters. Informant 3 accentuates the advantages of stacking systems like the Shellfish Tower, enabling efficient oyster population management. They posit that the vertical arrangement simplifies access and monitoring, facilitating timely interventions and optimizing production. Conversely, informant 4 emphasizes oyster quality’s paramountcy to drive consumer demand, stressing rarity and excellence over mere quantity. Informant 5 highlights the ongoing management and maintenance required by nature-based solutions, acknowledging the possible additional costs. Lastly, informant 6 champions stacking techniques’ potential to boost oyster production while advancing sustainability and efficiency. Collectively, these insights encompass aspects from water management to monitoring systems and quality upkeep, contributing to a holistic comprehension of sustainability in oyster farming.

Delving into the perspectives on oyster farming’s benefits and potential outcomes, informant 1 underscores its capacity to elevate farmers’ income, signaling its profitability. Informant 3 champions nature-based solutions’ integration for resilience, productivity, and environmental soundness. They acknowledge its value in nurturing a sustainable and efficient Muar farming system. Informant 5 highlights the imperative of farmer-researcher collaboration, fostering shared expertise, best practices, and technological advancements in Shellfish Tower systems. This unity can refine techniques, surmount challenges, and drive innovation. Informant 6 spotlights the importance of gleaned insights from fellow farmers to make informed choices and proficiently implement architectural adaptations. Collectively, these viewpoints illuminate the potential for augmented income, resilience, sustainability, and innovation within oyster farming.

Furthermore, seamless collaboration among diverse stakeholders proves pivotal in materializing innovative housing designs. The effective adoption of NBS-based oyster farming architecture hinges upon multi-faceted cooperation encompassing oyster farmers, architects, engineers, scientists, and regulatory authorities. By intertwining ecological principles into design and functionality, this approach fosters sustainable, ecologically aligned aquaculture practices, culminating in the conservation and rejuvenation of coastal ecosystems. The synergy among these diverse stakeholders stands paramount in realizing the sought-after outcomes of sustainable oyster farming and ecological enhancement.

This study adopts a thematic analysis method to delve into NBS (Nature-based Solutions) architecture adaptation within urban oyster aquaculture. The initial code, ‘Environmental Impact,’ underscores how human activities, such as sedimentation and water pollution, have adversely impacted Muar’s oyster population. Threats stemming from habitat degradation and coastal development are also discernible. The study accentuates the urgency of addressing these ecological concerns to ensure oyster farming’s sustainability. Moreover, it unearths criteria vital for optimal oyster habitats, encompassing pollution safeguarding, pristine water, apt weather conditions, and suitable havens. The second code, ‘Approach,’ highlights the challenges faced in oyster farming, such as unpredictable yields and the traditional method of diving for oysters. The data suggests the need for improvements in maintaining production and safety. The effectiveness of farming practices varies among informants, with some experiencing successful outcomes. The concept of life cycle management, including the reuse of oyster shells, is discussed as a sustainable practice that requires greater implementation.

The third code, ‘Nature-based Solutions,’ focuses on sustainability in oyster farming. Water management based on tidal changes, stacking systems for monitoring, and maintaining oyster quality are highlighted as important aspects. The study emphasizes the benefits of nature-based solutions and collaboration among stakeholders to promote resilience, productivity, and environmental sustainability in oyster farming.

Lastly, three key frameworks of proposed NBS architectural design planning for sustainable urban oyster aquaculture were introduced. These frameworks offer innovative approaches to revolutionize oyster farming practices, promoting environmental sustainability, and enhancing productivity. The Stacking Farm System introduces a vertical arrangement for oyster cultivation, optimizing

space and providing efficient monitoring. Spatial Configuration emphasizes thoughtful design to support various stages of oyster farming, minimizing environmental impact while maximizing success. Finally, “Build in Nature” embraces NBS principles, transforming oyster farming areas into vibrant and engaging environments, attracting visitors, and promoting ecological awareness. With these frameworks as a guide, we pave the way for a promising future of oyster aquaculture in our urban context.

CONCLUSION

In conclusion, this study provides insights into the environmental impact, approaches, and nature-based solutions in urban oyster aquaculture. It underscores the importance of addressing environmental issues, improving farming practices, and implementing sustainable and innovative techniques for the long-term success of oyster farming. Collaboration among stakeholders is crucial for the adoption of NBS architecture and the promotion of sustainable aquaculture practices.

With its vertical arrangement of trays or bags, the stacking farm system emerges as a space-saving and highly scalable solution for oyster cultivation. This innovative approach optimizes land or water surface usage, facilitates better water flow and circulation, and provides a controlled environment for the shellfish. Integrating the stacking farm system and NBS aligns with the principles of sustainable development, resource conservation, and ecosystem preservation, contributing to the long-term success of oyster farming operations.

Practically, the research findings offer valuable implications for the I-Aquas and other aquaculture stakeholders. I-Aquas can further develop and implement the proposed design principles to advance aquaculture practices in the region. By promoting NBS and the stacking farm system, I-Aquas can support the oyster farming community in improving the sustainability and efficiency of their daily diving activities. This approach fosters environmental stewardship, promotes socio-economic development through tourism opportunities, and ultimately contributes to the conservation and restoration of coastal ecosystems.

While this study has provided valuable contributions to sustainable aquaculture, there are certain limitations to consider. The research focused primarily on oyster farming practices in Muar and further investigations across various geographical areas and aquaculture species would enhance the generalizability of the findings. Additionally, long-term monitoring and economic assessments are needed to ascertain the durability and financial viability of the proposed design solutions. Collaboration with diverse stakeholders and knowledge exchange platforms can further drive innovation and best practices in the industry.

Two main limitations can be identified in this study. First, there is a potential for bias in the findings as the primary data sources are interviews and case studies conducted with oyster farmers. Since these individuals are directly involved in the industry, their perspectives and experiences may be subjective and biased. The study does not discuss any efforts made to mitigate potential bias or incorporate alternative viewpoints, which could have enhanced the objectivity of the findings. Second, the study lacks a clear time frame for data collection. Oyster farming practices and environmental conditions can change over time, and without a specified time frame, the findings may not accurately reflect the current situation. Including a clear time frame would have provided context and allowed for a better understanding of the relevance and applicability of the findings in the present time.

Considering these limitations, it is important to interpret the study’s findings with caution, recognizing the potential bias in the data and acknowledging that the information may not reflect the most up-to-date practices and conditions in oyster farming. Future research should address these limitations by incorporating strategies to mitigate bias, including a broader range of perspectives, and clearly specifying the time frame of data collection.

This study is recommended for a future qualitative study be conducted to look at innovative urban aquaculture technologies exclusive for oyster population restoration and add more variables to the existing study, with other potential architectural innovations and typologies.

ACKNOWLEDGEMENT

First and foremost, I would like to express my heartfelt appreciation to my supervisor, Assoc. Prof. Dr. Zalina Shari, for her invaluable guidance, encouragement, and support throughout the research process. I am grateful for her insightful comments, constructive feedback, and dedication to ensuring the success of this project.

Besides, I am also grateful to my Dissertation Coordinator, Assoc. Prof. Dr. Mohd. Zairul Mohd. Noor, for his support and assistance throughout my academic journey. His knowledge and expertise have been a tremendous asset to the completion of this dissertation.

Lastly, I would also like to express my sincere appreciation to Dr. Nur Leena Wong Wai Sin and the oyster farmers from Parit Tiram for generously sharing her knowledge and expertise during the interview session. Her willingness to provide valuable information has been invaluable to this study.

Thank you all for your invaluable support and contributions.

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EXPLORATION OF FISHERIES TOURISM AS AN ALTERNATIVE TO DIVERSIFY THE LIVELIHOODS OF THE FISHING IN KAMPUNG KUALA MUDA.

Rehan Hussain, Nor Azlina Abu Bakar,

ABSTRACT

Fishing represents a longstanding cultural practice within the community of Kampung Kuala Muda in Seberang Perai Utara, Pulau Pinang. The activity continues to be passed down from one generation to the next, up until the present day. Simultaneously, the progress of Pulau Pinang is advancing at a rapid pace. The economic development of this fishing community remains significantly lagging. The fishing community continues to experience economic hardship. Despite the provision of multiple forms of government assistance, including allowances, training programs, and oil subsidies, the fishing community continues to experience persistent poverty. Hence, the objective of this study is to investigate the potential of fisheries tourism as a means to diversify the livelihoods of fishing communities. This study aims to administer questionnaires to assess the demand for elements that can enhance fisheries tourism among fishermen and the general public. This study aims to identify the necessary components and factors that contribute to the development of fisheries tourism. This study aims to contribute to the identification of the needs of fishermen and the determination of a model for fisheries tourism as a tourist attraction. Subsequent investigations may incorporate additional variables into the extant study pertaining to the phenomenon, thereby augmenting the intrinsic worth in relation to its appeal as a tourist destination.

Keywords: Fisheries Tourism; Fisherman livelihoods; Fishing Village.

1. INTRODUCTION

Kuala Muda is a fishing village located in Mukim 1, District of North Seberang Perai, Penang. Kuala Muda Village covers an area of 222,000 m², is one of the early settlements along the Sungai Muda River that borders Penang and Kedah. Fishing is a tradition of the Kuala Muda community, which has been in existence since 1900. To this day, the activity continues to be passed down from generation to generation. Fishing activities in Kuala Muda are unique, as fishermen directly sell their catch in the market using a whisper bidding system. The fishermen present the seafood they have caught, and buyers whisper their price to the fishermen. What makes it even more unique is that anyone can try their luck and whisper the price, not just fishmongers, but also ordinary people. However, with the rapid development of Penang and its expansion into Seberang Perai due to high land requirements on the island, there is concern that this tradition may be lost if development proceeds without considering the traditional values of the area. Meanwhile, despite the rapid economic and overall development of Penang, which is categorized as one of Malaysia's rapidly developing states alongside Selangor and Johor, the fishing community in Kuala Muda still lags behind in terms of economic progress and continues to face poverty. Taking advantage of Penang's reputation as a tourism state, there is an opportunity to promote these traditional values through tourism, aligning with the objectives stated in the RSNPP2030 plan, which aims to enhance the tourism sector in Penang. Furthermore, according to the data from RSNPP2030, there has been an increase in the number of tourists visiting Penang. This initiative can be implemented to benefit both the state and the fishing community by showcasing and preserving their traditional values.

Fishing community in Kampung Kuala Muda, Seberang Perai, Pulau Pinang still plagued by poverty even though the development of Pulau Pinang is developing rapidly in terms of economy and development. The fishermen only rely on their catches and government subsidies for their economy that make them still in poverty. There is a need to find a way that can enhance their economic development with what they have as an opportunity to attract tourist such as fisheries tourism.

This research will contribute a design guideline on fisheries tourism that can emerge with surrounding neighborhood context and improve the economic development of fisherman community. This research also helps on designing the need of fisherman to enhance their economic development through fisheries tourism. Therefore, this research giving a new reference or new model to fishing village with other function and activities to be a new node as tourist attraction. This research will contribute towards to find the alternative way to diversify the livelihood of fisherman community. This research providing a model on designing fisherman community facilities as tourist attraction towards improve fisherman economic development.

2. LITERATURE REVIEW

2.1 Diversifying livelihood of fishing village.

Livelihood diversification, also known as occupational mobility, pluri-activity, occupational multiplicity or occupational pluralism and its sustains many fishers and communities around the globe, helping them to cope with poverty and vulnerability, (Diego Salgueiro Otero 2022). Diversification is a process by which households engage in multiple income generating activities. It is a strategy for spreading risk and reducing vulnerability and formulation of promoting diversification to alleviate poverty. The purpose of diversification is thus to develop portfolios of income generating activities with low covariate risk among their components (Frank Ellis 2000). According to Matthew B. Roscher,(2022) stated that livelihood diversification is defined as "... the process by which families construct diverse portfolios of activities and social support capabilities in their struggle for survival and in order to improve their standard of living". In low-to middle-income area, rural people often employ a diverse portfolio of livelihood activities across multiple sectors in a complex and dynamic way (Matthew B. Roscher, 2022). Rural livelihoods scholarship commonly finds that people with diverse livelihood activities are less vulnerable or more resilient than those with a greater reliance on fewer sources of food and income. The purpose of diversification is thus to develop of income generating activities with low covariate risk. According to Matthew B. Roscher, (2022) stated that livelihood diversification has been advanced as a prominent strategy to reduce vulnerability and income poverty in rural development and fisheries management for decades. According to Cécile Brugère (2008) stated that the outcome of a diversification process is a larger number of income generating activities households with more than one activity outside the agricultural/fisheries sector could be considered as less poor, less vulnerable, or whether it is the fact that households are able to continuously change and adapt their portfolio of activities that makes them less poor and less vulnerable. Thus, diversification is widespread and has been occasionally shown, when households can seize opportunities, to offer them a pathway out of poverty, Cécile Brugère (2008). The benefits of diversification as a means to achieve increased income and livelihood security, Matthew B. Roscher, (2022). Furthermore, the diversity of pursuits of fishers, explained by the richness of the environment in which they live, the diversity of the natural resources at their disposal, and their social and cultural background. The physical and biological diversity of the land-water interface may bring opportunities to those living there (FAO 2008).

Economic transitions from fishing into coastal tourism are common in many contemporary coastal communities globally. A case study from a village in Liaoning province in Northeastern China, they use an economy framework to more systematically understand the drivers and outcomes associated with the transition from fishing to tourism by the state policies and market forces

have encouraged shifts away from fishing and into tourism. Haoxuan Sa (2022) stated that the economic transitions from fishing to coastal tourism are mediated by these inter-related and shifting relationships between state, society, and markets.

Based on site observation, the current fishing community in Kuala Muda relies only on fishing as their primary source of income. Some of the community tried to find other income that relate to their nature and place. This study will be focusing on how to diversifying livelihood of fishing village by exploring alternative ways to generate their income.

2.2. Potential activity in fishing village.

Fishing villages and oceans offer various resources and include excellent natural environments and unique cultures that can make such villages attractive spaces to meet the health, culture, and environmental needs of individuals, Sunwoo Park (2021). Therefore, traditional fishing villages are popular places for tourists and visitors looking for authentic portraits of which fishermen, fresh fish and seascapes are involved. This is seen by the tourism sector as an opportunity to promote marine and coastal destinations, offering a range of experiences that are linked to the fishing traditions of marine heritage. According to Jordi Vegas Macias (2019) stated that tourism has the potential to “strengthen identities and regenerate local heritage”, in which local products, festivals, culinary and job-related skills find in tourism an opportunity for their preservation, stimulating sustainable development. Alternative opportunities are possible to gain additional income through innovation and diversification, e.g. by creating synergies between traditional sectors and tourism.

Besides that, according to Fishery Local Action Groups (FLAGs) promote fisheries-related tourism activities for economic local development in coastal areas. The activities of “pesca-tourism” and “itti-tourism” can play a “multi-functional” role in the development of fishing villages and in the enhancement of their human, environmental, natural, scenic, historical and cultural resources. Agata Nicolosi (2016) said local products, festivals and traditions / popular events related to fisheries, recipes of the local tradition gastronomy, flora and fauna marine, mammals and birds’ diversity of landscapes, coasts, beaches, waters, cliffs Unspoiled natural environment also can be the potential activity. According to Celeste Jiménez de Madariaga (2018) stated that the activity of fisherman and community of fishing village can be integrate into the fisheries tourism. It can turn fishing cultural heritage into a resource for tourism. Some remarkable tourism business ventures are taking advance of the aforementioned options offering visits to wholesale fish markets, fish cannery, salt marshes and fishing port facilities and share a day’s fishing on the vessel.

Kyvelou (2020) said Fishing village with a huge potential in both the fisheries and the tourism sector, was used as focus area where a co-development process was designed aiming to identify advantages/potentials and challenges/ disadvantages of the co-existence of artisanal fisheries and tourism. Fishing tourism may substantially contribute to the reconnection of nature and culture, towards quality marine and coastal landscapes. Therefore, Angulo-Valdes (2022) mention recreational fishing sector could contribute to economic development that can preserve jobs and food security. Moreover, Butler (2020) said globally, recreational fisheries have been identified as significant contributors towards national economies. The potential value of the recreational fishery should be in order to build environmental stewardship and conservation mindedness within the community to create linkages with the recreational fishery. Edi Susilo (2021) mention that not only the fisherman activity can include in the tourism but the social activity of fisherman’s wife also can be added. Thus, Whittingham et al. (2003) said Coastal zones and communities have a huge range of ecosystems supporting coastal livelihoods provides coastal dwellers with many opportunities for extraction (e.g. reefs, mudflats, mangroves etc.)

However, the current activity in fishing village are not promote or develop as tourism attraction as an alternative to fishing community’s livelihoods. This study will focus on analyze the potential activities in Kuala Muda fishing village and the need of activities that can be promote as tourism product.

2.3. Model of fisheries tourism as tourist attraction and improve fishing community livelihood.

According to Kristen Ounanian (2021) stated that coastal zones are historically rich with unique land/seascapes, tangible artifacts, and intangible cultural heritage is the greater incorporation of Coastal and maritime cultural heritage (CMCH) for a regional development and blue growth. Apart from that, coastal and maritime cultural heritage (CMCH), such as fishing-related activities, seafood and historical buildings along the seafront, is important for connecting and understanding the identity of communities and places linked to the sea. At the same time, CMCH is a key resource for developing tourism in coastal destinations. In tourism development, CMCH is often used and transformed for the benefit of the visitor experience, (Jordi Vegas Macias 2023). Thus, concepts of communities of meaning and communities of participation to address how CMCH is created and contested and identify key considerations for its management. Building on theories of space, place, and identity, the paper constructs communities of meaning in order to elaborate the various opportunities but also tensions in preserving CH and cultivating reliant enterprises as a part of wider regional development strategies, Kristen Ounanian (2021).

Community-based tourism (CBT) in rural areas can improve the quality of life of residents in those areas. It also increases respect for local cultures and maintains biodiversity. In the same vein as the Sustainable Development Goals (SDGs), the United Nations' global goal is to preserve and promote local culture by revitalizing fishing villages, Sang Min Lee (2021). As society has developed, fishing villages that have relied solely on traditional fishing have found themselves on the verge of extinction. Therefore, efforts are being made to transform fishing villages into areas with various functions including recreation, tourism, and education, Donghan Kim (2021). The United Nations presented the Sustainable Development Goals (SDGs) as a set of common goals for the international community to achieve together. These goals include elements of sound economic growth, social engagement, and sustainable development, and they emphasize central values such as harmony between humans and the environment, dignity, and equality. Among them, 'Decent Work and Economic Growth' (Goal 8), 'Responsible Consumption and Production' (Goal 12), and 'Preservation and sustainable use of ocean, sea and marine resources' (Goal 14) are directly related to tourism. Accordingly, the World Tourism Organization (UNWTO) has applied the United Nations' Sustainable Development Goals (SDGs) to tourism to encourage sustainable tourism, fair tourism, green tourism. According to the UNWTO, sustainable tourism is tourism that fully considers its own current, social, and environmental impacts, such as meeting the needs of visitors and communities, preserving natural cultural resources, and minimizing environmental damage.

According to Won Seok Lee (2021) stated that to maximize the effectiveness of the development of fishing village tourism, it is necessary to both expand infrastructure and discover unique assets such as natural landscapes, cultural heritage sites, and local specialties. In addition, for fishing village tourism to serve as a sustainable means of revitalizing the region, it is essential to have systematic diagnosis and strategies to verify the environmental analysis and development direction. Therefore, the establish comprehensive scope encompassing aspects of various fields involving the economy, society, and environment for the sustainable development of fishing villages, and it will determine the ideal application of the direction of development, Sangmin Lee (2021). Thus, fisheries tourism is a model of tourism succeeds in creating potential from coastal areas, embracing the fishing industry in the strict sense, and more generally the landscape, culture and local cuisine. A successful tourism service should provide three main dimensions: fishing culture, food tradition and sea-land territory involvement. It could attract tourists, generating income opportunities through a process of more sustainable exploitation of sea and inland local resources, Maria Bonaria Lai (2016).

According to Su (2017) there have five key features for tourism model were identified: seafood meals, participatory fishing activities, hassle-free experience and personalized services, expose to fishing culture and local hospitality and business and service reliability. Community-based

tourism, incorporating fishing culture and island lifestyles with tourism experiences has been developed. Archived positive outcomes in boosting regional economic development, enhancing island livelihood sustainability and promoting and reinforcing island identity. Therefore, Bob (2018) mention coastal and marine tourism (CMT) as part of the oceans economy, offers significant development opportunities that can contribute to job creation and sustainability. The opportunity has taken that create a model supply to coastal and marine tourism business owners, accommodation establishment, tour operators, restaurant, retail outlets. Therefore, Lee (2021) said fishing villages and ocean offer various resources and include excellent natural environments and unique culture that can make such villages attractive spaces to meet the health, culture, and environmental needs of individuals. The opportunities and strength area are relatively important when it comes to priority of sustainable development. The application of tourism in the current context is the potential approach of fishing village tourism. Thus, So-Min Cheong (2013) said the location of fishing communities affects the type of tourist services that they carry example for fishing communities with a beach located in front of or on one side of the village, accommodations and restaurants thrive. In instances where fishing communities do not have beaches nearby, recreational fishing is popular. Recreational fishing spots are usually located by a dike or use big rocks linked to the land. If a scenic view is the major draw, restaurants and accommodations develop along the coastal highway or road. Overall, the major tourist services consist of accommodations, seafood restaurants, and charter boats. Other tourism activities include local fish markets and the opening of seabed or aquaculture sites to allow educational experience.

However, the current element in fishing village are not well strategize as tourist attraction, it only limited fishing as main income. This study will be focusing on how architecture can create a model of fisheries tourism as tourist attraction & improve the livelihoods of fishing community.

3. Conceptual framework

Fisheries tourism started since a long time ago in other countries and this strategy is one of the strategies to improve fisherman community livelihood. At the same time, it creates a sustainable income for the whole fishing village. Fisheries tourism model has designed to take advantage of the potential activity in the fishing village to encourage visitors or tourists to explore the village and gain a new experience in the village. There are various activities in the fishing village that can be developed as an opportunity that can attract the interest of visitor and tourist to the area. Fishermen's daily activities such as mending nets, repairing boats can be used as an attraction for tourists to get closer to the life of fishermen. Apart from the activities of fishermen, the activities of fishermen's wives and local people can also be highlighted. Among the activities carried out by fishermen's wives and local people is the processing of local products such as the manufacture of fish crackers, salted fish, pickled fish or 'pekasam', traditional food and other activities that can be introduced and become an attraction. In addition to that, the village community has a variety of interesting celebration events throughout the year that symbolize the culture and social of the local community. These celebration events can provide a valuable experience if promoted, it can attract visitors and tourists to experience the celebration and culture of the local community. The topography of a fishing village is one of the main attractions that can attract tourists to the fishing village. The condition of a fishing village surrounded by beautiful beaches, forests, rivers and so on. With the existence of these assets around the fishing village, it can be developed with various leisure activities such as picnics, camping, kayaking along the river and so on. Apart from that, the life of flora and fauna is also an attraction that can attract visitors and tourists to the fishing village. A fishing village rich in biodiversity as a variety of living things that support each other is an attraction for tourists who love nature.

A design model fishing village as a fisheries tourism can be built taking into account all aspects of the potential found in fishing villages. That aspect does not only include the fishing community but the context of the whole area. With the existence of this model, it can benefit the community through tourism-related activities. From that, it will create a job opportunity, then it will improve the livelihood of the fishing community.

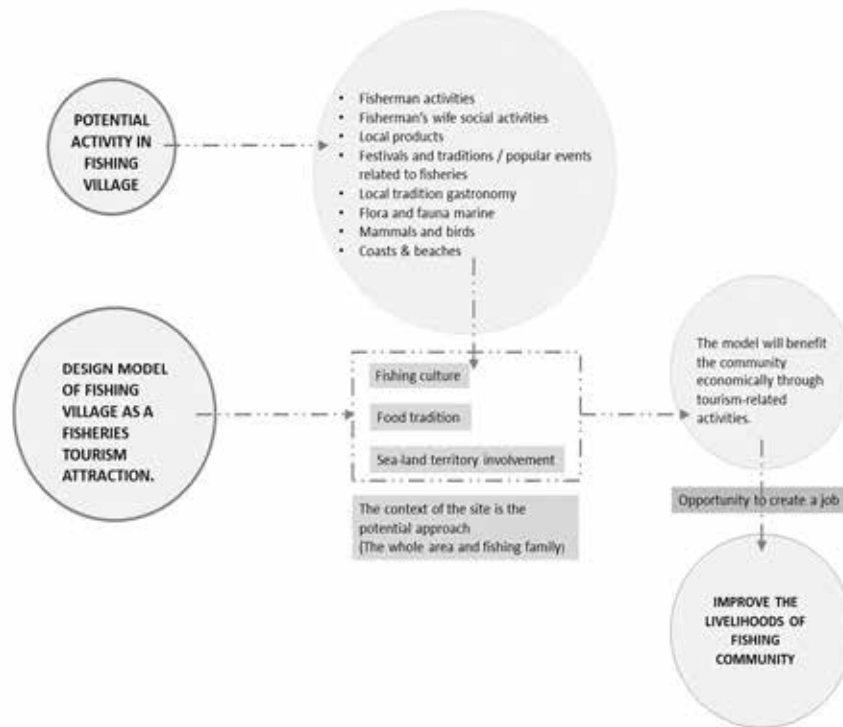


Figure 3.1: Conceptual Framework

Source: Author

4. METHOD

The research method for this dissertation divided into 4 main stages. The first stage is research formulation stage, analyze the data from literature review and formulate research aim, research question and research objective. The second stage is data collection by using result of research objective and generate survey question (quantitative) and the questionnaire distributed through online platform and on site physical survey question. The third stage data analysis is using the data collected form questionnaire and examined the highest frequency of respondent feedback and formulate the new typology or spaces. Final stage is research outcome stage that discuss the finding and generate conclusion, recommendation and propose a new architectural design strategy for the future. Figure 3.1 illustrate the research methodology framework for this study.

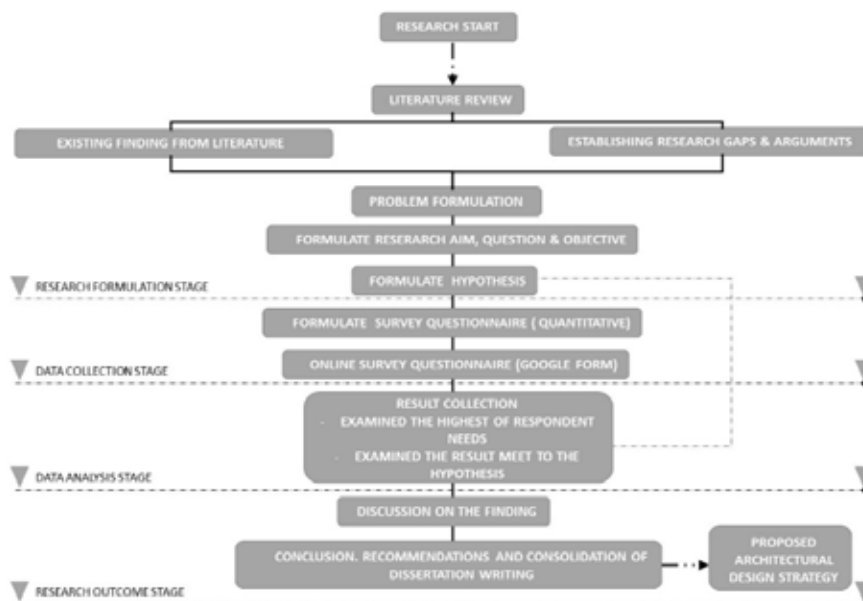


Figure 4.1 Research Methodology Framework Source: Author

The study used a quantitative approach to understand the potential activity and attraction in Kuala Muda fishing village and their preferred design element that can attract visitor to their place and create a fisheries tourism model as an alternative to diversify the livelihoods.

The results of the research described in this paper are based on survey data acquired from one hundred and four (104) randomly select respondents. The respondents are those living in Kuala Muda fishing village and those who are familiar with Kuala Muda fishing village, and their ages range from 21 to 60 years old.

The survey questionnaire titled “Exploration of Fisheries Tourism as an Alternative to Diversify the Livelihoods of the Fishing in Kampung Kuala Muda, Penaga” was administered using both an online platform, specifically Google Form, and a physical Google Form distributed on site. The present study employs a questionnaire survey to investigate the prospective value of the Kuala Muda fishing village, as well as gather opinions regarding the various elements and designs that could be implemented to develop the village as a fisheries tourism destination in the future. The results obtained from this survey will provide valuable insights into the potential activities available in the fishing village of Kuala Muda, as well as enhance our understanding of the lifestyles of the fishermen and the local community. The results obtained from this survey will provide valuable insights into the factors that should be considered when developing the Kuala Muda fishing village as a new model for fisheries tourism. This information will aid in attracting individuals to the fishing village and simultaneously create new prospects and opportunities for the local fishing community, serving as an alternative means to diversify their sources of income.

Survey questionnaires consist of a series of inquiries that encompass various aspects, such as the degree of agreement, preferred values, events, activities, and lifestyles associated with the development of Kuala Muda fishing village as a potential tourist attraction. A collection of questionnaires has been included in Appendix A.

During the data analysis phase, the focus will be on examining the most frequently occurring values, potentials, events, and activities in the Kuala Muda fishing village that respondents desire to develop as a tourist attraction. This development aims to attract a larger number of visitors and create new opportunities to diversify the local livelihood through the implementation of a fisheries tourism model. The results are being examined in order to verify the hypothesis that was put forth during the initial stages. The data collected will be analyzed using Microsoft Excel in order to identify the predominant frequency of respondent preferences regarding value, potential, activities, lifestyle, facilities, and amenities at the Kuala Muda fishing village. This analysis aims to explore potential opportunities for diversifying the livelihoods of the community beyond solely relying on fishing.

5. RESULT

A comprehensive set of 73 questions, including sub-questions, has been organized into three sections. The purpose of these questions is to assess the potential, value, and activity in Kuala Muda that can be harnessed for the development of fisheries tourism. This development aims to attract visitors while simultaneously creating new opportunities for the fishing community to diversify their livelihood. The survey was conducted among a total of 104 participants. Approximately 51.9% of the participants identified as male, while 48.1% identified as female. The total number of respondents is 104. Approximately 61.5% of the respondents fall within the age range of 41 to 60 years old, while 35.6% of the respondents are 21 years old. This particular age group, consisting of individuals aged 41 to 60, is the primary focus of the research as they are considered the main contributors to the family's economy. A total of 2.9% of the respondents fell within the age range of 13 to 20 years old. There were no respondents below the age of 12. The majority of the respondents in the study are married, comprising approximately 80.8% of the total sample. Conversely, the remaining 19.2% of respondents reported being single. The majority of the respondents possess a higher level of education, with 51.9% having obtained a university degree. The percentages of individuals who pursued further education after completing secondary, college, and primary education were 24%, 23.1%, and 1%, respectively. More than half of the respondents, specifically 56.7%, reported being employed, while 31.7% of the respondents

identified themselves as self-employed. A total of 8.7% of the respondents in the study were found to be unemployed, while 1.9% identified themselves as students and 1% reported being retired.

Regarding the inquiry pertaining to prior engagement in fisheries tourism, a majority of the respondents indicated a lack of participation in this domain. Specifically, approximately 57.7% of the respondents responded negatively, while the remaining 42.3% affirmed their previous involvement in fisheries tourism.

The inquiry in Section B of the questionnaire pertains to identifying prospective activities in Kuala Muda that have the potential to be developed as tourist attractions.

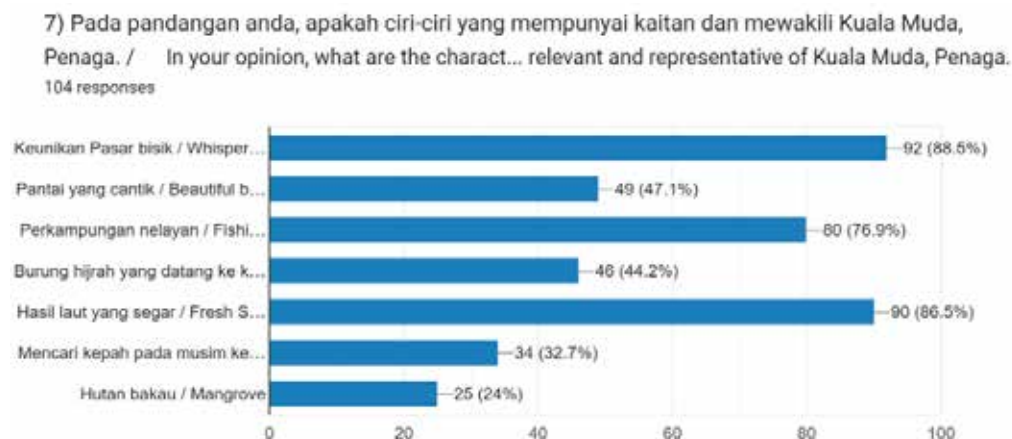


Figure 5.1: The characteristics that are relevant and representative of Kuala Muda, Penaga.

(Image Source: Author)

According to the survey data, a significant majority of respondents, specifically 88.5%, expressed that the primary characteristic associated with Kuala Muda, Penaga is the presence of the “Pasar bisik” or whispering market. A total of 86.5% of the respondents expressed a preference for fresh seafood, while 76.9% indicated a preference for fishing villages. Additionally, 47.1% of the respondents chose beautiful beaches as their preferred attraction, while 44.2% mentioned migration birds. A smaller proportion, 32.7%, expressed interest in the clam season, while mangroves were the least represented option at 24%.

Table 5.1: Levels of important factors of Kuala Muda, Penaga as a tourist destination.

Criteria	Frequency					AverageIndex	Level of Agreement
	1	2	3	4	5		
Unique culture (Pasar Bisik)	-	-	5	29	70	4.62	Strongly agree
Clean village	-	2	18	30	54	4.30	Agree
Beautiful beach scenery	-	-	12	41	50	4.35	Agree
Friendly people	-	-	16	35	53	4.35	Agree
Fishing & boating	-	-	22	44	38	4.15	Agree
Ecosystem & biodiversity (Migration Birds)	-	1	6	40	57	4.43	Agree
Fresh Seafood	-	-	1	18	85	4.80	Strongly agree

Source: Author

The findings of the survey indicate that a significant number of participants strongly agree on the pivotal role played by fresh seafood and the distinctive cultural experience offered by Pasar Bisik in Kuala Muda, Penaga, as key factors contributing to its appeal as a tourist destination. In addition, it is widely acknowledged that the presence of a diverse ecosystem and rich biodiversity, particularly in terms of migratory bird species that frequent the area annually, along with the amiable local populace, picturesque beach landscapes, and pristine village environment, constitute crucial factors contributing to the allure of Kuala Muda, Penaga, and its ability to attract individuals. In addition, it is acknowledged that fishing and boating are significant factors due to the geographical proximity of Kuala Muda to both the sea and river.

Table 5.2: Levels of main nature attraction in Kuala Muda, Penaga.

Criteria	Frequency					AverageIndex	Level of Agreement
	1	2	3	4	5		
Migration birds	1	-	11	36	56	4.40	Agree
Mangrove	1	3	22	31	47	4.15	Agree
Fisheries	-	-	4	14	86	4.78	Strongly Agree
River	-	-	14	34	56	4.40	Agree
Beach	-	-	13	33	58	4.43	Agree

Source: Author

A substantial majority of the respondents' express strong agreement regarding the primary natural attraction in Kuala Muda, Penaga, which is fisheries. This assertion is primarily based on the geographical location of the area and the predominant activity that revolves around fisheries. The respondents concur that the primary attractions in this region are migratory birds, mangroves, rivers, and beaches.

Table 5.3: Levels of main culture & tradition attraction in Kuala Muda, Penaga.

Criteria	Frequency					AverageIndex	Level of Agreement
	1	2	3	4	5		
Fishing tradition	-	-	4	27	73	4.66	Strongly Agree
Historical place	1	2	29	27	45	4.08	Agree
Whispering market	-	-	5	23	76	4.68	Strongly Agree
Cultural festival	-	1	30	36	37	4.04	Agree
Local cuisine	-	-	6	36	62	4.53	Agree

Source: Author

The majority of respondents express a strong agreement regarding the primary cultural and traditional attractions in Kuala Muda, Penaga, namely the Whispering Market and the fishing tradition that has been passed down through generations. In addition to the aforementioned point, the respondent also concurs that local cuisine serves as a cultural attraction, particularly renowned for its seafood-based dishes. In addition to the cultural festival, there are various cultural attractions that include a boat parade celebration, a communal gathering known as "gotong royong" for the "kenduri" event, performances of the traditional martial art form known as silat, and other festival celebrations. The respondent concurs that Kuala Muda is a significant historical site where one can find an ancient jetty that was utilized during the Old Kedah Kingdom. Additionally, the respondent notes the presence of the Fort of Kota Kuala Muda in this vicinity.

Table 5.4: Levels of potential activities in Kuala Muda, Penaga that can be developed as a tourist attraction.

Criteria	Frequency					AverageIndex	Level of Agreement
	1	2	3	4	5		
Participating in fish whispering auctions or markets	-	2	9	22	71	4.55	Strongly Agree
Fishing tours and excursions (Day out with fisherman)	-	-	8	34	62	4.51	Strongly Agree
Boat rides and coastal cruises	-	-	10	42	52	4.40	Agree
Exploring fishing village (Village walk)	-	-	14	44	46	4.30	Agree
Birds watching tours	-	2	12	34	56	4.36	Agree
Seafood culinary	-	-	2	22	80	4.75	Strongly Agree
Coastal or river fishing	-	-	10	44	50	4.38	Agree
Cultural event or festivals	-	1	28	31	44	4.13	Agree
Culinary experiences - making local product	-	2	24	29	51	4.20	Agree

Source: Author

The respondents strongly agree regarding the potential activities in Kuala Muda, Penaga that can be developed as tourist attractions. The highest average index level of agreement is strongly in favor of seafood culinary experiences. This is followed by participating in fish whispering auctions or markets, as well as fishing tours and excursions, such as a day out with a fisherman. In addition, the respondents also express agreement with engaging in boat rides and coastal cruises, partaking

in a village walk to explore fishing villages, participating in bird watching tours, engaging in coastal or river fishing activities, and experiencing culinary endeavors such as the production of local products like dodol, kuih karas, coconut oil, keropok lekor, and various others. Lastly, it is important to note that respondents also concur that cultural events or festivals have the potential to be developed as tourist attractions.

In Section C of the questionnaire, participants are asked to provide their opinions on the design elements that would be suitable as tourist attractions in Kuala Muda, Penaga.

Table 5.5: Design elements that important in making Kuala Muda, Penaga attractive to tourists.

Criteria	Frequency					Average Index	Level of Agreement
	1	2	3	4	5		
Transportation network (Accessibility, ease of reaching Kuala Muda, Penaga.)	-	-	5	24	75	4.67	Strongly Agree
Pasar Bisik unique tradition (Preservation of cultural heritage)	-	-	2	21	81	4.75	Strongly Agree
Integration of fishing activities (e.g., fishing tours)	-	-	7	44	53	4.44	Agree
Recreation and entertainment facilities (e.g., boat rides, water sports, cycling)	1	1	10	42	50	4.33	Agree
Scenic views (natural landscapes, coastline)	-	-	6	33	65	4.56	Strongly Agree
Local cuisine and dining options	-	-	4	26	74	4.67	Strongly Agree
Shopping (seafood, local product)	1	-	8	23	72	4.58	Strongly Agree
Accommodation options (chalet, homestay)	-	-	16	33	55	4.37	Agree
Environmental conservation efforts (mangrove, migration birds)	-	-	4	23	77	4.70	Strongly Agree

Source: Author

The majority of respondents strongly agree that Pasar Bisik is the main design element in Kuala Muda, and the design should include the preservation of the cultural heritage, which is the unique tradition of Pasar Bisik itself. Furthermore, they also express strong agreement regarding the importance of environmental conservation efforts for the mangrove and migratory birds. Considering the natural landscapes and coastline, there is potential to develop a place for scenic views, such as a viewing tower or viewing deck, which would allow visitors to enjoy the stunning vistas. Respondents strongly support the idea of enhancing local cuisine and dining options, proposing establishments like a seafood restaurant by the river or even a floating restaurant. Moreover, the respondents also recognize the significance of shopping in making Kuala Muda attractive to tourists. Therefore, it is suggested to set up a shopping bazaar that sells local products and features a cultural fish market. To accommodate visitors, respondents agree that Kuala Muda should have various lodging options, such as chalets and homestays, providing them with an opportunity to spend a night in the village. Lastly, respondents also agree that integrating fishing activities, such as fishing tours, recreational pursuits, and entertainment facilities, is crucial in the design elements to make Kuala Muda, Penaga, appealing to tourists.

15) Elemen reka bentuk khusus manakah yang akan menjadikan Kuala Muda, Penaga lebih menarik? / Which specific design elements would ...husus / Please select 5 specific design elements)

104 responses

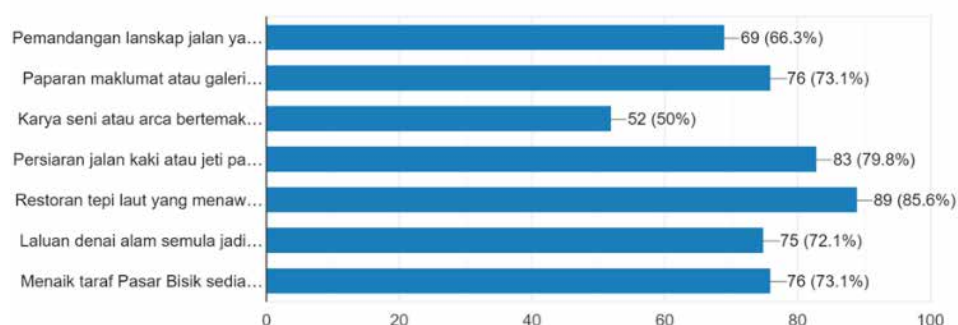


Figure 5.2: Preferred specific design elements would make Kuala Muda, Penaga more attractive (Image Source: Author)

According to the survey results, a significant 85.6% of respondents expressed a preference for waterfront restaurants that offer fresh seafood as a specific design element to enhance the attractiveness of Kuala Muda, Penaga. Additionally, 79.8% of respondents favored the idea of having unique waterfront promenades or piers. The survey also revealed that 73.1% of respondents would like to see interpretive displays or galleries showcasing the fishing and local heritage, as they believe this would facilitate learning and understanding about the area. Similarly, 73.1% of respondents supported the upgrading of the existing Pasar Bisik to create a more welcoming ambiance. Nature trails or scenic viewpoints were also highly favored, with 72.1% of respondents expressing a preference for these features. Additionally, 66.3% of respondents desired a colorful and vibrant streetscape to add charm and character to the surroundings. Lastly, 50% of the respondents indicated their preference for fishing-themed artwork or sculptures, as this could contribute to creating a unique sense of place and serve as a popular area for Instagram-worthy photographs. In summary, the survey results provide valuable insights into the preferences of respondents, highlighting various design elements that could significantly enhance the attractiveness of Kuala Muda, Penaga.

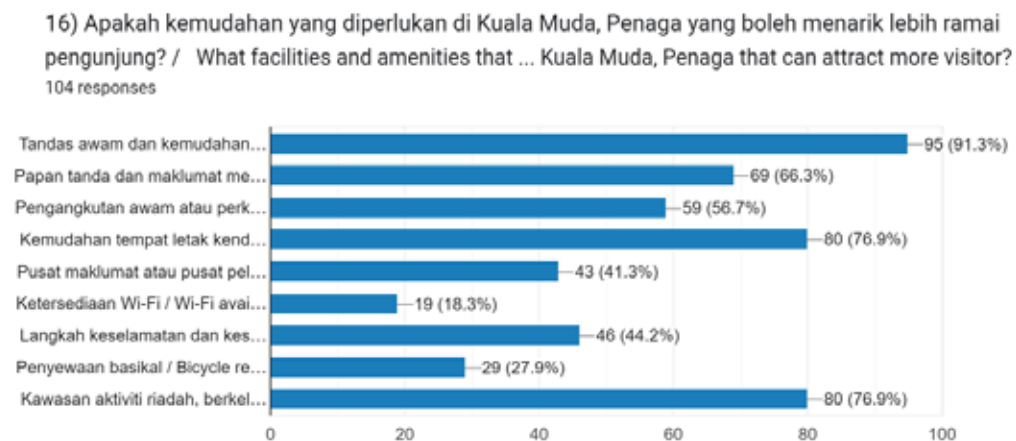


Figure 5.3: Preferred facilities and amenities that need in Kuala Muda, Penaga that can attract more visitor
(Image Source: Author)

The survey results indicate that 91.3% of respondents prioritize the presence of public restrooms and clean facilities, recognizing their importance in attracting more visitors. Additionally, 76.9% of respondents expressed a desire for picnic areas or seating spots, and an equal percentage of respondents also emphasized the need for sufficient parking facilities to accommodate more visitors in Kuala Muda. Furthermore, 66.3% of respondents indicated their preference for signage and wayfinding information, which would enable visitors to explore the area independently. In addition, 56.7% of respondents considered good public transportation or shuttle services to be an essential aspect. Concerning safety and security measures, 44.2% of respondents highlighted their importance. However, a slightly higher percentage, 41.3% of respondents, also expressed a preference for an information center or visitor's center. Less preferred among the respondents, at 27.9%, was the option for bicycle rentals, while Wi-Fi availability was the least prioritized, with only 18.3% of respondents indicating an interest in this feature. In conclusion, the survey findings reveal the key facilities and services that are highly valued by respondents to enhance the attractiveness of Kuala Muda to visitors.

Table 5.6: Waterfront developments that suitable for Kuala Muda, Penaga

Criteria	Frequency					Average Index	Level of Agreement
	1	2	3	4	5		
Beachfront promenade with walking paths and seating areas.	-	-	3	29	72	4.66	Strongly Agree
Fishing piers or docks for recreational fishing activities	-	-	4	47	53	4.47	Agree
Waterfront restaurants or cafes offering fresh seafood.	-	1	7	17	79	4.67	Strongly Agree
Public parks or green spaces with picnic areas.	-	1	8	37	58	4.46	Agree
Marina for docking boats and yachts	2	1	16	40	45	4.20	Agree
Interpretive displays or gallery showcasing the fishing heritage.	1	1	17	41	44	4.21	Agree
Water sports facilities (e.g., kayaking, paddle boarding).	1	3	23	37	43	4.07	Agree
Public art installations related to fishing or marine life.	3	3	17	44	37	4.04	Agree
Outdoor performance spaces for cultural events or entertainment.	2	2	24	38	38	4.03	Agree
Shopping and craft markets along the waterfront	3	-	17	37	47	4.20	Agree

Source: Author

The majority of respondents strongly agree that waterfront restaurants or cafes offering fresh seafood are the most suitable waterfront development for Kuala Muda. Similarly, the beachfront promenade with walking paths and seating areas is also strongly supported by the respondents. Moreover, respondents agree that fishing piers or docks for recreational fishing activities would be ideal for attracting visitors to the waterfront in Kuala Muda. Additionally, public parks or green spaces with picnic areas are mostly agreed upon by the respondents. They also express agreement with the inclusion of interpretive displays or galleries showcasing the fishing heritage as part of the waterfront development. Furthermore, the respondents support the idea of having shopping and craft markets along the waterfront, providing opportunities for local commerce. They also agree on incorporating water sports facilities such as kayaking and paddle boarding to enhance the waterfront experience. Another aspect that the respondents find suitable for waterfront development in Kuala Muda is the inclusion of public art installations related to fishing or marine life, which could add aesthetic and cultural value to the area.

Table 5.7: Design elements would be well-suited for exploring Kuala Muda as tourism place

Criteria	Frequency					Average Index	Level of Agreement
	1	2	3	4	5		
Architectural aesthetics that reflect the village's fishing heritage	-	1	4	19	80	4.71	Strongly Agree
Well-planned and easily accessible walking paths or trails.	-	-	6	37	61	4.52	Strongly Agree
Interpretive signage or displays that provide information about the village's history and culture.	-	2	9	39	54	4.39	Agree
Public spaces or plazas for social gathering and interaction.	1	1	15	41	46	4.25	Agree
Scenic viewpoints that offer panoramic views of the village and its surroundings.	-	-	9	25	70	4.58	Strongly Agree
Seating areas or benches for resting and enjoying the village's atmosphere.	1	-	13	27	63	4.45	Agree
Waterfront enhancements, such as boardwalks or piers, for closer proximity to fishing activities.	-	1	4	30	69	4.60	Strongly Agree
Lighting features that enhance the village's ambiance during evening or nighttime visits.	-	-	9	39	56	4.45	Agree

Source: Author

The majority of respondents strongly agree that architectural aesthetics reflecting the village's fishing heritage are the most suitable design elements for exploring Kuala Muda as a tourism destination. They also strongly support waterfront enhancements, such as boardwalks or piers, to allow for closer proximity to fishing activities. Additionally, respondents strongly agree that scenic viewpoints offering panoramic views of the village and its surroundings are essential for enhancing the experience. Furthermore, they strongly agree that well-planned and easily accessible walking paths or trails would be well-suited for exploring Kuala Muda as a tourism place. Respondents also agree that providing seating areas or benches for resting and enjoying the village's atmosphere is crucial. Moving on, respondents mostly agree on the incorporation of lighting features that enhance the village's ambiance during evening or nighttime visits. They also express agreement regarding the importance of interpretive signage or displays that provide valuable information about the village's history and culture. Moreover, the inclusion of public spaces or plazas for social gathering and interaction is another design element that respondents agree would be well-suited for exploring Kuala Muda as a tourism place.

6. DISCUSSION

The Kuala Muda fishing hamlet, known for its cultural diversity, historical significance, and harmonious coexistence with the natural environment, is the subject of this study. We aim to illuminate this village's distinctive characteristics and provide a full understanding of its cultural, historical, and ecological aspects through an in-depth examination. This research explores Kuala Muda's unique tapestry to add to the knowledge of traditional fishing communities and its relevance in human-environment interactions. These components have great promise for the region because they offer many various activities that can attract visitors. The fishing community can diversify their livelihood beyond fishing with visitor-friendly activities. Kuala Muda's "Pasar Bisik," or whispering market, is its most notable feature. This study examines market behavior as a cultural practice passed down from generation to generation and yet alive now. In this market, purchasers individually bid on prices with fishermen. Buyers can try their luck and negotiate rates in a unique way. This exercise is inclusive, allowing anybody to participate, including fish trade experts. Fresh seafood defines Kuala Muda. People regularly eat fish, crab, cuttlefish, prawns, and other seafood. The fishing village's location enhances Kuala Muda's atmosphere. The community is conveniently positioned near a beautiful beach and the Sungai Muda riverside. Migratory birds forage in coastal and mangrove environments. During low tide, Malaysia's Kuala Muda district experiences 'musim kepah,' a time with low water levels. These phenomena attract clam gatherers. This study seeks to define Kuala Muda, Penaga, and its distinctive attractiveness as a destination. We aim to fully grasp this place by analyzing its many facets. Kuala Muda, Penaga, in [insert geographical place], is unique. Collectively, these traits define its identity. We strive to illuminate the region's appeal through in-depth investigation. Kuala Muda, Penaga is known for its rich culture. A varied society has kept its traditions and customs for years. Local cuisine, architecture, and festivals reflect this cultural tapestry.

Exploring the Allure of Kuala Muda, Penaga: An Analysis of Key Touristic Factors Abstract: This article explores what makes Kuala Muda, Penaga a popular tourist location. This study analyzes what makes Kuala Muda, Penaga a tourist destination by studying its unique traits, natural attractions, cultural history, and accessibility. This study shows the importance of these elements in boosting tourism and offers suggestions for improving the region's tourism potential. 1. Pasar Bisik attracts tourists with its excellent seafood and unique culture. Kuala Muda's ecology and biodiversity attract migratory birds annually, making them interesting. This study examines how the indigenous population's friendliness affects the destination's appeal, creating a welcoming atmosphere for tourists. The stunning beach scenery and village cleanliness of Kuala Muda are the focus of this investigation. This study examines these criteria to determine Kuala Muda's appeal. In conclusion, the destination's proximity to the sea and river has made fishing and boating popular recreational activities, boosting its appeal.

Kuala Muda has two types of attractions: natural and cultural and traditional. Kuala Muda's fisheries are a major natural attraction tied to the region's geography and main industries. The region's migratory avifauna, mangrove habitats, rivers, and beaches enhance its natural beauty.

After analyzing Kuala Muda and its main attractions, a variety of tourism attractions emerge. Fish whispering auctions or marketplaces let tourists experience the unique bidding procedure. Fishing tours are a popular way to immerse people in the sport. One option is to spend a day with local fishermen, learning about this traditional practice. These trips allow participants to see and participate in fishing, enhancing their grasp of the skill. This immersive experience allows people to engage with the local fishing community and understand their lifestyle.

Culinary experiences draw travelers to food tourism. Due to its unique flavors and cultural significance, fish is a potential draw. This article examines the popularity of seafood cuisine and its impact on tourism. Seafood: Cultural Delight: Foodies love seafood for its variety of flavors and textures. Seafood meals frequently represent coastal communities' traditions, adding to their attractiveness. Juicy lob The production of indigenous delicacies like "dodol," "kuih karas," coconut oil, and "keropok lekor" offers tourists a unique opportunity to learn about and participate in local customs. The "Village Walk" lets travelers experience the charming fishing community by boat and coastline cruise. Bird watching excursions allow birdwatchers to see a region's diverse birdlife. This study investigates the possibility of organizing coastal or river fishing trips for interested parties. Cultural events and festivals can also draw travelers. The above events showcase Kuala Muda's culture through local traditions, performances, and festivities.

Kuala Muda, a fishing community, has a charming Malay architectural style. In a peaceful setting with traditional Malay cottages, fishing boats, and a stunning fishing landscape, design must maintain its uniqueness and sense of belonging. Title: Using Traditional Malay Architecture to Improve Kuala Muda's Tourist Appeal Abstract: To attract tourists, Kuala Muda should incorporate traditional Malay architecture as a main architectural element. Malay culture and architecture promote tourism and a sense of location. This study examines the pros and cons of incorporating traditional Malay structures into Kuala Muda's urban fabric by examining its history and architecture. The findings emphasize the need of preserving and presenting traditional Malay architecture to create a unique and captivating tourism destination. 1. Intro: Tourism drives economic prosperity in many countries. All design features must embrace and exemplify traditional Malay architectural style to retain the village's cultural character and attract visitors. The design will honor the village's tradition and enhance its appeal.

Kuala Muda's architecture reflects its culture. This area's main draw is Pasar Bisik. Thus, the suggested intervention must prioritize Pasar Bisik's cultural legacy. This means preserving Pasar Bisik's own tradition without compromise. Uniqueness as Area's Icon This study shows that Kuala Muda has abundant natural beauty and biodiversity. Design aspects should include mangrove and migratory bird conservation. Viewing towers or decks can increase the appreciation of scenic beauty, natural landscapes, and coastal regions. These platforms would allow tourists to see breathtaking views, enhancing their experiences. Increasing local cuisine and eating options attracts tourists. We propose a seafood restaurant on a scenic river and a floating restaurant in this discussion. These recommendations aim to improve the food scene by giving customers a unique and immersive experience. Kuala Muda's shopping also draws visitors. A shopping bazaar with locally supplied goods and a cultural fish market can capitalize on this beneficial scenario. Chalets and homestays allow guests to spend overnight in the village's atmosphere. Tourism is increasingly combining fishing with lodging. This article discusses how fishing trips, leisure expeditions, and immersion encounters with local fisherman can be smoothly linked with hotels. Tourists can fish on fishing tours. Local fishing experts lead these expeditions. Tourists may easily access popular fishing places and improve their fishing experience by staying near them. Recreational fishing is more laid-back. Recreational fishing accommodations often provide visitors with equipment and facilities. These accommodations may have well-stocked fishing ponds or lakes where guests can enjoy a day of fishing without the in order to meet entertainment needs, the design must include amenities like an expansive plaza and communal areas suitable for cultural events. Strategically arranging the various aspects will make Kuala Muda, Penaga an attractive tourist destination. Kuala Muda, Penaga can attract tourists by properly placing and organizing these components.

7. CONCLUSION

This study shows Kuala Muda's potential as a tourist attraction. The area offers several opportunities for visitor involvement and fishing community diversification. Tourism locations must develop tourism-related design aspects to succeed and survive. These design features include critical tourism infrastructure and facilities. This document emphasizes the importance of tourist locations having public bathrooms, parking, lodgings, restaurants, local transit, and information centers. Tourism design requires public restrooms. Tourists need good restrooms. Clean toilets improve tourist experience and destination hygiene and sanitation. Tourism vehicles need public bathrooms and enough parking. Parking facilities reduce congestion and protect visitors' cars. Well-designed parking areas also improve the destination's aesthetics. Tourism design also requires proper accommodations. Tourists need varied hotel alternatives to meet their needs. Luxury hotels and cheap guesthouses are available. Due of its tourism appeal, Pasar Bisik must be preserved. Respondents showed strong support for Kuala Muda's growth as a tourism destination. A well-appointed space in the fishing village could attract people, create new jobs, boost economic growth, and improve the village's and fishing community's reputation.

This study examines the Kuala Muda fishing community as a tourist attraction. To diversify fishing community livelihoods. This study also provided infrastructure and amenities to another fishing town to improve the environment for tourists and the fishing population. Note that different localities have varied potentials to meet these demands. Abstract: Future studies may focus on farming practices that attract tourists. Researchers can create novel, compelling agricultural tourism experiences by studying this area. This study emphasizes tourist interests and sustainable, responsible farming. This study can inform agricultural tourism research. 1. Intro: Agri-tourism, sometimes known as farm tourism, combines agricultural activities with recreational activities and has gained popularity in recent years. This trend lets tourists gather vegetables, milk animals, and enjoy farm-to-table meals. These activities help rural economies while educating and entertaining. Research Deficit: While agricultural tourism has been studied, people have shown a great affinity for agricultural activities in diverse circumstances. Farm activity is defined by a deep passion and excitement for crop cultivation, livestock raising, and agricultural management. Working hands-on brings such people great joy. Farming in Kuala Muda offers local fisherman a new and possibly lucrative source of income. Paddy fields, coconut plantations, fruit farms, and fish farms allow economic diversification. Other fishing villages provide unique chances for fisheries tourism integration, thus future studies may also examine their potential. These alternative fishing towns can help researchers comprehend the wide range of fisheries tourism options. This research will strengthen and broaden fisheries tourism management.

8. ACKNOWLEDGEMENT

First and foremost, I am grateful to the divine presence for, with its abundant blessings, this research and writing could be completed. I would like to acknowledge and express my deepest gratitude to my supervisor, Dr. Nor Azlina Binti Abu Bakar, who made this work possible. Her guidance and advice carried me through all the stages of writing my project. I would also like to express my gratitude to my studio supervisor, Ar. Aznida Binti Azlan, and Ar. Rushdina Binti Ismail for their guidance and shared ideas in realizing the design thesis project. I would like to extend my highest appreciation to my family, especially my husband, Muhd Nizam bin Muhamad Noor, for all the support and encouragement given throughout my learning journey. To my beloved child, Muhammad Nazmi Naeem, thank you for understanding Mama's busy schedule and I apologize for not being able to give my full attention to you during my studies. Special thanks to my family as a whole for their continuous support and understanding when undertaking my research and writing my project. Your prayer for me was what sustained me this far. Without your support and encouragement, I would not have been able to complete this study. At last but not least, to all my Metanoia Studio's friends, thank you for the wonderful memories throughout my studies. It will last forever.

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RESILIENCY IN ARCHITECTURE

FINDING STRATEGIES FOR FLOATING ARCHITECTURE TO MITIGATE RISING SEA LEVEL IN PULAU KETAM

Edmund Go Chee Heng, Rahinah Ibrahim,

ABSTRACT

A study by the National Water Research Institute of Malaysia (NAHRIM) highlighted that by the year 2100, sea levels around Peninsular Malaysia will rise to 520mm from the current mean sea level. As many as nine states in Malaysia will have parts of their land below the sea level by 2050. Moreover, the Environment and Water Ministry estimated an allocation of RM392 billion would be needed to overcome the country's flood problems for the next 78 years. The current coastal flood mitigation strategies are dominated by constructing flood barriers and raising platform levels. This study found there has been no coastal development in Malaysia that is dynamically adaptive to tide levels. The aim of this study is to investigate potential technologies and systems necessary for developing floating architecture for sustaining coastal economies. This study employs case study research methodology where observation and interview are the main data collection methodology. Results include identification of problems threatening existing coastal developments and analysing potential strategies for used in developing floating architecture. The results contribute towards recommendations on proposing a resilient coastal architecture that would be tide-adaptive and equipped with necessary life-supporting systems. This study is significant as the future floating architecture is expected to benefit the fishing industry of which the stakeholders rely much on the sea for their livelihood. Future studies are recommended on investigating in details the necessary underwater supporting infrastructures that would support a floating architecture.

Keywords: *Floating Architecture; Climate Change; Rising Sea Level; Island Livelihood; Built Environment Informatics*

INTRODUCTION

The main contributors of sea level rise are the melting of glaciers and ice sheets, and the impact of the rise is most apparent on coastal regions, where maritime trades and fishing industries are based. According to the Ministry of Transport of Malaysia, the aforementioned industries contribute to over 50% of Malaysia's GDP. The Second National Coastal Zone Physical Plan of Malaysia states that the west coast of peninsular Malaysia suffers more of the effect of sea level rise than the east coast due to the topography, beach material, population density, extensiveness of infrastructures, as well as concentration of economic activities.

NAHRIM identified that the biggest affected land use is mangrove forest in the Klang islands, which includes Pulau Ketam, one of the famous tourist attractions in the region of Klang islands. Sea level rise has a critical impact on the development of Malaysia's key urban and rural centres, many of which are located in coastal zones (NAHRIM, 2020). NAHRIM also stated that inadequate planning choices made without sufficient knowledge or consideration of coastal processes can lead to the gradual decline of coastal resources and the disturbance of natural coastal phenomena. This leads to the changes in the shape of the coastlines, and finally results in erosion (loss of usable lands), lost development opportunities, decline in land value, as well as exposing the human life and property to various coastal hazards.

According to the National Physical Plan – Coastal Zone, Federal Town and Country Planning Department, Pulau Ketam fulfills two key economic attributes, namely tourism and fisheries, which means the occurrence of human activities in the island is highly prominent and the economic potential of Pulau Ketam is highly dependent on such human activities. Furthermore, Pulau Ketam is the only pristine mangrove among the surrounding Klang islands that is not gazetted into the

permanent forest reserves, putting it at risk of human activity related mangrove deterioration. This means there will be a risk on loss of buffer for sea level rise (SLR) related hazards. One of the worrying key coastal processes that puts Pulau Ketam further at risk of sea level crisis is that it is situated within the tsunami risk area.

Most of the islands of Klang are very low in population density with the exception of Pulau Ketam, which is classified as low and medium density (200-1500 pax/km sq). However, Pulau Ketam is the most westward island within the islands of Klang, towards the Malacca Strait. With its remaining mangrove covers, it acts as one of the important forefront buffers of tsunami waves coming toward the islands of Klang. There are two settlements within Pulau Ketam, namely Bagan Teochew and Bagan Sungai Lima (refer to Figure 1.0). The houses in Pulau Ketam are structured on timber platforms with columns connected to the footing in the swamps. This means that the houses are static and will be flooded over during high tide when coupled with SLR. In order to solve the problem of static buildings on coastal zones in the face of SLR, a more adaptable approach has to be devised.

The waters of Pulau Ketam are very popular for aquaculture industries and are mainly protected by the natural mangroves of the island. It is projected that 1350.50 hectares of land will be further inundated by the year 2100, resulting to a total of 6991.15 ha to be inundated over the years, unless prior adaptation measures are taken urgently (NAHRIM, 2020). Almost all existing settlement of Pulau Ketam will be affected by this SLR trend. However, the current mitigation measures proposed by NAHRIM are, to increase the platform levels at Pulau Ketam to be higher than the anticipated SLR, to provide flap gate at all drains and discharge points, to construct earth dyke at the south east of Pulau Ketam to protect the public utilities such as schools, police station etc. and lastly, through regular maintenance of all drains and through pumping if necessary.

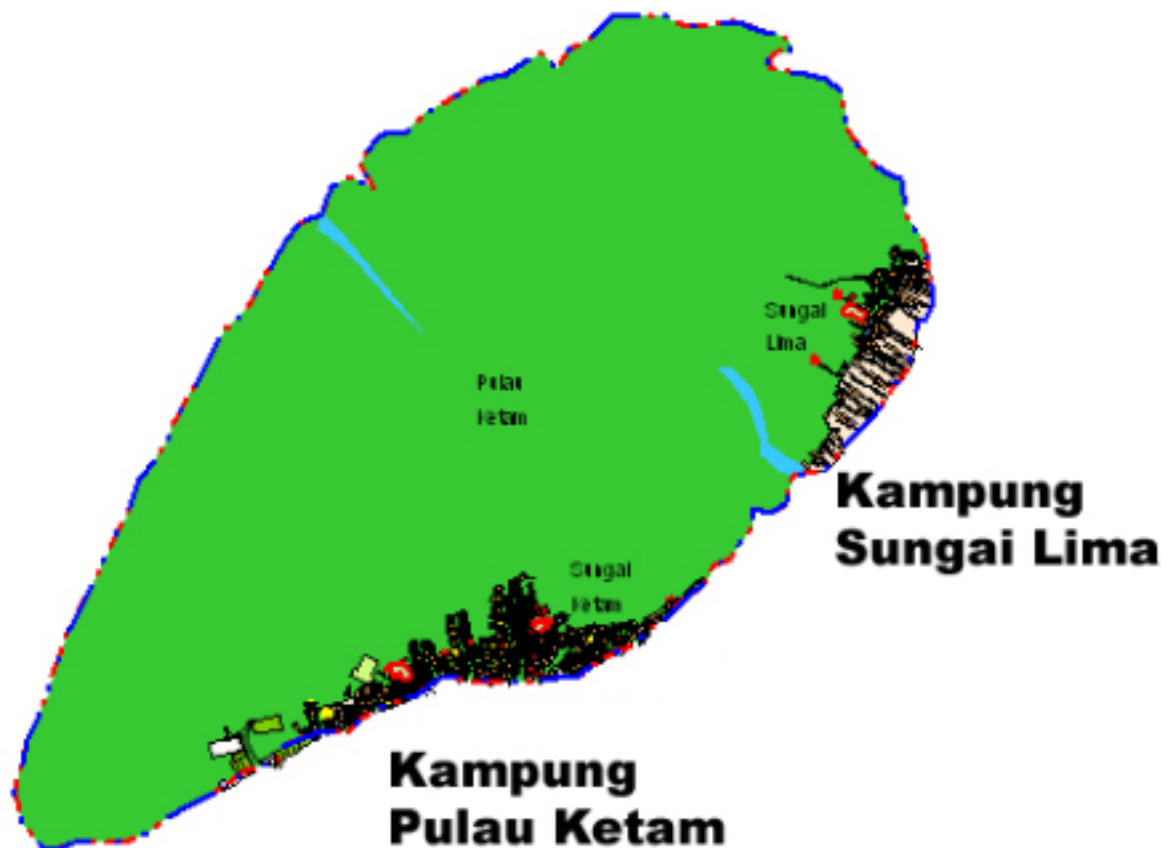


Figure 1.0: Two settlements of Pulau Ketam - Kampung Pulau Ketam (Bagan Teochew) and Kampung Sungai Lima (Bagan Sungai Lima).

Source: pulauketam.com

It can be concluded that the current feasible solutions proposed above are based on the existing notion that settlements in coastal regions such as Pulau Ketam should remain static. Hence, the need to keep raising platform levels and building higher flood barriers becomes another problem in and of itself, such that it will always be subjected to higher water level inundation, as well as creating physical obstruction to the visual continuity of the Pulau Ketam scenery. However, the point of departure of this paper is that the mitigation strategy of Pulau Ketam should start to look towards tide level adaptable solutions and break away from static, preventive or responsive mitigation that might not constitute to the long-term livelihood of the population.

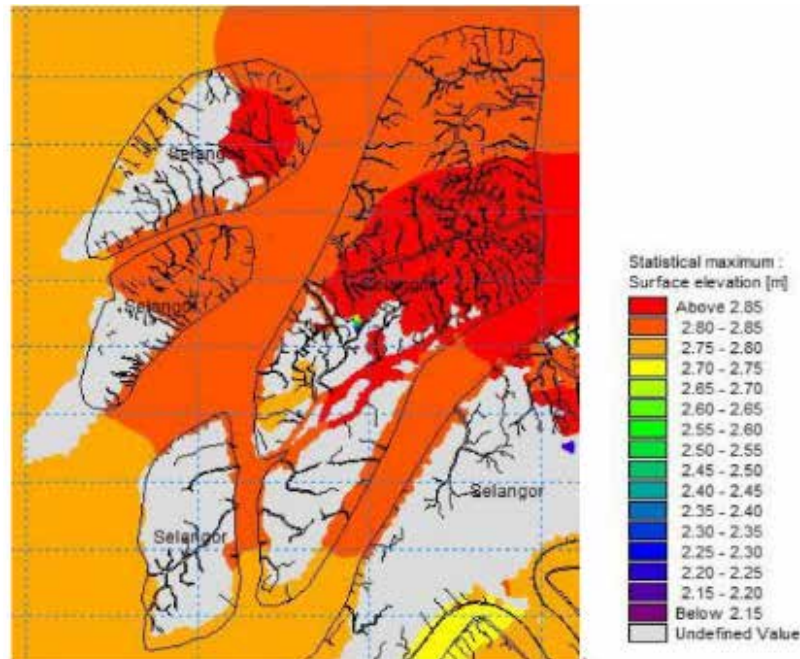


Figure 1.1: Sea Level Rise Projection for year 2100, with the majority of Pulau Ketam (northwest-most island in figure) settlements inundated.

Source: NAHRIM

According to a study by Almutairi et al. (2020), when assessing coastal community resilience (CCR), there are four common dimensions to take into consideration, namely society and economy, environment and climate change, infrastructure, as well as governance and institutions.

Based on the above dimensions, in Pulau Ketam, the tourism and fishery economy are the backbone of the residents' livelihood. However, the increased human activities on the economy dimension will affect the environment dimension in terms of increased coastal pollution, loss of mangrove cover and expose Pulau Ketam in further risk of SLR-related hazards like coastal erosion. The infrastructure dimension plays an important role in mitigating SLR physically, whereas the governance dimension allows regulations to take place for disaster prevention. Resilience is an important goal when preparing coastal communities for natural and human-made disasters, hence it is essential to enhance community resilience by identifying beneficial criteria that will make this possible (Almutairi et al., 2020).

Previous studies indicate that floating structures developed through the last decades concluding that it's the most sustainable solution against sea level rise (SLR), preferring it to land reclamation approaches regarding sustainability, lifespan, and cost-effectiveness (El-Shihy & Ezquiaga, 2019). Floating or amphibious architecture is indeed a flood mitigation method that enables a typically standard structure to rise to the top surface of surging floodwater instead of being submerged (M.V. & Philip, 2022).

However, the current governmental policy of overcoming coastal flooding is through mitigation strategies like constructing flood barriers and raising platform levels (NAHRIM, 2019). In addition, there has been no coastal development in Malaysia that is dynamically adaptive to tide levels.

Malaysia has been slow or non-responsive to adopt floating or amphibious architecture in vulnerable coastal regions. Amphibious technologies are considered more robust than the others as they can tolerate both low and high floods inundation depths and are indifferent with regard to the flood frequency (Nilubon et al., 2016). Nonetheless, none of the coastal developments in Malaysia have adopted floating or amphibious architecture as a long-term solution for sea level rise.

Therefore, this research aims to formulate a framework of strategies and guidelines on how to utilize floating architecture to adapt with sea level rise in coastal communities like Pulau Ketam to sustain coastal economies for the long run.

With that being said, the Main Research Question shall be:

What are the design strategies within floating architecture that can sustain coastal economies in coastal communities vulnerable to sea level rise?

In order to answer the Main Research Question, the following Sub-research Questions are formulated to aid in the process:

Sub RQ 1: What are the problems that affect the livelihood of vulnerable coastal communities in existing coastal developments?

Sub RQ 2: What are the key elements of floating architecture strategies that sustain the coastal economies?

This study will identify a framework on the strategies to improve the existing vulnerable coastal communities through floating architecture.

Objective 1: To identify the problems that affect the livelihood of vulnerable coastal communities in existing coastal developments.

Objective 2: To determine the key elements of floating architecture strategies that sustain the coastal economies.

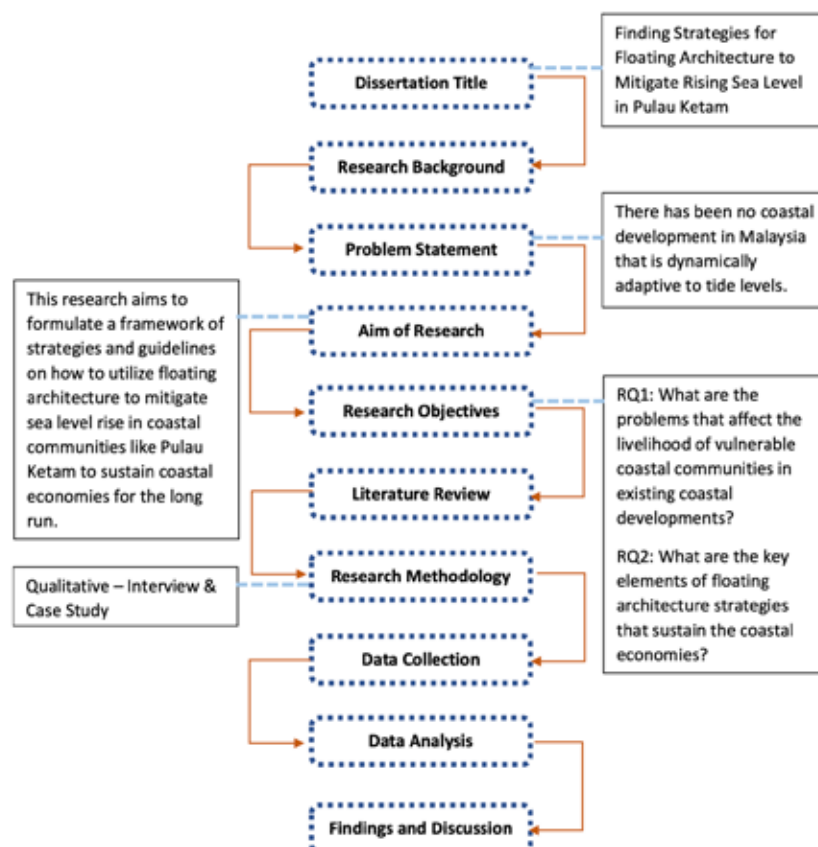


Figure 1.2: Research Framework
Source: author

LITERATURE REVIEW

The Impact of Coastal Developments

With every coastal development, comes its own problems that are caused by human nature. Van Rijn (2011) thought that human activities had intensified coastal erosion. Among the problems are mangrove deterioration, marine litters, marine heavy metal pollution, as well as coastal erosion. Coastal development is one of the factors that may cause decline of the mangrove ecosystems. Development has been increasing each year and mangroves have been cleared to give space for these developments (Ahmad et al., 2019). Pulau Ketam as a mangrove island is not spared from coastal development related mangrove clearing. This results in coastal erosion and can be worsened by sea level rise.

According to Hughes et al. (2017), coral reefs provide essential ecosystem services (i.e. tourism, coastal protection, food and natural products) to millions of people, but are under threat due to multiple human impacts acting at local to global scales. Of increasing concern, however, are the impacts of marine litter, of which plastics are a primary component (Santodomingo et al., 2021). The immediate impacts of macroplastics and other marine litter on reef corals and associated biota are both direct and indirect. Direct impacts include physical damage, substrate covering and entanglement, and gut blockage if items are ingested (Sweet et al., 2019). As a coastal community that relies on fishery, plastic ingestion by marine animals poses a threat to the consumers of Pulau Ketam.

In recent decades, domestic, industrial and other anthropogenic activities have contributed to the increase of heavy metal contamination in the water and have directly influenced aquatic ecosystem (Kaur 2008; Velez & Montoro 1998, as cited in Rosli et al., 2018). According to Abdullah et al. (2020), it is apparent that, in Malaysia, human activities such as over-logging and clear-cutting of mangroves along coastal zones had resulted in the coastline to be exposed to hazards like tidal inundation, storm surges, currents and wave energy (Hashim et al., 2010). However, these studies focus on conventional coastal development problems that are caused by human activities without considering the sensitive shore material composition which needs to be addressed via remediation. Therefore, a different approach of developing the coastal settlements should be looked into.

Floating Architecture

Reality shows that the occupants of floating house survived for decades by relying on their sensory ability to construct their house on unstable surfaces (Puspitasari et al., 2019). The daily experiences of the occupants of floating house are basic human knowledge about how to build a shelter, which is safe from the obstacles due to the behavior of local climate (rain, heat, wind, humidity) and the movement of aquatic surface movement (flow, ripples and waves) (Puspitasari et al., 2019).

According to Kizilova (2019), floating structures have an indisputable advantage over stationary artificial islands, as they are able to withstand the potential rise of the level of the World Ocean. Since 1993, the sea level is increasing by 3.2–3.4 mm per year, to which the vast majority of modern buildings are not yet adapted. Modular structures on floating foundations give architects the opportunity to conduct a primary experiment on the operation of structures in the water environment in a small scale (Kizilova, 2019).

Okeke, F.O., Chukwuali, B.C. and Idoko, A.E.(2019) states that, the basic characteristic of a floating building is that it is not supported by a firm foundation, but floats on water. Traditional foundations are therefore not required. The position of a floating home is permanently fixed in a horizontal direction, while it can flexibly follow vertical variations in water level (Okeke, F.O., Chukwuali, B.C. and Idoko, A.E., 2019). However, these studies have not considered floating architecture that connects to an existing permanent structure for accessibility from the adjacent lands in the local context of their studies. This study will look into the accessibility aspect in the local context of Pulau Ketam.

Vulnerable Coastal Communities

According to Almutairi et al. (2020), human encroachment into narrow coastal land increases the vulnerability of communities to coastal hazards. Furthermore, it is estimated that, due to the increasing rate of urbanization, approximately half of the global population will live in coastal communities in the future (Almutairi et al., 2020). Spellman and Whiting (2006) and Sharif and Yamagata (2016) note that rising sea levels and the increased occurrence of coastal storms necessitate the relocation of communities situated close to shorelines and the establishment of infrastructures further inland (Almutairi et al., 2020).

Ehsan et al. (2019) states that low-lying coastal areas are particularly susceptible to storm surge and flooding, and the effects on communities can be catastrophic. In the future, such effects will be intensified by rising sea levels and may lead to prolonged disruption of economic activities, livelihoods, and long term sustainability of the coastal communities (Ehsan et al., 2019). Sea level rise threatens a significant number of people and assets in coastal areas (Ehsan et al., 2019).

According to Wu et al. (2002), accelerated sea-level rise, increased frequency and intensity of coastal and inland storms, and more riverine flooding because of increased precipitation would exacerbate the already considerable vulnerability of coastal communities to natural hazards (IPCC 2001).

Although the risks faced by urban populations from climate change impacts, especially in low- and middle-income nations, have been acknowledged in various regional assessments, vulnerability cannot be reliably estimated without detailed knowledge of local contexts, since vulnerabilities are so specific to each location and societal context (Adelekan, 2010). Despite many studies that has been done on coastal vulnerabilities on numerous regions around the world, due to its specificity of local context, the results can hardly be replicated or applied to other location. This study agrees that the devised strategies might need modification when replicated in somewhere else other than Pulau Ketam.

METHOD

This study uses the qualitative research method to investigate the research question “What are the design strategies within floating architecture that can sustain coastal economies in coastal communities vulnerable to sea level rise?”. In order to expand on the identified Sub RQs, there are intricate relations and contexts that require an in-depth understanding via interviews.

This study employs the purposive sampling strategy by identifying the suitability and the specificity of the target informants on the subject matter of the interview. By using purposive sampling, the opinion and experience of the informants could be varied in order to obtain information from different perspective and facades. In this study, 3 informants have been selected based on the fulfilment of 3 respective criteria of livelihood in Pulau Ketam, namely fishery (fisherman), tourism (homestay owner) and retail (restaurant owner) industry. However, they also have other side businesses that they maintain.

The relevant data are collected via face-to-face interviews. The interviews are conducted in a semi-structured format with a brief introduction on the nature of the study and the general theme and direction for the interview. The questions are open-ended in order to encourage detailed answers and prompts for further probing questions specific to each of the 3 occupational industries of which the informants depend on for livelihood in Pulau Ketam. This also allows for a two-way conversational style of the interview to encourage honest and heartfelt opinions from the interviewees.

Due to the sociocultural setting of Pulau Ketam (dominated by the Chinese ethnic of Teochew descent), all of the 3 interviews were conducted in Mandarin, recorded, transcribed and later translated to English post-interview. Utmost care was given during this process to retain as much of the original meaning as possible to mitigate the problem of meanings lost in translation. Some of the sentences that are structured differently in Mandarin are occasionally restructured with brackets when translated into English in this study for the purpose of retaining information without altering their intended meanings.

All of the interviews were recorded and played back post-interview for transcription. The qualitative data analysis software Atlas.ti was used to analyze the transcriptions and to identify the relevant codings to formulate the final themes as shown in the Thematic Analysis Matrix (refer Table 3.4.1 & 3.4.2).

For the purpose of privacy and anonymity, the names of the interviewees have been intentionally left out. They will be referred to in this study with their corresponding pseudonyms as indicated in Table 3.5.1.

Table 3.4.1: Thematic Analysis Matrix for Sub RQ 1

Source: author

Main RQ: What are the design strategies within floating architecture that can sustain coastal economies in coastal communities vulnerable to sea level rise? Aim of research: This research aims to formulate a framework of strategies and guidelines on how to utilize floating architecture to mitigate sea level rise in coastal communities like Pulau Ketam to sustain coastal economies for the long run. Informants: • 1 Pulau Ketam Fisherman • 2 Pulau Ketam Business Owners (Homestay Business & Restaurant Business)					
Research Questions	Deductive codes	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
Sub RQ 1 What are the problems that affect the livelihood of vulnerable coastal communities in existing coastal developments?	• Problems • Vulnerable coastal communities • Coastal development	• In-depth interview • Literature review	IQ1: Have you experienced flood due to sea level rise and what are the effects of it? a. What are the environmental changes that you notice in the recent years? IQ2: What do you think about mangrove clearing during coastal development that can exacerbate the effects of sea level rise, like coastal erosion? IQ3: What is your opinion on improper solid waste disposal around the island as well as direct discharge of wastewater into the sea and their impact on the ecosystem?	Problems • Unpredictable flooding • Warmer climate • Building sinking • Raising building levels • Financial loss Vulnerable coastal communities • Frequent mangrove clearing • Soil erosion • Building relocation Coastal development • Littering habit • Washed-up wastes • Managing wastewater • Loss of wildlife • Preservation policies • Restoration initiatives	Theme 1: Climate change induced hazards • Warmer climate • Unpredictable flooding • Building sinking • Financial loss Theme 2: Reckless human activity and its consequences • Frequent mangrove clearing • Littering habit • Soil erosion • Washed-up wastes • Loss of wildlife Theme 3: Coastal conservation • Raising building levels • Building relocation • Preservation policies • Restoration initiatives • Managing wastewater

Table 3.4.2: Thematic Analysis Matrix for Sub RQ 2

Source: author

Main RQ: What are the design strategies within floating architecture that can sustain coastal economies in coastal communities vulnerable to sea level rise? Aim of research: This research aims to formulate a framework of strategies and guidelines on how to utilize floating architecture to mitigate sea level rise in coastal communities like Pulau Ketam to sustain coastal economies for the long run. Informants: • 1 Pulau Ketam Fisherman • 2 Pulau Ketam Business Owners (Homestay Business & Restaurant Business)					
Research Questions	Deductive codes	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
Sub RQ 2 What are the key elements of floating architecture strategies that sustain the coastal economies?	• Floating architecture strategies • Coastal economies	• Case study research • In-depth interview • Literature review	IQ1: What is your opinion on floating structures or architecture in Pulau Ketam? a. What factors would allow long term living on floating structures? b. Are there examples of long term floating structures in Pulau Ketam and how do they sustain? IQ2: What are the most prominent economic sectors in Pulau Ketam in your experience? a. Why have you chosen your current job? b. What are the necessary elements of your job? c. Who are the target group of your business? IQ3: What are the specific phenomena of Pulau Ketam that may further drive or deteriorate the local economies? a. Are there specialties in Pulau Ketam that have to be preserved to sustain the local economies? b. What are the socioeconomic necessities to sustain a coastal community?	Floating architecture • Urgency awareness • Accessibility • Motion stability • Functionality • Economic integration Coastal economies • Profitability • Seasonality • Marketability • Maintenance • Cultural promotion • Tourism • Locality • Greying population • Heritage preservation • Healthcare access • Social safety • Community cooperation • Governmental policies	Theme 4: Floating architecture considerations • Accessibility • Motion stability • Functionality • Economic integration Theme 5: Community awareness education • Urgency awareness • Greying population • Heritage preservation • Community cooperation • Social safety Theme 6: Socioeconomic development • Profitability • Seasonality • Marketability • Maintenance • Cultural promotion • Tourism • Locality • Healthcare access • Governmental policies

Table 3.5.1: Informant selection through purposive sampling

Informant Pseudonym	Main Business Sector	Other Business Sectors Involved	Date of Interview	Transcribed and translated
Pulau Ketam Restaurant Owner	Retail (Restaurant)	Karaoke/ Entertainment	15 April 2023	Yes
Pulau Ketam Fisherman	Fishery	Grilled and frozen seafood	16 April 2023	Yes
Pulau Ketam Homestay Owner	Homestay (B&B)	Salon, Snacks & Beverage, Sundry Shop	16 April 2023	Yes

Source: author

RESULT AND DISCUSSION

This section presents the findings from the in-depth interview conducted for this research. The interview focuses on the awareness of the adverse impacts of sea level rise on the economic livelihood of Pulau Ketam, which is a developed mangrove island facing a set of internal and external problems, and how a strategised floating architecture could carefully navigate around it to mitigate these effects. Therefore, this section will be split into the relevant themes that are obtained from the data collected in order to give a coherent narration to the issue.

Climate Change Hazard Awareness

When asked about the awareness and experience of climate change induced flooding (sea level rise), all 3 respondents are either aware via secondhand accounts or have personally experienced flood in Pulau Ketam. 1 of them have personally experienced financial (property) damages due to sea level rise flooding.

“When the flood happened, we have to air and dry some of the things that got wet, like mattresses. Some things that can be moved higher will be placed higher temporarily during the flood. Some other things that are not salvageable after the flood will be thrown away. But most houses now are built higher already.”

-Pulau Ketam Restaurant Owner

Reckless Human Activity and Its Consequences

On the topic of coastal development related mangrove clearing, all 3 of them are not aware of the harm and 1 of them perceive mangrove plants as an unwanted element that requires regular clearing.

“Actually, sometimes we find the mangroves/wild plants grow too much around our compounds and we will pay someone to clear them every 2 months.”

-Pulau Ketam Restaurant Owner

1 of them noted a change in terrain and attributed it to possible coastal erosion. When asked about the littering issue and solid wastes found on the island, 1 of them acknowledged the issue and highlights the environmental effort that he is involved in, while the other 2 interviewees felt that it is not entirely their fault. 1 of them has noted a decline in marine harvest but did not attribute it to solid waste pollution. 1 of them also noted that direct wastewater and sewage discharge into the sea, currently still practiced in Pulau Ketam, is a legacy that have not been replaced by other solutions.

“Yes, all our wastewater and sewage are discharged directly into the sea. We have been doing it since the beginning. Not sure how else would we discharge them. As for marine life loss, I’m not so sure about that.”

-Pulau Ketam Restaurant Owner

Coastal Conservation Efforts

In order to mitigate sea level rise and conserve the coastal settlement, the local strategy was to renovate and raise the houses to a higher level. The residents of Pulau Ketam have put in effort to relocate/rebuild some of the important coastal buildings inundated by flood, as stated by 1 of the interviewees. There is also the retreat strategy (moving inwards) being employed over the years.

“Yes. In the past, the houses can extend even more outward to the sea. Now the water level forces everyone to keep moving inward. The terrain keeps changing. 60 years ago, the terrain was different.”

-Pulau Ketam Fisherman

When asked about the conservative actions on coastal pollution, 1 of the interviewees stated their initiative.

“Yes. We have also now organized a cleaning activity to clean up the trash on the island.”

-Pulau Ketam Fisherman

Aspects to Consider in Floating Architecture

Practicality of Floating Architecture

In terms of the suitability of floating architecture in Pulau Ketam, all 3 of them have stated that the existence of floating architecture is not a very distant topic to them and that it can work in Pulau Ketam.

“I think it is not unusual to stay on water. We have fish farms that are floating like this independently, fixed by anchors thrown into the seabed.”

-Pulau Ketam Fisherman

“There’s quite some number of floating facilities like fish farms around here. You can take a boat out to see them. There’s also some eagle feeding activity in the middle of the sea that you can participate in.”

-Pulau Ketam Restaurant Owner

When asked about their opinion and willingness to live on floating architecture, 2 of them have responded that it depends on the necessity for such a change and on the practicality in terms of the functionality, accessibility and stability.

“These buildings mainly serve for its purpose only which is to let the people who rear fish to stay on there. I’d say most of the other residents have not found a reason or urgency to stay like this. If one day the whole island is flooded, then these buildings are definitely a solution.”

-Pulau Ketam Fisherman

“It would depend on how convenient it is to access such structures... From what I know the movement of the structure is not very intense so it does not induce seasickness. Also, the platforms are large, so there is not much movement felt. But such places are quite traditional and does not have air conditioning so it can be quite hot in this weather.”

-Pulau Ketam Homestay Owner

Economic Integration

1 of the interviewees stated that the preference of living on floating architecture depends on whether his business could be maintained as well. 2 of them noted that the livelihood of floating architecture very much depends on economic integration to sustain.

“It depends. We are technically already living at the sea, just that we are not completely floating. Some of us have businesses that are on the island, so that needs to be addressed.”

-Pulau Ketam Restaurant Owner

Community Awareness Education

On the topic of community awareness, 1 of them stated the importance of education on civic mindedness and taking accountability for cleanliness. All 3 interviewees mentioned about their awareness of the greying population that might affect the sustainability of their livelihood.

“Definitely. Our population is declining. 20 years ago, we have around 20,000 people but now there’s only around 5-6000 old people and kids. There are very little middle aged/ young adults who still stay here permanently. Those who can afford to leave here have left, and some businesses are still maintained by the older generations.”

-Pulau Ketam Restaurant Owner

1 interviewee highlighted that there is a heightened community spirit and cooperation that exists within Pulau Ketam. 1 of them also emphasized on the respectable social safety within the island. 1 of the interviewees stated that the heritage of Pulau Ketam should be preserved.

“The buildings have changed a lot. But the heritages and traditions have to be remained. Some of the buildings with remarkable history should be remained.”

-Pulau Ketam Homestay Owner

Socioeconomic Development and Necessities

Tourism

1 interviewee noted that the greying population of Pulau Ketam is not particularly helpful during the boom of tourists in this region. 2 of the interviewees opined that one of the main economic drivers of Pulau Ketam is tourism.

“Back then it was way better due to the large local population. Now that most younger generations have left Pulau Ketam, we have to rely on tourists or people from other places to sustain some of our business sectors here.”

-Pulau Ketam Homestay Owner

Profitability

2 of the interviewees see the profitability of their business as the main reason of their livelihood.

Seasonality

In terms of the fishery industry, the factor of seasonality is being mentioned by 1 of the interviewees that affects his business.

Marketability

There is an element of competitiveness in the marketability of the tourism related business as mentioned by 1 of the interviewees.

Maintenance

For 1 of the interviewees, maintenance is key when operating multiple businesses, however the local workforce in Pulau Ketam is not sufficient.

Cultural promotion

1 interviewee mentioned that cultural promotions can help Pulau Ketam gain more exposure and attract people.

Locality

1 interviewee stated that Pulau Ketam is a specialty name for fresh seafood within the Klang region. Besides, as reported by 1 of the interviewees, Pulau Ketam is very special in that there are no cars on the streets. 2 of the interviewees mentioned that the uniqueness of the island itself when it comes to lifestyle, is something attractive for people from outside of Pulau Ketam.

“Definitely the first thing that comes to my mind is seafood. One of the freshest that you can find around Klang region. Besides, most people come here to experience the slow life, so you could count that as an attraction too.”

-Pulau Ketam Fisherman

Healthcare access

2 of the interviewees have mentioned about the necessity of basic healthcare within the island that helps them cope with minor illnesses. However, Major illnesses will have to be referred to hospitals at mainland Klang.

Governmental policies

2 of the interviewees have mentioned about the nature of temporary ownership of their buildings in the island as the ongoing policy in their village.

“There are no land grants here. We pay rent to the government. The residents apply for a particular location on island and then it will have to be approved before construction.”

-Pulau Ketam Fisherman

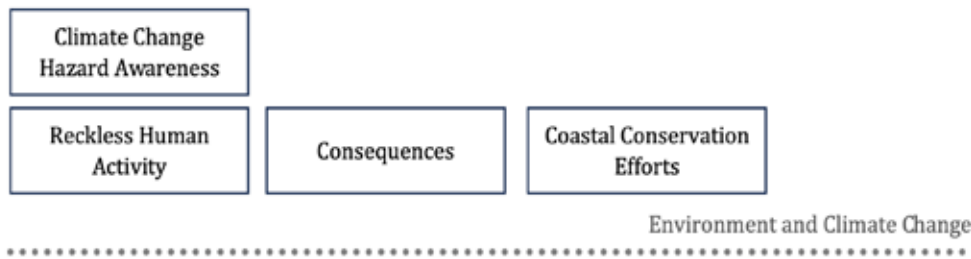
DISCUSSION

Based on the results obtained, it can be derived that the locals of Pulau Ketam are very much aware of the climate change that causes a series of hazards like sea level rise and property loss or damage due to flooding. Due to the nature of Pulau Ketam as a mangrove island, the mangrove trees have acted as a buffer that protects the existing settlements from strong current and waves, such as tsunami. However, there is a low awareness among the locals with regards to mangrove trees as an important natural element not only for coastal resilience but also as a habitat for native species. As such, it has been reported that the ecosystem around the island has changed significantly over the years, as well as erosions that have happened which altered the shoreline. The mangrove clearing occurs whenever there is development on the island, as well as during regular maintenance of mangrove growth around the house. Besides, a lack of civic-mindedness has caused littering around the island, exacerbated by the tourists as well. The combined factors of polluted barren mud around the settlement and constant mangrove clearing could have also worsen the ability of the island to defend against seawater surges, prompting the locals to relocate inwards and raise their houses higher over the years, in an effort to conserve the coastal settlements.

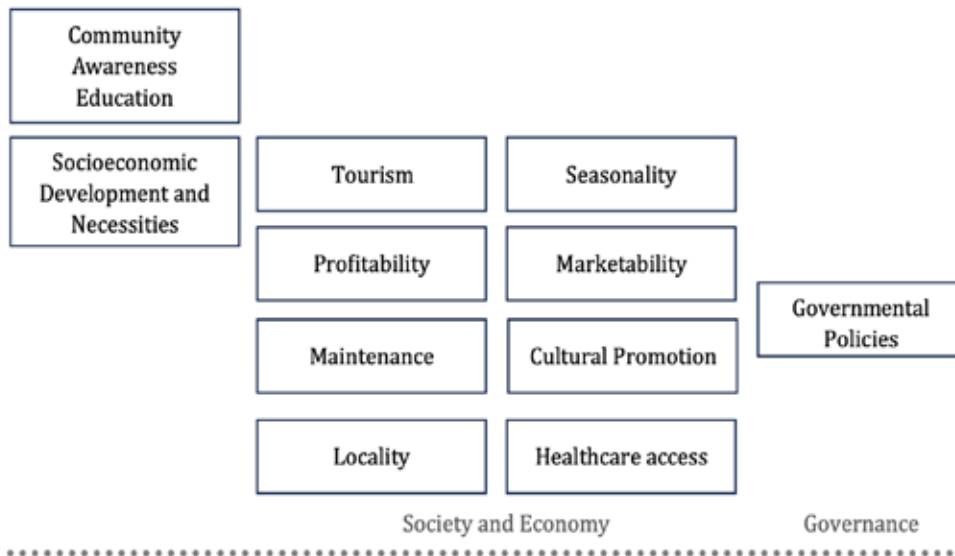
However, the status quo of relocating inward and raising platform levels to combat rising sea levels is not a permanent solution, as it is an act of retreat and not embracing the unavoidable. Hence, when provided with the idea of living afloat on water with the implementation of floating architecture, the locals are not unfamiliar with it, citing the fact that there are existing structures that cater to a particular economic activity, which are the fish farms. The locals are not averse to living afloat permanently, but are concerned with addressing the innate part of their livelihood, which is economic integration, in order to make the floating architecture sustainable in the long run. With proper economic integration within the new floating architecture, the locals no longer have to rely on the existing retail buildings in the island for livelihood. Besides, they are also able to maintain the floating structures with the earned income.

Categorized as a tourism island, Pulau Ketam relies heavily on tourists to drive the economy. This is partially also due to the fact that there is significant local population reduction and greying in the island. Hence, when devising a floating architecture strategy, it is important to consider the socioeconomic development and necessities of the island. When it comes to economic sustainability, the locals tend to venture into more profitable business sectors, such as homestay or B&B businesses. The existing businesses in the fishery industry have also started to cater to tourists by selling frozen processed seafood. Due to the nature of coastal settlements, the fishery industry is also heavily affected by seasonality, which includes varying tides, marine species, etc. Hence, a monotonous business mode is not ideal, which prompted most of the locals to take up multiple businesses as a means to sustain through the years. When it comes to exposure of the island, the locals are active in promoting cultures such as organizing art festivals, in hopes to attract more people into the island. The existence of healthcare access and implementation of beneficial policies are also paramount to the flourishing of coastal settlements like Pulau Ketam. All in all, the locals also take pride in staying true to the locality of the island, which includes the fresh seafood as well as the laid-back environment. Hence, it is important to consider such factors when devising a strategy for floating architecture to sustain the livelihood of Pulau Ketam amidst sea level rise.

Identifying the problems



Understanding the local context



Designing the solution

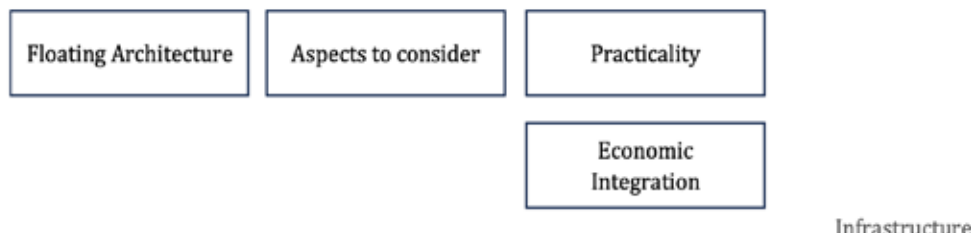


Figure 4.0: Framework of floating architecture design strategies
Source: author

CONCLUSION

In conclusion, the residents of Pulau Ketam are aware of the impact of climate change and the importance of mangroves for coastal resilience. However, there is a lack of awareness about mangroves as wave buffers and habitats for native species, leading to significant ecosystem changes and shoreline erosion. The clearing of mangroves for development and maintenance, along with littering, has further degraded the environment. The current practice of relocating and elevating houses is a temporary solution in the event of sea level rise. Fortunately, the idea of living on floating architecture is not new to the locals, but the consensus of the locals is that economic integration is crucial for long-term sustainability of such structures. Tourism plays a vital role in the island's economy, and diverse business approaches are necessary due to the seasonal nature of the fishery industry. The locals actively promote the island's culture and also rely on accessible healthcare and beneficial policies to flourish. Considering these factors, a floating architecture strategy should prioritize economic opportunities, cultural preservation, and sustainable livelihoods to effectively mitigate sea level rise in Pulau Ketam without neglecting the needs of the locals.

ACKNOWLEDGEMENT

The author would like to express gratitude to the informants of Pulau Ketam for their sincerity and willingness to consent to the interviews.

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FLOOD RESILIENCE STRATEGIES OF RELIEF SHELTER AT FLOOD-PRONE REGION IN KOTA BAHRU.

Amanda Wong Su Ling, Wan Srihani Wan Mohamed,

ABSTRACT

Flood is the most significant natural hazard in Malaysia that cause nearly every year. This resulting the people have been evacuated to relief shelters. The situation at relief shelters makes it difficult for the victim to change clothes and there is no privacy, especially when it involves men and women. Besides, Astro awani's survey also found that some of the victims were forced to huddle due to the state of the school classrooms which have not yet been fully arranged. Currently, there is a lack of facilities and inappropriate shelter for the flood victim hence there is a need to revise flood-resilient strategies for relief shelter for the future community in Kota Bahru. Therefore, this research will focus on how NGOs/ NADMA decide on providing suitable flood-resilient strategies for the relief shelters that can respond effectively in all flood-prone areas for the community at Kota Bahru. This research will conduct qualitative research through the depth interview, and desk review. This research will formulate suitable flood resilience strategies on relief shelter for the community that can be applied overall in Kota Bahru. This study will contribute a better method and long-term solution to help the government, NGOs, and the community in Kota Bahru. Future research can explore more flood-resilient strategies in other shelters that can be applied at the Kota Bahru for the local community.

Keywords: Flood, flood-resilient strategies, relief shelters.

INTRODUCTION

The study conducted by Abid et al. (2021) sheds light on the urgent need for the Malaysian government to incorporate international disaster risk reduction (DRR) strategies into its national policy framework. The impacts of climate change, particularly floods, have severely affected various regions of the country, hindering socioeconomic growth and sustainable development. Flood-prone areas, such as floodplains and deltas, are particularly vulnerable, as they provide favorable conditions for habitation and economic activities but also face the constant threat of natural disasters. This necessitates the adoption of proactive measures to address flood risks and enhance resilience.

One key finding is the correlation between economic growth and increased flood risks. As economic development progresses, investments and property values rise, resulting in higher potential damages in the event of a flood. Traditional flood control measures, such as raising dikes and building embankments, may inadvertently increase the risks by altering flood patterns and exacerbating potential flood depths. This was evident during the severe floods in Sri Muda Shah Alam in November 2022, where heavy rains led to tragic consequences. It is crucial to strike a balance between economic development and effective flood risk management to ensure the well-being and safety of communities.

The study highlights the importance of integrating disaster risk reduction (DRR) into national and local policies and strategies, aligning with the United Nations International Strategy for Disaster Reduction (UNISDR) recommendations. Collaboration between states, local authorities, and communities is essential for developing and implementing comprehensive DRR policies that reduce vulnerabilities, hazards, and the unfolding impacts of disasters. Local knowledge and practices play a vital role in disaster resilience, and it is crucial to involve and empower disadvantaged communities in the decision-making process.

Efforts to mitigate flood risks have historically focused on river training and embankment construction. However, alternative approaches that focus on minimizing the effects of flooding and adopting resilience strategies have gained recognition. These strategies emphasize risk

management rather than hazard control and often involve adapting land use to mitigate negative impacts. Effective disaster risk reduction policies require coordination among various authorities, including military and civil protection agencies. However, it is essential to address concerns regarding top-down approaches and foster trust between policymakers and local communities to ensure inclusivity and the incorporation of local knowledge.

The vulnerability of communities to floods and the damages incurred by both infrastructure and personal property further highlight the need for comprehensive flood resilience measures. Inadequate facilities and limited resources at evacuation centers pose challenges for affected individuals, compromising their privacy, comfort, and well-being. The government should prioritize providing sufficient amenities, such as beds, pillows, blankets, restrooms, and private spaces, to ensure the safety and dignity of those seeking shelter during floods. Proper infrastructure maintenance, including telecommunication, water supply, power supply, roads, and drainage systems, is crucial for minimizing damage and facilitating post-flood recovery.

The research gap identified in previous studies calls for the development of flood resilience measures specifically tailored to relief shelters in Kota Bharu. By focusing on architectural design framework and incorporating local knowledge, this study aims to improve the flood resistance and effectiveness of relief shelters. The findings will provide valuable insights for both the Kota Bharu community and government and non-governmental organizations in Malaysia. Implementing the recommendations derived from this research can enhance flood resilience plans, relief shelters, and overall disaster response and recovery efforts, ensuring the safety and well-being of the affected populations in Kota Bharu and beyond.

This study has significantly benefited both governmental organisations like NADMA and non-governmental organisations like Mercy. Policymakers and other stakeholders can benefit from the study's conclusions by creating improved building and material standards for emergency shelters. As a result, it will be possible to guarantee that the emergency shelters have high-quality building standards and materials that effectively reduce the threats that Kota Bahru's flooding poses. As a result, disaster response and relief activities would be more effective and efficient, lessening the impact of floods on the impacted populations. The Kota Bahru community, as well as governmental and non-governmental organisations in Malaysia, stand to gain significantly from this research as it offers insights and recommendations that might enhance flood resilience plans and relief shelters in the area.

LITERATURE REVIEW

Flood resilience is crucial for flood-affected individuals and communities to prevent, endure, and recover from flooding disasters. It encompasses a range of actions such as physical infrastructure, community mobilization, and individual preparedness. However, Malaysia faces challenges in human and institutional resilience, including a lack of awareness and preparedness among locals. There is a need to build resilience by implementing both structural and non-structural flood mitigation methods and improving disaster risk management.

Flood resilience is closely linked to the Sustainable Development Goals (SDGs) set by the United Nations. SDG 11 focuses on creating inclusive, secure, resilient, and sustainable cities and human settlements, while SDG 13 emphasizes taking immediate action to prevent climate change and its effects, including floods. Achieving flood resilience requires a comprehensive strategy that considers environmental, social, economic, and physical elements. It involves resilient infrastructure development, robust urban design, improved social and economic resilience, and ecosystem preservation and restoration.

Measures to reduce flood risks include both structural and non-structural approaches. Structural measures involve physical infrastructure such as barriers, flood walls, and drainage systems. Non-structural measures include laws, regulations, and education aimed at raising awareness and promoting behavior change related to flood risk. A multidisciplinary approach involving various stakeholders is necessary for effective flood risk reduction. Incorporating cutting-edge technology and innovative practices is important for long-term sustainability in reducing vulnerability to floods.

The study emphasizes the importance of factors such as self-efficacy, coping mechanisms, sense of community, and social support in determining the resilience of flood victims. Enhancing these characteristics can increase the resilience of individuals and communities. Providing emotional and informational support, along with material assistance and social connections, can aid in the recovery and well-being of flood victims. Community networks and social cohesion play a vital role in building resilience to floods and other disasters.

The theoretical framework on flood resilient strategies for relief shelters highlights the need to assess public spaces based on minimal shelter design requirements. This assessment considers factors such as layout, location, accessibility to essential necessities, and inclusivity for people with disabilities. Design principles that optimize public space utilization and consider spatial quality and human senses are crucial for the well-being of flood victims. Effective management of evacuation centers is also essential, as many existing facilities are ill-prepared to handle flood disasters.

In summary, building flood resilience is essential for flood-affected individuals and communities. It involves addressing challenges related to awareness, preparedness, and infrastructure. The Sustainable Development Goals provide a framework for integrating flood resilience into broader development objectives. The implementation of structural and non-structural measures, along with community engagement and support, is crucial for reducing flood risks. Additionally, attention should be given to the design and management of relief shelters to provide effective support to flood victims. Further research is needed to develop more comprehensive strategies for flood resilience in relief shelter settings.

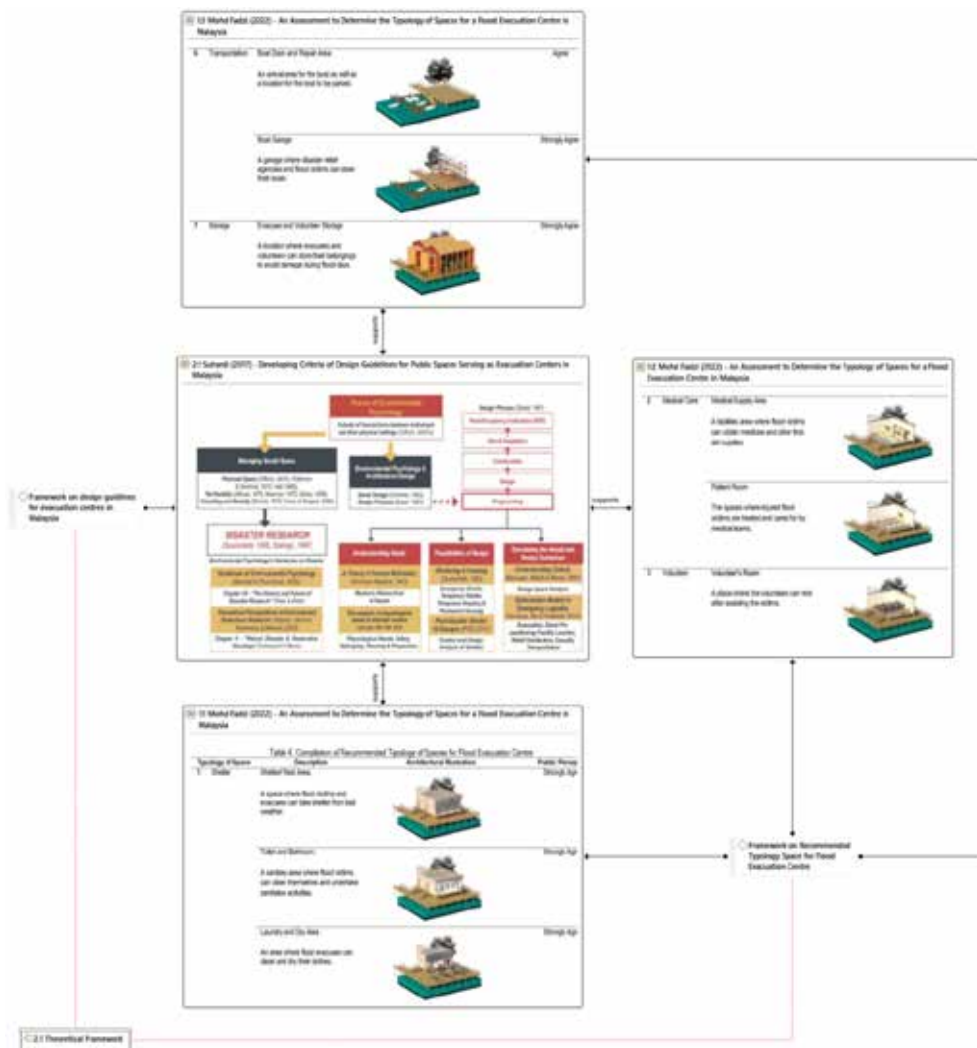


Figure.2.0 Theoretical framework on flood resilient strategies of relief shelter
Source: Author

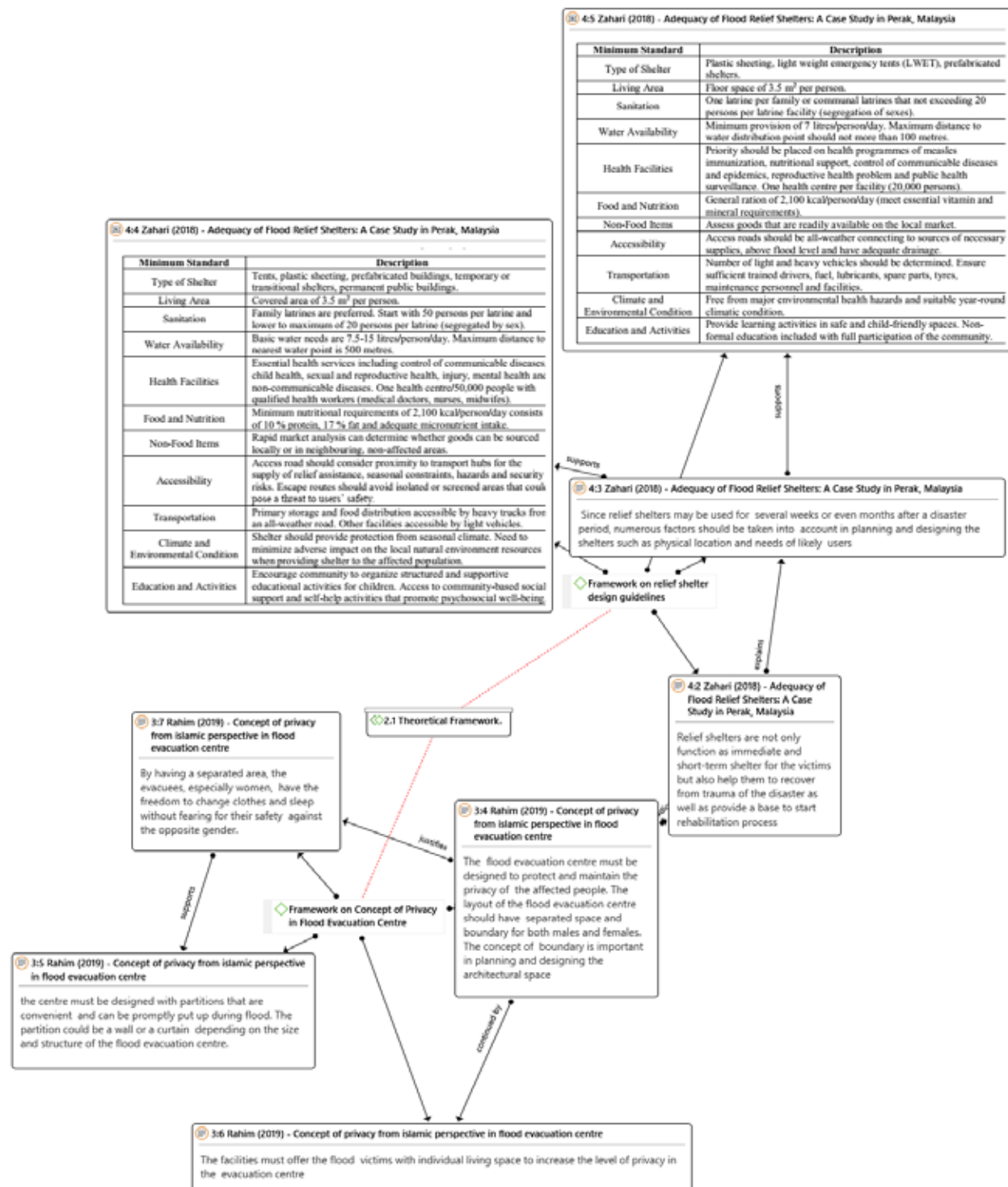


Figure.2.1 Theoretical framework on flood resilient strategies of relief shelter
Source: Author

Flood resilient design, material use, and construction techniques are crucial in addressing the challenges posed by floods. Structures need to be developed with flood resilience in mind, employing materials that can withstand flood events and designing them to recover quickly. Additionally, novel approaches like amphibious buildings and eco-friendly design principles have been proposed to tackle environmental issues in flood-prone areas, taking into account the social, cultural, and religious aspects of architectural blueprints. Cost-effective solutions using locally available materials are essential to ensure that flood-resistant housing is accessible to all, including those with low incomes.

Urban flood resilience and risk reduction strategies play a significant role in mitigating the impacts of floods on cities and communities. These strategies involve comprehensive measures such as land-use planning, early warning systems, and flood protection infrastructure to reduce the likelihood of flood events and minimize their effects. Interactive 3D urban design platforms and rule-based modeling have emerged as valuable tools for improving decision-making processes, enabling designers and urban planners to create resilient designs that consider potential flood risks. Resilience-based strategies promote adaptive measures that coexist with floods, fostering environmental adaptation and enhancing the long-term viability of flood risk reduction initiatives.

At the neighborhood level, flood resilience can be achieved through effective neighborhood planning. Incorporating urban design, green infrastructure, and stormwater management techniques can help reduce flood risk in communities. Design elements such as permeable surfaces, green roofs, and emergency response plans contribute to community resilience and overall social well-being. It is crucial to involve stakeholders and consider the local environment during the planning process to create flood-resistant neighborhoods that address the specific needs and values of the community.

In exploring international practices, the concept of amphibious houses has gained attention as a flood-resistant housing solution. These houses are designed to coexist with water by utilizing buoyancy principles, allowing them to float during flood events. By using lightweight materials and buoyant foundations, the structures can adapt to fluctuating water levels. However, further research is needed to identify practical flood resilience measures specifically for relief shelters. It is important to study and develop comprehensive instructions and resources that address the unique challenges faced by relief shelters in flood-prone areas, ensuring their resilience and effectiveness in providing safety and support during flood events.

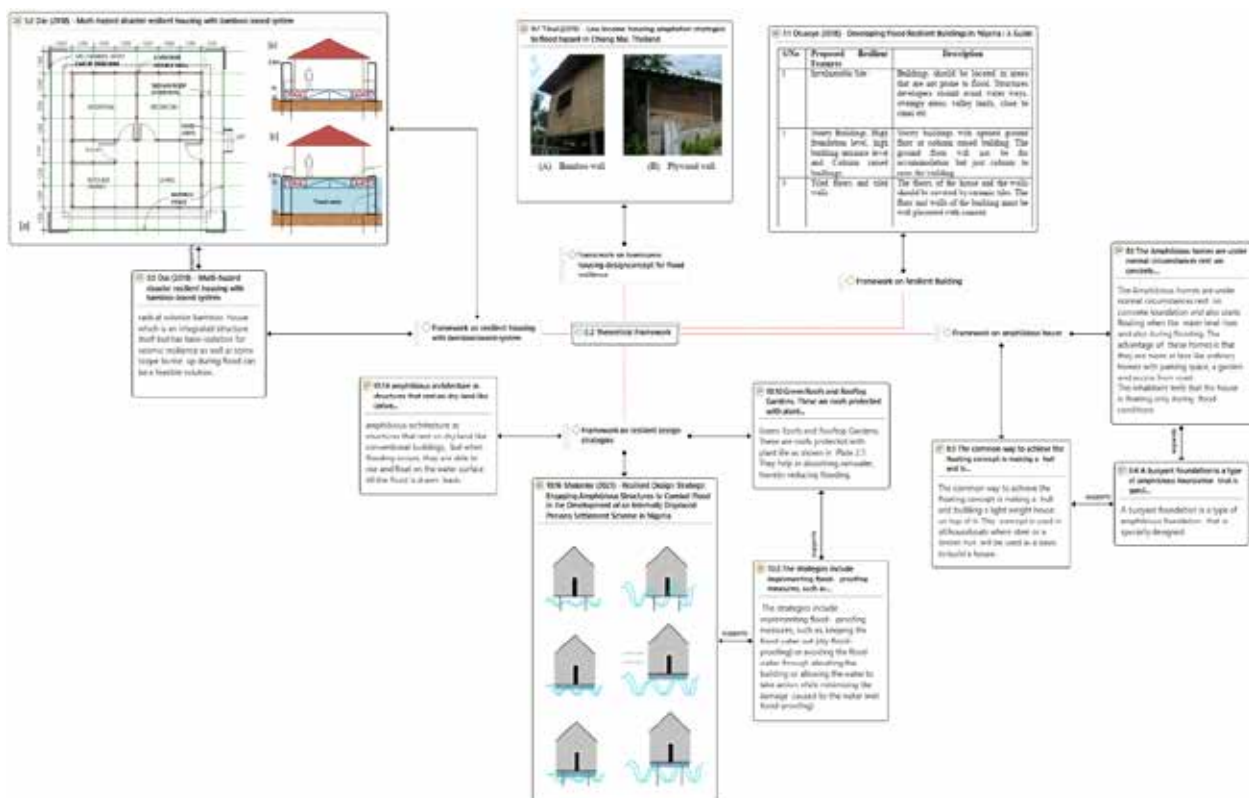


Figure.2.2 Theoretical framework on the international practices of flood resilient strategies of relief shelter.

Source: Author

METHOD

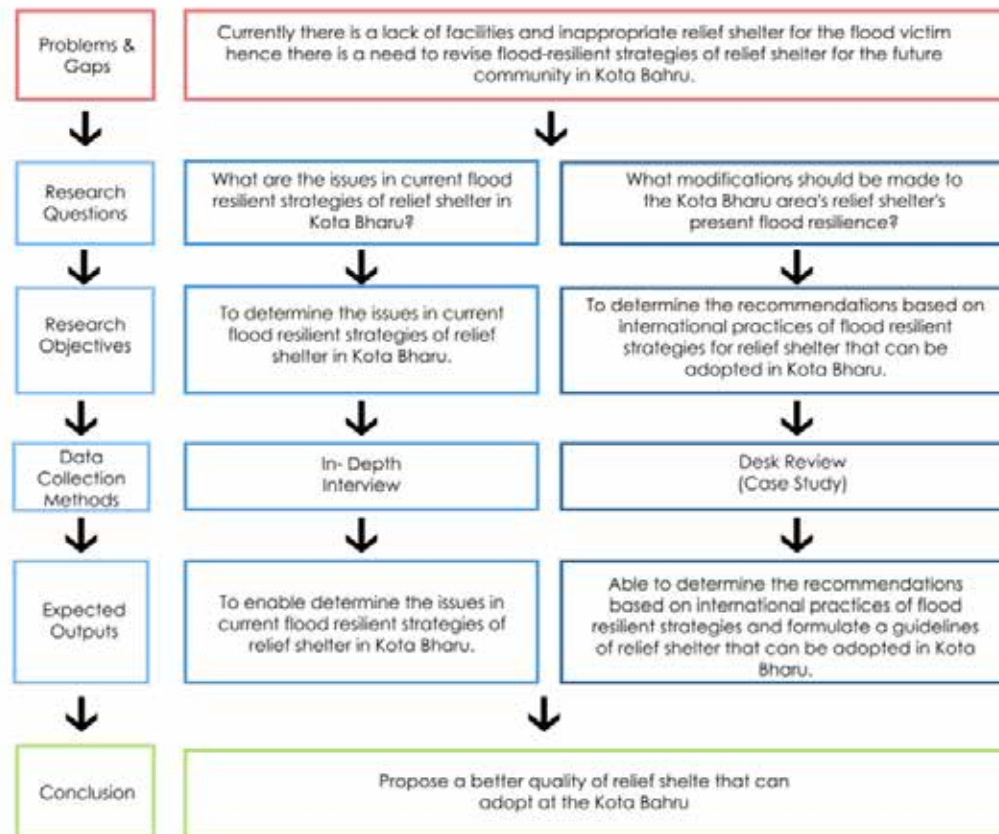


Figure.3.0 Data Collection Framework

Source: Author

This research focuses on individuals who have expertise and experience in managing relief shelters in flood-prone areas of Kota Bharu. To ensure that the sample represents individuals who can provide valuable insights and information, purposive sampling is employed. This sampling technique enables the selection of participants based on specific characteristics or expertise relevant to the research topic. By using purposive sampling, the study aims to capture a targeted and focused perspective that aligns with the research objectives.

A qualitative research design is employed in this study to understand the most effective flood-resilient tactics for relief shelters in all flood-prone locations within the Kota Bharu community. The research question is addressed through in-depth interviews conducted with three informants: representatives from the Kelantan State Civil Defence Force (JKMNK), the non-governmental organization (NGO) Mercy, and the National Disaster Management Agency (NADMA). These informants, who have been involved in flood relief shelter operations, can provide valuable insights and information on sensitive topics.

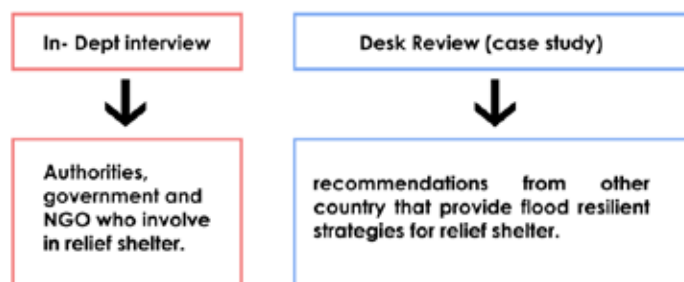


Figure.3.1 Data Collection Method Used

Source: Author

For research question 1, in-depth interviews serve as the data collection approach or instrument. These interviews aim determine the issues in current flood resilient strategies of relief shelter in Kota Bharu.

To address research question 2, a desk review data collection method is utilized. This involves examining existing literature, reports, and relevant documents to gather information and insights related to the research topic. The desk review focuses on selecting case studies that closely align with the criteria and context of Kota Bharu. By analyzing these desk review, the research aims to identify similarities, patterns, and relevant strategies that have been implemented in similar contexts. The findings from the desk review will contribute to a comprehensive understanding of flood-resilient strategies and inform recommendations specifically tailored to the context of Kota Bharu. The desk review serves as a valuable source of secondary data, providing a broader perspective and facilitating a comprehensive analysis of flood-resilient strategies beyond the specific context of Kota Bharu. The included case studies offer practical examples and lessons that can be applied to enhance flood resilience strategies in Kota Bharu.

RESULT AND DICUSSION

Table.4.0 *Thematic Analysis*

Main Research Question: How NGOs/ government decide on on applying suitable flood-resilient strategies for the relief shelters that responds effectively in flood-prone areas for the community in Kota Bahru?

Aim of research: The formulate a design framework on designing a suitable flood-resilient strategies of relief shelter that can respond effectively in term of design/ architecture at flood-prone areas in Kota Bahru.

Informants:NGOs (MERCY), Government (NADMA), (MPKBRI) Local Authority Kelantan.

Sub Research Questions	Deductive codes / Theories	Strategy of inquiry	Inductive codes Coding	Final theme
Sub RQ 1: What are the current flood resilient strategies for Kota Bahru community?	DC 1: Flood resilient strategies of relief shelter.	In-depth Interviews.	Flood resilient strategies of relief shelter. Location and Accessibility Cost Saving Relationship Good Communication Material Modular Shelter Early Preparedness Current Shelter	Theme 1: Connectivity Theme 2: Construction Theme 3: Social and community Theme 4: Preparedness

Source: Author

The interview results revealed important insights regarding flood-resilient strategies for relief shelters. As shown in table 4.0 and figure 4.0 based on the thematic analysis, the first theme aspect is “Connectivity - Location and Accessibility,” emphasized the strategic consideration of shelter location and convenient accessibility for both victims and volunteers. The experts highlighted the need to assess and optimize shelter placement in flood-prone areas, ensuring easy access during emergencies.

The second theme, “Construction,” focused on four key elements: current shelter, cost, materials, and modular shelter. The existing shelter infrastructure was found to be insufficient, with temporary tent-like structures being the primary solution. Cost-saving measures and the use of durable and lightweight materials were emphasized, along with the potential benefits of modular shelters that can be easily adapted to community needs.

The third theme, “Social and Community,” explored the challenges related to communication and relationships within flood-affected communities. Effective communication and information dissemination during emergencies were seen as crucial, and fostering positive relationships within the community was identified as a key aspect of building resilience.

The fourth theme, “Preparedness,” highlighted the significance of early planning and proactive measures in mitigating flood impacts. Early preparedness through early warning systems, evacuation plans, community training, and awareness campaigns emerged as essential strategies to reduce vulnerabilities and enhance the response and recovery from flood events.

Overall, the interview results underscored the importance of considering location and accessibility, improving construction methods and materials, addressing communication challenges, fostering

community relationships, and implementing early preparedness measures to enhance flood resilience in relief shelters.

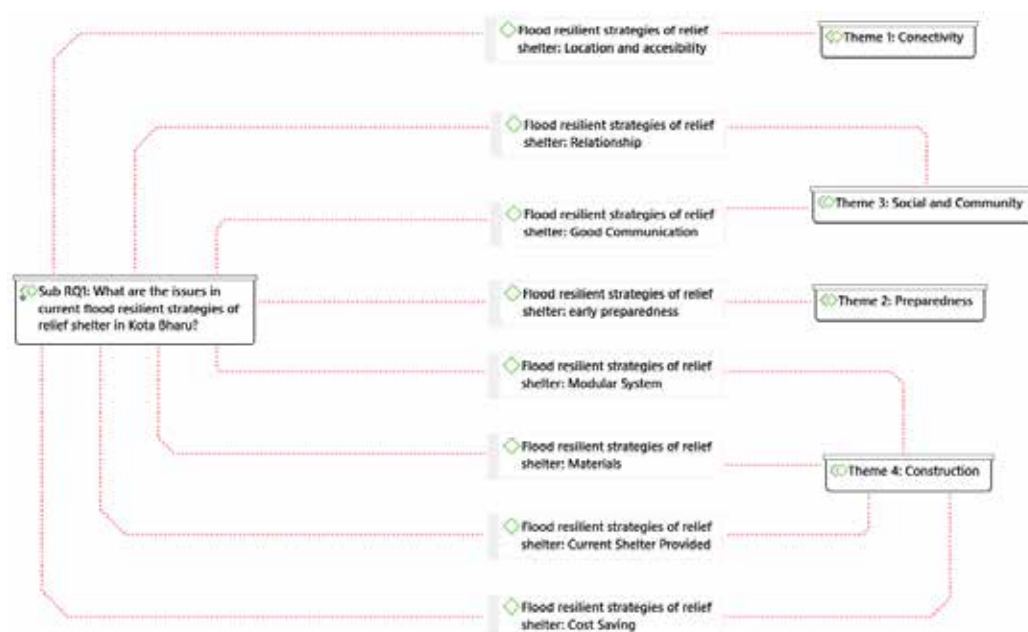


Figure.4.0 Network of theme sub RQ1

Source: Author

Table.4.1 Comparative Analysis of Desk Review

Criteria	Review 1 Hex House	Review 2 Living Capsule	Review 3 Onagawa Container Temporary Shelter
Cost Saving	Need	Need	Need
Modular	Yes	Yes	Yes
Sustainability	Yes	Yes	Yes
Material	Light Weight	Light Weight	-
Unit Space	Considered (can extended)	Considered (limited)	Considered (based on number of family)
Easy assembly	Yes	Yes	-
Overview	The flexibility of the relief shelter is an important consideration in the design process, particularly when it comes to incorporating the necessary spaces. This aspect is closely tied to the overall flood resilient strategy for relief shelters. By ensuring adaptability and versatility, the shelter can effectively respond to the evolving needs of the affected population during and after a crisis.	Integrating sustainability into the flood resilient strategy for relief shelters is paramount, as it ensures the longevity and effectiveness of these structures in supporting victims over time. By incorporating sustainable design principles, materials, and practices, relief shelters can be built to withstand multiple flood events and provide ongoing support to affected individuals.	Furthermore, the study puts forth recommendations for incorporating additional essential spaces within relief shelters. This aspect is crucial in the context of flood resilient strategies for relief shelters. By acknowledging and addressing the specific needs of individuals impacted by floods, these proposed spaces aim to strengthen the overall resilience and efficacy of shelter designs.

Source: Author

According to the desk review comparison based on table 4.1, Hex House, Living Capsule, and Onagawa Container Temporary Shelter, all three were affordable, adaptable, and environmentally friendly. Light materials were used to construct the hex house and living capsule. All three types were taken into consideration when looking at unit space. In terms of ease of assembly, the Hex house and living capsule were both simple to put together. When giving an overview, flexibility is essential in the design of relief Hex house shelters, including the inclusion of necessary areas and enabling flood resilient strategy to successfully respond to changing needs during and after disasters. Incorporating sustainable design ideas, materials, and practise into a flood resilient

strategy, as seen in the living capsule, provides shelter efficacy, longevity, and long-term care for victims. Incorporating crucial places in relief shelters to suit individual needs and specialised needs would increase flood resistance and efficacy for the onagawa container temporary shelter.

Table.4.2 *Comparative Analysis Interview and Desk Review*

Key term of design framework of flood resilient strategy on relief shelter.	Coding identifies in analysis of interview	Criteria identified in desk review.
Location and Accessibility	Consider but less	-
Type Of Families Space Shelter.	No Consider	Yes
Resilience and Adaptability in future	No	Yes
Material Selection	Yes but no efficient	Yes, all are light weight material but each study of the material are different.
Modular and Prefabricated Construction	Should	Yes
Cost	Yes	Yes
Passive Design Strategies	No Consider	Yes
Building Envelope	Without	With
Good Community Engagement	Yes but less	Yes

Source: Author

The table 4.2 provided serves as a comprehensive comparison, integrating the conceptual framework, data analysis, and the identified similarities. It demonstrates a cohesive relationship between the key terms highlighted in the conceptual framework, the coding identified during the interview analysis, and the criteria identified during the desk review analysis. By mapping out these connections, the table offers a detailed understanding of how these elements align and reinforce each other within the research context. It provides a robust foundation for drawing meaningful conclusions and gaining valuable insights from the collected data.

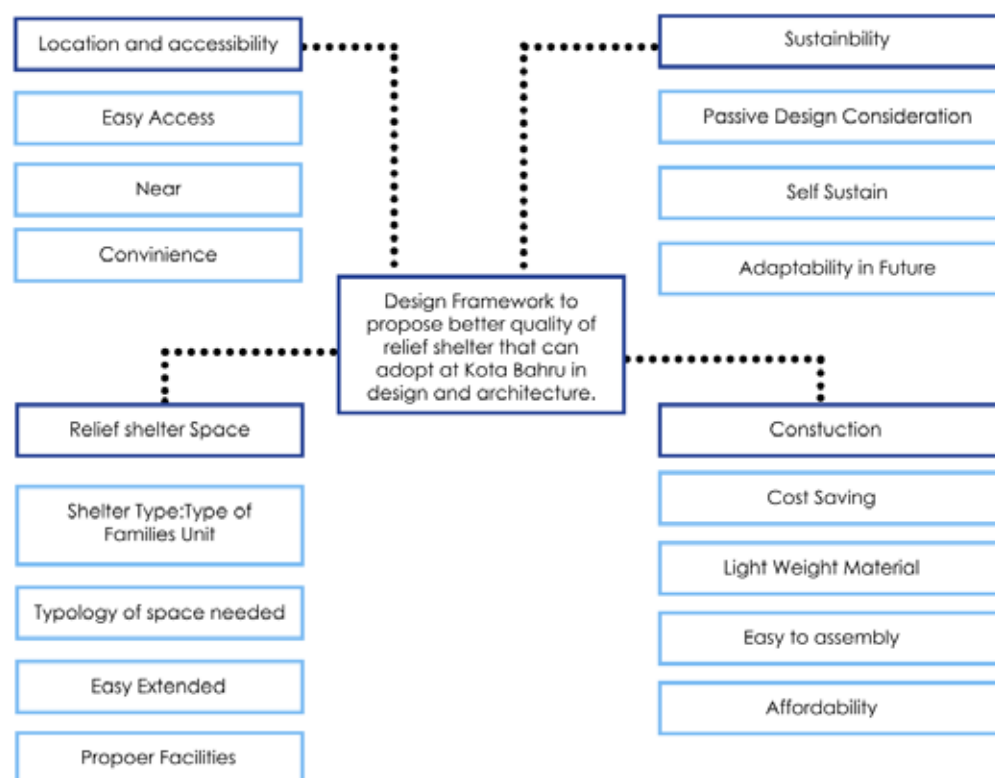


Figure.4.2 *Design Framework to Propose Better Quality of Relief Shelter.*

Source: Author

Based on Figure 4.2, the design framework for improving relief shelters in Kota Bahru focuses on enhancing their location, accessibility, space utilization, sustainability, and cost-effectiveness. The framework emphasizes the importance of easy access to relief shelters by selecting suitable locations that are easily reachable and considering proximity to transportation hubs and essential

services. The design also prioritizes smooth movement and easy entry for all individuals, including those with disabilities. Additionally, the framework advocates for locating relief shelters near essential services to provide convenience and timely access to vital resources for affected individuals and families. The design framework also emphasizes the inclusion of user-friendly facilities and amenities within relief shelters, such as well-designed communal spaces, adequate sanitation facilities, secure storage areas, and reliable power supply. These features aim to enhance the overall comfort and well-being of shelter occupants during challenging times.

Furthermore, the framework focuses on the efficient utilization of relief shelter space by considering the diverse needs of families and allocating adequate space for sleeping, common areas, hygiene facilities, and storage. The design framework emphasizes easy extension and adaptability of relief shelters to accommodate changing family sizes and evolving circumstances. It also prioritizes the provision of proper facilities to enhance the quality of relief shelters, including essential amenities such as sanitation facilities, clean water supply, ventilation, and lighting.

Also the design framework places a strong emphasis on sustainability by integrating passive design principles to optimize energy efficiency and minimize reliance on external energy sources. It also promotes the development of self-sustainable features such as renewable energy systems and rainwater harvesting to reduce reliance on external resources. The framework recognizes the importance of future adaptability in relief shelters and incorporates modular components and flexible design elements to accommodate changing needs and new technologies.

Finally, the framework focuses on cost-saving measures in relief shelter construction by selecting affordable yet durable materials, employing efficient construction techniques, and facilitating easy assembly and disassembly processes. By implementing this comprehensive design framework, relief shelters in Kota Bharu can be more accessible, functional, sustainable, and affordable, ultimately enhancing their effectiveness in providing assistance to individuals and families during times of crisis.

CONCLUSION

In conclusion, the findings of this study highlight the need for stronger and more resilient relief shelters in Kota Bharu to withstand floods. The design framework presented in this chapter serves as a model for improving the flood resistance of relief shelters and provides valuable recommendations for action. The government and NGOs play a crucial role in ensuring that the citizens of Kota Bharu have access to safe and effective emergency shelter during times of flooding.

The findings of this study have practical implications for builders, such as the Construction Industry Development Board (CIDB), in terms of incorporating flood-resistant measures and constructing flood-resilient shelter in Kota Bharu. The study highlights the importance of addressing unfair distributional impacts and promoting social fairness in flood risk governance. It suggests considering mechanisms like partnership funding, constitutional rights to flood protection, and compensation plans to ensure equity in flood risk management strategies. However, the study acknowledges limitations, including the small sample size of three interviewees and the limited time for data collection. Future research could benefit from larger sample sizes and more diverse perspectives to draw more accurate conclusions.

In terms of recommendations for future research, the Malaysian government is already taking action to assist and rehabilitate damaged facilities in Kota Bharu. Initiatives include rebuilding communities through partnerships, repairing infrastructure, restoring the local economy, providing essential services, and enhancing preparedness for future disasters. Additionally, the government has approved the establishment of a Centre of Excellence for Infrastructure Sustainability, which will provide architectural support, guidance, capacity building, and shared learning programs related to sustainable infrastructure. Incorporating these initiatives and the study's architectural recommendations, such as ventilation and thermal mass considerations, can contribute to the construction of effective flood relief shelters in Kota Bharu.

Overall, the study emphasizes the need for stronger architectural capacity and disaster

preparedness in Kota Bharu to effectively respond to and mitigate the impact of floods. It highlights the challenges faced by the community, including slow reactions, lack of access to basic necessities, and inadequate communication between government and NGOs. The study calls for restructuring the current flood resilience strategy of relief shelters and provides valuable guidance for architectural guidelines that can be implemented to better handle floods in future monsoon seasons. While NGOs have contributed to reconstruction and community building, there is a need for better coordination and sustained support beyond crisis occurrences. By addressing these issues and implementing the study's recommendations, Kota Bharu can improve its disaster response and enhance the well-being of its affected communities.

ACKNOWLEDGEMENT

I want to express my sincere gratitude to my supervisor, Dr. Wan, for her unwavering support and guidance throughout my research project. Her insights and timely feedback have helped me refine my research questions, structure my arguments, and develop a coherent thesis. Her nurturing environment has also allowed me to explore my ideas and ask questions, and I appreciate her patience, understanding, and commitment to my academic success.

I would also like to extend my thanks to the individuals who participated in the interviews for my research project. Their passionate participation, input, and time have made the data collection successful, and I am grateful for their contributions.

Finally, I am immensely grateful to my friends and family, who have played a significant role in my academic and personal growth. My friends have been a source of encouragement, support, and motivation, providing a listening ear during stressful times and celebrating my successes. My family has been my rock, providing emotional and financial support and creating a supportive environment that has allowed me to thrive. I deeply value their unwavering support and am grateful for their contributions to my success.

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ADAPTATION STRATEGIES THROUGH AQUA ARCHITECTURE FOR MITIGATING FLOODS AGAINST FUTURE RISING SEA LEVELS IN KUALA TERENGGANU

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ABSTRACT

Kuala Terengganu is a coastal development and waterfront heritage city which acts as the main gateway to coastal tourist destinations. Unfortunately, Kuala Terengganu is inundated by the seasonal monsoon flooding where studies have predicted the city will be impacted by potential rising sea levels by 2050. However, the government's mitigation plan is still lacking architectural adaptation guidelines against floods and rising sea levels. Therefore, this study aims to analyse potential architectural adaptation strategies by means of aqua architecture to mitigate flooding, yet on the other hand would take benefit from the rising sea level to remain economically viable for Kuala Terengganu. In this study, a survey on 52 respondents was conducted after a preliminary desk reviews and case studies were completed to evaluate the extend of floods and rising sea levels impacts in Kuala Terengganu. The aim is to inquire how aqua architecture can be formulated as an adaptative survival strategy for local citizens in Kuala Terengganu. Results found 97.7% of the local community and businessmen would prefer to continue living with water without abandoning their homeland. They prefer to survive where, specifically, with their on-going businesses that would continue to sustain their livelihood and socio-economic in the future. Future studies are recommended to conduct prototypical simulations on selected advanced buildings and infrastructure technologies. Furthermore, this study recommends extending this study to include layout planning and proposing potential building typologies that could be adapted to seasonal floods yet benefiting from the rising sea levels coastal cities in Malaysia.

Keywords: *Flooding, Rising Sea Level, Aqua Architecture, Adaptive Water-Living, Built Environment Informatics*

INTRODUCTION

Kuala Terengganu, also called KT, is a coastal development city located about 440 kilometres northeast of Kuala Lumpur on the East Coast of Peninsular Malaysia. Besides, it is also known as an administrative, economic, and royal capital city of Terengganu state. Based on Rancangan Tempatan Kuala Terengganu 2035 report from Majlis Bandaraya Kuala Terengganu (MBKT), the population of the city is growing from 214,584 to 226,969 from the year 2010 to 2016 and is estimated about 352,064 population in the year 2035. Regarding socio-economic, Kuala Terengganu acts as the main gateway to world-class island destinations, natural ecotourism attractions, and urban and coastal tourist destinations. Referring to the ECERDC Development Council, Kuala Terengganu is currently undergoing the KTCC development planning, known as part of the ECERDC (East Coast Economic Region) plan, which is the plan that the local government would like to boost the urban and coastal tourism, meaning that Kuala Terengganu is relying on tourism as majority business income. According to MBKT, Kuala Terengganu was awarded the title of “Bandaraya Warisan Pesisir Air”, the waterfront heritage city, on 01/01/2008. Apart from that, regarding socio-cultural, Kuala Terengganu retains strong Malay influences and intermixed with other cultures for a long history, forming a coastal city that is rich in arts, culture, and heritage. These elements can be seen along the coastal development, such as Pasar Payang, Kampung Cina, Masjid Kristal, traditional Malay houses, fishing, and boat-making culture in Pulau Duyong.

Unfortunately, sea level rise (SLR) will affect Malaysia's nine major coastal cities, including Kuala Terengganu, which will shrink and become several islands in the year 2050 (CentGPS 2019). Seasonal monsoon Flooding issues also threaten the local populations and development

(TheStar 2021). However, the coastal mitigation plan by the Malaysian government only focuses on land use strategies, conservation, and management of coastal resources (RFZPPN2 2021). Furthermore, the government's mitigation plan is still lacking architectural adaptation guidelines for the local development of Kuala Terengganu to mitigate the floodings and future potential rising sea levels. The formation of Aqua-Architecture, a receptive architectural typology that could provide flexible, safe and adaptable spaces for society to the rising sea levels (Svetlana Kizilova 2019). Aqua architecture is also defined as an architectural adaptation typology used to mitigate and manage flooding in long or short term. Water and architectural design can unite with this adaptation to produce dynamic and reliable mitigation solutions to rising sea levels (Erica Williams 2019). However, the coastal development adaptation measures in Malaysia are the majority as protection approaches such as sea walls or storm surge barriers (Sofia Ehsan et al. 2019). In addition, Kuala Terengganu still doesn't adopt any aqua architecture as an adaptation strategy to mitigate flooding or rising sea levels in future. Therefore, this research aims to analyse potential architectural adaptation strategies by means of aqua architecture to mitigate flooding, yet on the other hand would take benefit from the rising sea levels to remain economically viable for Kuala Terengganu.

The establishment of this research began with one main research question and four sub-research questions. The main research question is formulated as "What are the Key factors to mitigate floods against future rising sea levels through Aqua Architecture as adaptation strategies in Kuala Terengganu." In response to the main research question, the three sub-research questions are composed as "What are the adaptation strategies for floods and future rising levels in Kuala Terengganu?", "How to formulate Aqua Architecture as an adaptation strategy?", and "How to mitigate floods and future rising sea levels by formulating Aqua Architecture as an adaptation strategy for Kuala Terengganu citizens?"

In conjunction to the main research question, literature reviews are conducted following by the sub-research question construction. The deductive codes are then based on the sub-research question construction. The deductive codes that lead to the three sub-topics identified are discussed as follow:

1.1. Adaptation strategies for floods and rising sea levels

The changes in climates contributed to the increase rate of flood and rising sea levels especially in coaster region. Posting to this challenge by focusing on potential barriers as well as the opportunities for adaptation to the rising sea levels in the Norwegian coaster town, Northern Norway was studied by Stokke (2014). Furthermore, flooding in the coastal region caused by extreme rainfall and sea level rise pose dangerous environmental issues that greatly threaten humans' survival. Park et al. (2023) studied a nature-based strategy by using green spaces and seawalls which shows highly effective in monitoring future flooding possibility and risk in Korea. Both Stokke (2014) and Park et al. (2023) are proposing the barrier at waterfront coastal as addressing the adaptation for rising sea levels are the solutions of engineering instead of the architecture. Besides, no floods adaptation was studied by both Stokke (2014) and Park et al. (2023) and proposing the barrier and the waterfront coaster were not the focus of this study. Therefore, this research shall analysis on the architectural adaptation strategies for floods and rising sea levels as the main focus of the study.

1.2. Aqua Architecture formulated as adaptation strategies

The floating structure development, designed in supported by a means of floatation, without a permanent foundation to overcome the flood and rising sea levels in regarding human survivability, lifespan, and cost-effectiveness. To illustrate such an approach, El-Shily (2019) conducted analysis on Abu-Qir and coastal management to introduce floating community model and architecture design guidelines for floating structures for tackling SLR impacts on Abu-Qir. In addition, van Dijk (2021) designed the floating structure in order to identify the success and failure factors influencing the development of floating buildings which the structure can adapting the flood and the rising sea levels. The analysis of aqua-architecture holds the key to survivability in which providing the autonomous functioning of floating structure as an artificial full-cycle ecosystem

studied by Kizilova (2019). However, Paul Dobraszczyk (2017) explores possibilities of thinking in relation to future cities and climate change, focusing on representations of urban drowning or submergence through theoretical understanding of science fiction and ecology. Julia Watson et al. (2020) considers the underwater and intertidal nature-based technologies of indigenous cultures and explores their innovations as solutions for the impacts of climate change to low-lying coastal areas. However, the available literature mainly focuses on which leads to fragmented collection of knowledge and the possibility of researchers conducting almost the same research. In this case, none of the floating or submerged structures have been studied in Kuala Terengganu. Therefore, this study will investigate the floating and submerged structure as architectural adaptation for Kuala Terengganu citizens surviving the incoming of floods and rising sea levels.

1.3. The method of floods and future rising sea levels mitigation by formulating Aqua Architecture as an adaptation strategy for Kuala Terengganu citizens

Kizilova (2019) mentioned that the floating method can be used as aqua architecture solutions to mitigate the flood in terms of infrastructure, agriculture, and energy resources. In addition, El-Shihy (2019) mentioned that the floating structure should be studied on the cost-effectiveness and sustainable approach. Moosa (2020) proposed a theoretical architecture and infrastructure typology addressing critical components needed to provide habitus for communities at risk. Furthermore, addressing a new approach towards floating structure which expands from city land studied by Horn (2013) to adapt the floods and rising sea levels. Besides, Cin (2021) studied that planning waterfront coastal in the urban areas, analysing selected numbers of waterfront projects and highlighted the different morphological characteristics of public spaces, in relation to the approximation to the water body: near the shoreline, in and on water as the strategies of adaptation to the rising sea levels. However, Kizilova (2019), El-Shihy (2019), Moosa (2020), and Cin (2021) studies do not focus on how infrastructure is adopted with aqua architecture more sustainably. Therefore, this study will further investigate on the designs of aqua architecture seeking sustainable infrastructure and spatial planning as part of adaptation strategies for the floods and rising sea levels in Kuala Terengganu.

Based on the research finding from previous literature, there are four hypotheses developed as below:

- H1: Floating structure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.
- H2: Semi or fully-submerged structures can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.
- H3: Floating structures with spatial planning and sustainable infrastructure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.
- H4: Semi or fully-submerged structures with spatial planning and sustainable infrastructure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.

METHOD

Research methods are separated into qualitative and quantitative approaches. The qualitative approach considers primarily exploratory research applied to find out and understand the root cause, opinion and motivation and is often carried out through unstructured or semi-structured techniques such as interviews and observation (Sekaran & Bougie, 2016; Greener, 2008). The quantitative approach is adopted to quantify the defined variables in the research, generate the data and transform them into statistics (Sekaran & Bougie, 2016). Besides that, the quantitative approach can also test and validate the relationships among relevant variables, and the outcomes are more objective than subjective (Zikmund et al., 2013). Therefore, to test and ensure the accuracy of the hypothesis variables, this research will conduct the **quantitative** research method. This method will be vital in obtaining reliable and quantifiable results, enabling us to make informed and valuable conclusions.

The survey aims to explore the respondent's understanding of the impact of floods and future rising sea level on Kuala Terengganu and their preference for adaptation strategies through aqua architecture to mitigate the impact of floods and rising sea level. Raluca Budiu and Kate Moran (2021) recommended that a 40 sample size is appropriate for most quantitative studies; if tested with too few, the results may not be statistically reliable. If tested with too many, it will waste

precious research funding. Therefore, for this research, the author targeted a sampling size of 40 individuals to participate in the survey. The survey form was distributed online and directly by the author to the targeted respondents, who were local citizens working in various professions, such as architects, engineers, authority officers, people in business, and employees. The survey aimed to gather valuable insights and opinions from these individuals regarding a particular topic.

This research conducts the descriptive analysis to summarize the data, describe the research variables numerically and provide descriptive information regarding the set of data collected (Sekaran & Bougie, 2016). In this research, descriptive analysis will describe the survey results. The pair-sample t-test was conducted to analyze and compare the Means value using statistical software, Statistical Package for the Social Science (SPSS). The survey consisted of 6 different sections. Each section has 4 to 6 questions, resulting in a total of 32 questions. The first section is the demographic data to identify the respondents' information and background based on their input. Section 2 to Section 5 was given the title of «Project». All the survey questionnaires in these sections were designed based on the study from the past literature review and case studies to examine both dependent and independent variables. All questions were translated into Malay and Mandarin and attached with graphical images as a reference so the targeted respondents could easily understand the questions. The constructions of the questionnaire base on both variables are shown below:

Table 2.1: *The Constructions Of The Questionnaire*

Section 1- Demographic Data To identify the respondents' information and background based on their input
Section 2 - Project 01: Impacts of Floods and Potential Sea Level Rise Consists of 5 questions, to identify the respondents' understanding and their perception on the impacts of floods and rising sea levels.
Section 3 - Project 02: Adaptation to Floods and Sea Level Rise in Spatial Planning Consists of 5 questions, to identify the respondents' understanding, perception and acceptance of spatial planning as an adaptation strategy to mitigate floods and rising sea levels.
Section 4 - Project 03: Adaptation to Floods and Sea Level Rise Through Floating Structure Consists of 5 questions, to identify the respondents' understanding, perception and acceptance of floating structure as an adaptation strategy to mitigate floods and rising sea levels.
Section 5 - Project 04: Adaptation to Floods and Sea Level Rise Through Semi-Submerged or Fully Submerged Structure Consists of 4 questions, to identify the respondents' understanding, perception and acceptance of semi or fully submerged structure as an adaptation strategy to mitigate floods and rising sea levels.
Section 6 - Project 05: Adaptation to Floods and Future Potential Sea Level Rise Through sustainable infrastructure Consists of 6 questions, to identify the respondents' understanding, perception and acceptance of sustainable infrastructure as an adaptation strategy to mitigate floods against future rising sea levels.

In this research, Dichotomous scales are used to measure all survey questions to help the author to gather direct and precise responses in research and prevent vague or ambiguous answers that may not prove helpful in the research. The respondents can choose “agree” or “disagree” for their answer, and they are recommended to write down their reason if they disagree to explore new outcomes for future study.

Table 2.2: *The Dichotomous Scale*

Description	Number Represent
Agree	1
Disagree	0

RESULT AND DISCUSSION

3.1 Descriptive Analysis

The analysis is conducted with a software application known as Statistical Package for Social Sciences (SPSS). SPSS can perform various types of data analysis that adopted in this research including the descriptive analysis, factor analysis, reliability analysis, Pearson's correlation, Assumption test, multiple linear regressions and others (Pallant 2011). The descriptive analysis is conducted to extract the frequencies of the answers “agree” and “disagree” from the respondents. The results of 52 respondents are compiled and abstracted into the tabulation as shown below:

Table 3.1.1: Descriptive analysis of Mean value and Standard Deviation for Project 01: Impacts of Floods and Potential Sea Level Rise

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
P1.1. Sea level rise will increase the coastal erosion and inundation area, amplifying the risk to residents and local business in the coastal zone.	52	1	1	1.00	.000
P1.2. Residents and businessmen will be at risk, causing economic losses in residential and commercial sectors due to the floods.	52	0	1	.88	.323
P1.3. Infrastructure facilities (e.g. power supply, drainage system, and transportation) that support the city's economy would suffer damage from floods and potential sea level rise	52	1	1	1.00	.000
P1.4. Road networks will be affected and extended due to floods.	52	1	1	1.00	.000
P1.5. Hotel and Tourism businesses will be facing economic loss, especially at coastal areas due to the floods and coastal erosion.	52	1	1	1.00	.000
Valid N (listwise)	52				

Question 1 (P1.1) has 1.0 mean value and 0.000 standard deviation; meaning that all respondents “agree” with the question. However, For question 2 (P1.2), the mean value is 0.88 and standard deviation is 0.323. For question 3 (P1.3) has mean value of 1.00 with a standard deviation of 0.000, followed by question 4 (P1.4) also has mean value of 1.00 with a standard deviation of 0.000. Lastly, question 5 (P1.5) has the mean value of 1.00 with standard deviation of 0.000. In conclusion, all respondents are agree with the statement of P1.1, P1.3, P1.4, and P1.5.

Table 3.1.2: Descriptive analysis of Mean value and Standard Deviation for Project 02: Adaptation to Floods and Sea Level Rise in Spatial Planning

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
P2.1. Seeking water as benefits: designing architectural spaces “in” and “on” the water.	52	0	1	.98	.139
P2.2. Designing public spaces at inundation areas to absorb and store water during flooding events	52	1	1	1.00	.000
P2.3. Water transportation (boating) to replace land vehicles as new road networks during floods and future rising sea levels.	52	0	1	.98	.139
P2.4. Development expands from existing city to offer cost-effective, practical, and market-feasible.	52	1	1	1.00	.000
P2.5. Waterfront adaptation plans: transforming coastal inundation area into waterfront public spaces, incorporating water into urban designs.	52	1	1	1.00	.000
Valid N (listwise)	52				

Question 1 (P2.1) has the lowest mean value of 0.98 with standard deviation of 0.139. However, question 2 (P2.2) has the highest mean value of 1.00 with standard deviation of 0.000, signifying that all respondents agree with the statement. Same as question 1, question 3 (P2.3) has the lowest mean value of 0.98 with standard deviation of 0.139. Question 4 (P2.4) has the same mean value of 1.00 with standard deviation of 0.000 with question 2 (P1.2). Followed by question 5 (P2.5), also has the highest mean of 1.00 with standard deviation of .000. In conclusion, statements from P2.2, P2.4, and P2.5 are the most preferable by all respondents.

Table 3.1.3: *Descriptive analysis of Mean value and Standard Deviation for Project 03: Adaptation to Floods and Sea Level Rise Through Floating Structure*

	N	Minimum	Maximum	Mean	Std. Deviation
P3.1. Floating residential dwellings constructed by local materials has a high appeal to possible buyers.	52	0	1	.96	.194
P3.2. Floating public spaces or buildings constructed by local materials has a high appeal to possible buyers.	52	0	1	.96	.194
P3.3. New infrastructure installed on floating structure can avoid the damage during flooding events and benefits to future sea level rise.	52	0	1	.98	.139
P3.4. Floating buildings or structures that gently change in tidal activity allow the business to continue during flooding events.	52	0	1	.96	.194
P3.5. Activities on the water (e.g. fishing, boat racing, wet market) have high potential to enhance business and appeal to possible buyers and investor.	52	1	1	1.00	.000
Valid N (listwise)	52				

The lowest mean value is 0.96 with standard deviation of 0.194, acquired from question 1 (P3.1), followed by the question 2 (P3.2) also has the lowest mean value of 0.96 with standard deviation. Question 3 (P3.3) has the mean value of 0.98 with standard deviation of 0.139, whereas question 4 (P3.4) has the same lowest value as question 1 (P3.1) and question 2 (P3.2). The last question (P3.5) has the highest mean value of 1.00 with standard deviation of 0.000. In conclusion, the first preference from the respondents is the statement from P3.5, followed by P3.3 as the second preference from respondents, and the last preference is the statement of P3.1, P3.2, and P3.4.

Table 3.1.4: *Descriptive analysis of Mean value and Standard Deviation for Project 04: Adaptation to Floods and Sea Level Rise Through Semi-Submerged or Fully Submerged Structure*

	N	Minimum	Maximum	Mean	Std. Deviation
P4.1. Underwater residential dwellings has a high appeal to possible buyers or investor.	52	0	1	.85	.364
P4.2. Underwater commercial spaces (e.g. hotel, restaurant) have high potential to enhance business and appeal to possible buyers and investor.	52	0	1	.92	.269
P4.3. Accessible underwater public spaces (e.g. coral garden, aquarium) have high potential to enhance business and appeal to possible buyers and investor.	52	0	1	.94	.235
P4.4. Underwater activities (e.g. diving, Snorkeling) have high potential to enhance business and appeal to possible buyers and investor.	52	1	1	1.00	.000
Valid N (listwise)	52				

Question 1 (P4.1) consists of the lowest mean value of 0.85 with standard deviation of .364, signifying that not all the respondents prefer this statement. Followed by question 2 (P4.2), with a mean value of 0.92 and standard deviation of 0.269. Question 3 (P4.3) has a higher mean value than questions 1 and 2, which is 0.94 with standard deviation of 0.235. The last question (P4.4) has the highest mean value of 1.00 with standard deviation of 0.000. In conclusion, the first preference from the respondents is the statement from P4.4, followed by P4.3 as the second preference, P4.2 as the third preference, and the last preference is the statement from P4.1.

Table 3.1.5: Descriptive analysis of Mean value and Standard Deviation for Project 05: Adaptation To Floods And Future Potential Sea Level Rise Through Sustainable Infrastructure

	N	Minimum	Maximum	Mean	Std. Deviation
P5.1. Sustainability has a high appeal on possible buyers or investor.	52	1	1	1.00	.000
P5.2. Local agriculture with minimum imports: aspire for self-sufficient food growth in nutrient rich crops (seaweed farm, hydroponic, aquaponic, floating farm, fish farming).	52	1	1	1.00	.000
P5.3. Sustainable energy generation: solar energy, wave energy (from ocean), wind energy, biomass energy (algae waste).	52	1	1	1.00	.000
P5.4. Sustainable water supply: desalination + rainwater, improved desalination process with rainwater catchment infrastructure.	52	1	1	1.00	.000
P5.5. Sustainable waste management system: innovative mobile floating units that move on the water surface to collect waste, teach the households the waste recycling, how to earn income through the sale of waste in order to prevent waste from being dumped	52	1	1	1.00	.000
P5.6. Education: Skill learning, focusing on the development of new upskill (floating or underwater farming skill, boat making skill).	52	1	1	1.00	.000
Valid N (listwise)	52				

For Project 5, question 1 (P5.1) received the highest mean value of 1.000 with standard deviation of 0.000, signifying that all respondents prefer the statement. Followed by question 2 (P5.2) also received the highest mean value and standard deviation. Besides that, question 3 (P5.3) also has the highest mean value and standard deviation. All respondents prefer sustainable energy generation used as an adaptation strategy, followed by question 4 (P5.4); all respondents prefer the sustainable water supply adaptation strategy as it also has the highest mean value and standard deviation. Furthermore, question 5 (P5.5), which mentions the sustainable waste management system, has received the highest mean value of 1.00 with standard deviation of 0.000, received 100 percent “agree” from all respondents. Lastly, same as other questions, question 6 (P5.6) has the highest mean value and standard deviation, proving that all respondents prefer education learning as part of the adaptation strategy.

Based on the survey results, it appears that the most question received “disagree” was question 4 in Project 4, as 8 out of 52 respondents disagreed with it. However, it's worth noting that the majority of respondents still agreed with the overall question provided. On the other hand, it's interesting to see that all questions in Project 5 received complete “agree” from all the respondents.

3.2. Hypothesis Testing

To examine which hypothesis will be accepted as a design recommendation for mitigating floods and rising sea levels, the pair-sample t-test was conducted to analyze and compare the Means value using statistical software, Statistical Package for the Social Science (SPSS). SPSS is developed by

International Business Machines Corporation (IBM), which is a software package that combined a group of statistic software used for statistical data analysis (Pallant 2011). The descriptive analysis is conducted to acquire the Mean value and Standard Deviation for each question>s before acquire the final result outcome.

Hypothesis:

H1: Floating structure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.

H2: Semi or fully-submerged structures can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Hypothesis_1_mean	.9731	52	.12543	.01739
	Hypothesis_2_mean	.9279	52	.19388	.02689

Table 3.2.1: Paired Samples t-test for Hypothesis 1 and 2

Hypothesis 1 consists of 0.9731 mean value which is higher than the hypothesis 2 mean value of 0.9279; meaning that respondents more prefer floating structure than semi or fully submerged structure as building typology to against floods and rising sea levels.

Hypothesis:

H3: Floating structures with spatial planning and sustainable infrastructure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.

H4: Semi or fully-submerged structures with spatial planning and sustainable infrastructure can help Kuala Terengganu citizens survive the impact of floods and rising sea levels.

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Hypothesis_3_mean	.9872	52	.05318	.00737
	Hypothesis_4_mean	.9720	52	.07096	.00984

Table 3.2.2: Paired Samples t-test for Hypothesis 3 and 4

Hypothesis 3 consists of 0.9872 mean value, which is higher than the hypothesis 4 mean value of 0.9720. The standard deviation value of hypothesis 3 is 0.05318, which is lower than the hypothesis 4 standard deviation value of 0.07096. It means that respondents prefer floating structures with spatial planning and sustainable infrastructure as an architectural adaptation strategy to floods and rising sea levels. Therefore, the floating structures with spatial planning and sustainable infrastructure can be the recommendation for architectural design approaches and apply to the new coastal development in Kuala Terengganu.

CONCLUSION

This research analyses potential architectural adaptation strategies through aqua architecture to mitigate flooding. On the other hand, it would take benefit from the rising sea level to remain economically viable for Kuala Terengganu. This research can also contribute valuable insight for the local business community, especially the local traders who are doing small business, local developers, and local authorities, by providing new architectural adaptation guidelines for future development in Kuala Terengganu.

The result shows that most respondents understand and are aware of the impact of floods and rising sea levels on the local socio-economic, hospitality industry, infrastructure facilities, and road networks. Regarding spatial planning adaptation strategy, all respondents prefer public spaces in inundation areas to store water during flood events, expand coastal development from the existing city for cost-effectiveness, and transform coastal inundation areas into more waterfront public spaces. All respondents prefer to have activities on the water such as fishing, boat racing, and wet market to enhance the business in the future. Followed by the floating infrastructure, which can avoid damage during floods and rising sea level, is the second preference of the respondents. Some respondents do not prefer floating residential dwellings or public buildings because they are concerned about the water's stability. Underwater activities such as diving and snorkelling become the respondents' first preference as they can also enhance the business. Some respondents prefer others rather than underwater dwellings or underwater commercial buildings. The main reason is cost concern and damage to the marine ecosystem. The result also shows that all respondents understand and prefer sustainable infrastructure as an adaptation strategy.

The final result shows that respondents prefer floating structures with spatial planning and sustainable infrastructure as an architectural adaptation strategy to floods and rising sea level. Therefore, the floating structures with spatial planning and sustainable infrastructure can be the recommendation for architectural design approaches and apply to the new coastal development in Kuala Terengganu.

ACKNOWLEDGEMENT

First and foremost, I am deeply grateful to my course coordinator, Dr Mohd Zairul bin Mohd Noor, and my supervisor, Prof. Ts Dr Rahinah Ibrahim, for their unwavering support and guidance throughout my master's program. Their expertise and patience have been invaluable to me and have played a crucial role in the success of this dissertation paper.

I am grateful to Kuala Terengganu authorities' officers, Architects, and engineers for allowing me to conduct my research and for all the resources and support they provided.

I want to extend my sincere gratitude to all of the participants in my study. Their willingness to share their feedback and opinions has been invaluable to my research and helped to make this thesis successful. Thank you for your time and contribution.

Finally, I am grateful to everyone who has supported me throughout this process. With your help and guidance, this research was possible.

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MOBILITY ARCHITECTURE
AND URBANISM

TRANSITION TOWARDS CAR-FREE CITIES TO IMPROVE URBAN MOBILITY AMONG YOUNG FAMILIES

Chee Pei Kim, Rahinah Ibrahim

ABSTRACT

More than 10% of Selangor population are currently residing in Shah Alam. The city will become more dense with increasing population who will work, live and leisure in Shah Alam. The human mobility modes in Shah Alam are expected to change as does the connections to Shah Alam from other cities within the Klang Valley. The study assumes Shah Alam will receive increasing demand for public transportation as intra-urban accessibility is under pressure with increased traffic congestion besides negative impacts to the environment, social life and public health. Despite the authority's low carbon mobility initiatives, there is dearth of guidelines on car-free and low-car developments to achieve low carbon cities and improve the urban mobility. The study interviewed various stakeholders with the aim to understand the challenges and opportunity on achieving car-free cities as well as input from young family lifestyle needs. Results found that 100% respondents support the concept of car-free cities but emphasizes the importance of reliable and efficient public transport system, infrastructure, alternative mobility options, policies, and changes in mindset to enable a successful transition towards car-free cities. The findings also show that 100% of young families prefer and value flexibility in working hours and prioritizes family time. The results would lead to developing a guideline for redeveloping Shah Alam from a car-centric city into a car-free city. This study contributes in supporting the National Transport Policy 2019-2030 by accelerating implementation of low carbon mobility initiatives while improving urban mobility among young families by integrating childcare into the urban mobility infrastructure.

Keywords: Urban Mobility; Young Families; Childcare; Smart Cities; Built Environment Informatics

INTRODUCTION

Background Study

Patel, Gandhi, and Bhatt (2016) to describe a carfree city, being: "a city where a ban on motorised vehicles from all parts of the towns is in practice with only a few possible exceptions such as emergency vehicles". However, as the application of this phenomenon can be seen as a rarity, we will also focus on carfree development, which is defined by Steven Melia (2010) as: "Residential or mixed-use developments which: a) Provide a traffic free or nearly traffic free immediate environment, b) Are designed to facilitate movement by non-car means, and c) Offer no parking for residents or limited parking separated from the dwellings."

The benefits of car-free cities are profound. According to Crawford (2000), car-free cities lead to reduced noise, air pollution, and traffic hazards, along with an enhancement of the quality of life for individuals and communities. They result in vibrant, attractive streets while also saving energy and preserving the environment. Yet, only a handful of cities, such as Venice, have managed to achieve a completely car-free status. Given these substantial benefits, the need and added value of such car-free cities merit exploration. It's critical to determine the successful policies and strategies that facilitate the transition to car-free cities, as well as the underlying requirements and challenges.

Internationally, cities like Amsterdam, Groningen, Freiburg, Copenhagen, and Barcelona have made remarkable strides toward implementing car-free or car-light policies. They offer a wealth of lessons on the effectiveness of certain strategies and infrastructural changes in fostering car-light living. These cities illustrate the challenges and solutions in policy implementation, shedding light on potential pathways for similar transitions in cities like Shah Alam.

In Malaysia, according to the National Transport Policy 2019-2030, the government aims to accelerate implementation of low carbon mobility initiatives. Aligned with the 11th Malaysia Plan and its Sustainable Development Goals, numerous initiatives and projects have been undertaken at the local level, such as the Shah Alam Low Carbon City 2030 Action Plan. This plan seeks to unite the city council, industry players, and civil society to foster a sustainable urban life through comprehensive planning and participatory approaches.

However, despite these efforts, Malaysia is still in the early stages of its journey toward car-free or car-light urban living. Learning from global best practices and applying those lessons to the local context could help shape the future of Malaysia's urban mobility landscape. Understanding the cultural, geographical, and infrastructural differences that could impact these policies' implementation is key to developing a successful car-free transition strategy in Malaysia.

By considering the examples of international cities and localizing their strategies, it is possible to construct a comprehensive blueprint for a car-free or car-light city in Shah Alam, tailored to meet the emerging lifestyle and mobility needs of young families. With the right approach, Malaysia could significantly reduce its dependence on cars, transforming urban spaces into more livable, sustainable, and people-centered environments.

Problem Statement

Modern family life presents a multitude of challenges for young parents. The fast pace of life, long work hours, and the balancing act between work and family responsibilities can be overwhelming (Haddock, Zimmerman, Lyness, & Ziemba, 2006). Current urban design and transportation systems, particularly in car-centric cities, can contribute to these pressures. Extended commuting times, traffic congestion, and the stress and costs associated with car ownership can further compound these issues. A transition to car-free or car-light cities with improved urban mobility could potentially offer young families more time, less stress, and better quality of life. However, this transition needs to be carefully managed to ensure it meets the evolving lifestyle and mobility needs of these families." Space allocation in a city is a zero-sum game. Car-centric cities dedicate ever more space to cars and their storage, making life progressively worse for the people who live there (ThinkCity, 2019). Having more cars on the road (13 million and counting in Malaysia) will result in more time wasted in traffic jams, worsened air and noise pollution, and higher rates of traffic fatalities. Single-occupancy vehicles also produce at least four times more carbon emissions than public transport on a per-passenger kilometer basis (ThinkCity, 2019). On top of the economic and environmental costs, car reliance increases the likelihood of health problems caused by a sedentary lifestyle. Malaysia is already the fattest country in Asia, with almost half of our adult population overweight or obese. In Kuala Lumpur, we spend a daily average of 53 minutes stuck in traffic and 25 minutes looking for parking. That adds up to nearly *20 full days* of idle sitting each year (ThinkCity, 2019). The challenges in prioritizing urban space for people and the adverse perception surrounding micro-mobility vehicles are the result of decades of policies that have turned Malaysia into a car-centric nation (FMT news, 2022). Currently, there's hardly any serious effort to reduce car dependency in Malaysia as this is just common sense especially when government agencies have been preaching about United Nations Sustainable Development Goals, low-carbon cities, road safety, and public health issues (Kadir, 2022).

The decrease in quality of urban environment makes people feel unsafe (example: occupying sidewalks with parked vehicles makes children use the road for riding bicycles or playing forces parents to dedicate more time to child's supervision). People thus seek a safer environment offered by a private garden often available only in the outskirts of the city (the center being already fully built or with too high land values) (Bertolini, 2013). Once a family has moved out of the city, increase of personal mobility no longer represents a personal choice in improving quality of life, but a necessity. More vehicles thus need to be purchased for other family members which, along with the ones purchased for increasing quality of life, lead to road congestion (Nobis, 2003). According to one of the sources with a far-reaching definition, the one of Crawford (2000) (no cars, only emergency vehicles), there is only one city that we are aware of in which carfree is (almost) completely applied, being Venice. However, the book of Crawford itself is mainly theoretical; there is a lack of applied examples. Although several papers analysed the theoretical

aspect of these carfree cities (e.g. Crawford, 2000; Crawford, 2009; Minh, 2016; Nieuwenhuijsen, Bastiaanssen, et al., 2018), there are very few cities in which this complete carfree concept has been implemented (Alameri, 2011). Results to do with the factors related to congestion and reducing the number of cars in areas to counter this congestion (e.g. Bonnel, 1995; C. Nobis, 2003; Tsubohara, 2007). Environmental results are quite often mentioned, with effects like countering the carbon emissions caused by traffic. Nieuwenhuijsen, Bastiaanssen, et al. (2018): *”Despite emerging initiatives and a growing awareness of the environmental, health and social benefits of carfree cities, the academic literature on how to make this transition (...) remains scarce.”* However, this statement is strongly related to the way in which carfree cities are defined.

The current land use of Shah Alam and Malaysia in general are dominated by transport use & road infrastructure. Unfortunately, both affordable urban housing and quality public spaces remained scarce in Shah Alam. Besides, land we could have used for affordable homes or park is instead used to store empty cars. Despite the authority low carbon mobility initiatives, there is still lack of framework and guidelines on car-free and low-car developments to achieve low carbon cities and improve the urban mobility.

What can be concluded from the existing academic knowledge is that car free and low-car developments are on the rise. There is an increasing number of initiatives, and literature describing those initiatives is on the rise as well. However, this still remains an underexposed field of knowledge and there is lack of understanding of how urban design in car-free cities can meet the emerging lifestyle and mobility needs of young families. There is a need to improve the urban mobility among young families through the implementation of car-free cities in Shah Alam.

LITERATURE REVIEW

Car-Free City

The concept of a “car-free city” varies significantly across studies (Crawford, 2000; Foletta and Henderson, 2016; Melia, 2014; Nieuwenhuijsen and Khreis, 2016). It ranges from cities mostly devoid of motorized vehicles, with exceptions for necessary services, to cities completely free of private cars. Despite these varied definitions, Crawford (2000) suggests the purest realization of the car-free concept is rare and mainly theoretical, with the exception of Venice.

While full car-free cities are infrequent, there’s a growing trend in many cities to reduce car prevalence, especially in city centers (Topp and Pharoah, 1994). Some cities, like Oslo, are even planning to pedestrianize their city centers entirely (Rydningen, Høyenes, and Kolltveit, 2017). There are also various examples of car-free or car-reduced residential developments such as GWL-area in Amsterdam, Vauban in Freiburg, and Hammarby Sjöstad in Stockholm (Foletta and Henderson, 2016).

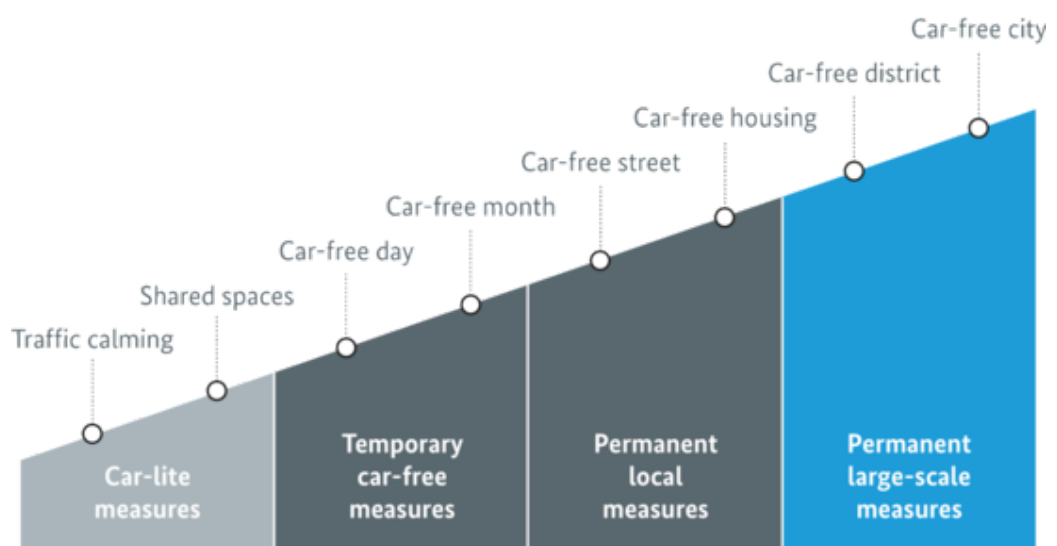


Figure 1.1 Carfree Spectrum
(Adopted from TUMI, n.d.)

However, the literature lacks a comprehensive roadmap for the transition to car-free cities (Nieuwenhuijsen, Bastiaanssen, et al., 2018). Several high-level strategies, such as restricting car access to city centers, implementing urban tolls, and promoting public transport, are commonly proposed (Bonnell, 1995). But these strategies often lack detailed analysis and aren't generally applied in existing residential areas (Steven Melia, Barton, and Parkhurst, 2013).

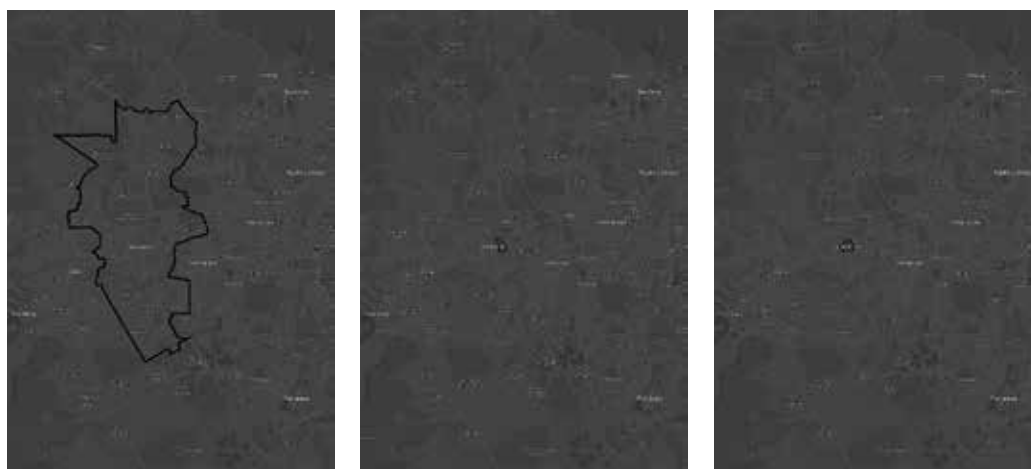


Figure 1.2 Carfree areas example in Shah Alam
Source: Author

In conclusion, the idea of a car-free city, while not implemented in its most rigorous form, is gaining traction and evolving in practice (Nieuwenhuijsen, Bastiaanssen, et al., 2018). More research is needed to develop comprehensive, scalable strategies from existing car-free developments and initiatives, including assessing these strategies' effectiveness in various contexts to inform future urban planning endeavors.

Urban Mobility

Zahraei's (2019) study emphasizes the power of thoughtful urban design to minimize the need for lengthy cross-city travel. By incorporating commonly accessed services, facilities, and amenities within each district, all residents, including the elderly and those with physical challenges, can carry out their daily activities without having to cover long distances. With the juxtaposition of work centers, schools, and leisure and recreational venues, these district centers can function round-the-clock. This also encourages flexible work schedules rather than a rigid 9-to-5 routine and fosters an evolution in mobility modes that cater to 24-hour communities, such as autonomous buses operating continuously (Zahraei, 2019). Yet, it is important to note that Zahraei's study leans towards desirable future scenarios, compelling us to actively work towards bringing these visions to life (Inayatullah, 2003).

Further, Rynning (2018) explores the concept that urban design interventions could potentially sway modal choices, particularly through the influence of the neighborhood-scale built environment on the travel experience. As individuals traverse different neighborhoods during a trip, they interact with the immediate surroundings, and these cumulative interactions, the perceptions and experiences they create, can shape travel satisfaction and consequently future modal choices (Rynning, 2018).

Hipogrosso (2022) posits recommendations for sustainable mobility while considering Transit-Oriented Development (TOD) concepts. These recommendations include the expansion of the bicycle network, improvements in sidewalk and bus shelter conditions, implementation of car parking regulations, and lowering maximum driving speeds. The diversity and compactness of land use in the study area, combined with a high degree of functional mix, makes it a fitting candidate for the TOD urban planning approach (Hipogrosso, 2022).

Lastly, Almeida et al. (2017) argue that carsharing services present a promising alternative to private vehicle ownership, mainly due to their convenience and economic benefits. For urban landscapes, carsharing services offer considerable advantages in terms of both mobility and

environmental impact. Reduced vehicular traffic improves city congestion and allows more efficient use of public space. From an environmental perspective, fewer vehicles on city streets lead to lower pollution levels, improved air quality, reduced greenhouse gas emissions, and diminished energy dependence (Almeida et al, 2017).

In conclusion, the literature underscores that innovative urban planning and design, coupled with progressive mobility services, can significantly influence our travel behaviors and modal choices. This not only enhances our daily travel experiences but also contributes to sustainable urban development. As we progress, it is paramount that we continue to embrace these insights and adapt our urban landscapes to promote sustainable and inclusive mobility. By doing so, we can ensure that our cities cater to all residents' mobility needs while prioritizing environmental sustainability.

Young Family Lifestyle Needs

Multiple quantitative studies have established that our daily mobility patterns can be influenced, to a certain degree, by our lifestyles, which are an amalgamation of our values and practices (Bagley & Mokhtarian, 2002; Beckmann et al., 2006; Kemper et al., 2012; Van Acker, 2015). However, it is still a matter of debate whether these lifestyle considerations are a stronger influence on our mobility choices than traditional socio-demographic factors (Beckmann et al., 2006). Interestingly, our lifestyle choices don't just shape our mobility capital, such as car availability. The interaction is indeed reciprocal, as our travel-oriented attitudes can also impact our car ownership decisions (Van Acker et al., 2014).

This interplay between lifestyle and mobility was notably investigated in Switzerland, where a study focused on the residential choices of families in the urban agglomerations of Bern and Lausanne (Thomas, 2013). With the significant role of mobility in the lives of young families, largely driven by the spatial dispersion of family members' activities, two crucial resources were identified: residential location and car usage. The choice of residence, defined by its accessibility and the services it offers, plays a central role in orchestrating daily life. This is particularly true for dual-income young families, who often favor city center residences to conveniently juggle between professional obligations, family responsibilities, and cultural pursuits. Even though a car was owned by 90% of the surveyed families, a significant 80% marked public transport accessibility as an essential criterion for housing selection. This was to ensure independent mobility for their children, an autonomy that these young parents highly appreciated. The study thus illuminated how different "residential lifestyles" center around certain transport modes that, in turn, influence residential location choices.

Chatterjee et al. (2018) underscores the importance of understanding the evolving lifestyle and travel habits of young adults when predicting future transport use. While forecasting future travel demand, it becomes imperative to consider the extent and pattern of car access across the population. However, there is a notable dearth of data regarding the usage of emerging transport alternatives, particularly shared mobility. To gain insights into how different age groups perceive and use these new options, we need to modify and adapt our survey and monitoring methods.

To conclude, as we forge ahead, it is important to acknowledge that understanding the intricate relationship between lifestyle choices, especially of young families, and mobility patterns is crucial for designing future-oriented transportation policies and urban planning strategies. Our data collection methodologies need to be broadened to encapsulate the dynamic transportation landscape and evolving societal norms. By doing so, we can ensure that our future mobility strategies cater to the diverse lifestyles of our population, with a specific focus on the needs of young families, promoting inclusivity and sustainability.

METHOD

By asking questions about car-free cities, an attempt was made to gain insight into how people think about car-free cities. The second aim was to identify the issues and challenges that people and the local authority face and what factors they think should be present to make a car-free cities successful. The interview questions were prepared using the thematic analysis (Table 1.1 & 1.2), after which the deductive codes were drawn up. During the interviews, the informants attempted

to determine the factors contributing to car-free cities' success based on past experiences and case studies from successful car-free cities like London, Singapore, Madrid and Copenhagen. The success factors were not explicitly mentioned, but open questions were asked to see if the informants mentioned the factors from the literature review and deductive codes themselves. In this way, it was possible to see whether the success factors mentioned in theory are also experienced as success factors by the young families and local authorities.

To better understand the lifestyle needs of young families, semi-structured interviews were conducted with informants from young families, with their background of cooperate office and architecture firm as well as employees of the local authority of the cities. The interviews had a prepared list of questions. However, during the interview, the order of the questions in some interviews changed when a respondent had already answered the following question. Probing questions allowed the collection of more relevant information contributing to the research objective. Informants from young families were asked several additional questions, as some questions related to flexibility in working hours and family time.

Interviews were conducted with young families because the overall aim of this research is to improve and meet the lifestyle needs of young families in future car-free cities. Young families are the people who live in car-free cities, so their input was considered valuable for this research. In addition, future car-free cities are in most cases planned and realized by local authority and architecture firm. Therefore, in addition to interviews with young families, it was decided to conduct interviews with local authority and architects. Their view of the car-free cities provides valuable insights into how local authority and architects view future car-free cities, which can help improve them.

Table 1.1: Thematic Analysis (Sub RQ1)

Source: Author

Main RQ: How can urban design in car-free city development accommodate the emerging lifestyle and mobility needs of young families?					
Aim of research: This research aim to formulate a framework including strategies and guidelines on how to achieve car-free cities to improve urban mobility among young families.					
Informants: • 1 MBSA (Majlis Bandaraya Shah Alam) officer • 1 Architectural firm • 2 Young families					
Research Questions	Deductive codes	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
Sub RQ1: What are the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families?	Issues & Challenges in achieving car-free cities for young families	In-depth interview Literature Review	<i>IQ1: What is your opinion on car-free cities?</i> <i>IQ2: What are the issues and challenges that you think is obstructing the city and the people to shift towards car-free life?</i> <i>IQ3: Would you like to live and work in a car-free cities?</i> a. Are you willing to shift to car-free life if there is availability of alternative to cars?		

Table 1.2: Thematic Analysis (Sub RQ2)

Source: Author

Main RQ: How can urban design in car-free city development accommodate the emerging lifestyle and mobility needs of young families?					
Aim of research: This research aim to formulate a framework including strategies and guidelines on how to achieve car-free cities to improve urban mobility among young families.					
Informants: • 1 MBSA (Majlis Bandaraya Shah Alam) officer • 1 Architectural firm • 2 Young families					
Research Questions	Deductive codes	Strategy of Inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
Sub RQ2: What are the essential factors that can enhance the urban mobility of young families within car-free cities?	Young Family Lifestyle Needs	In-depth interview Literature Review	<i>IQ1: How would you describe a successful car-free cities?</i> a. Which factors do you think have to be implemented to make a car-free cities successful? b. What are your expectations of a car-free cities? <i>IQ2: Would you prefer to adapt a flexible working hours compared to fixed working schedule?</i> a. What are the advantages and disadvantages of remote work in your opinion? <i>IQ3: Do you think public transport and shared mobility are important factors based on your residential choice?</i> a. Would you prefer your children to travel independently? b. Why do you think that your children would want to travel with you? c. If there is childcare centre/nursery that integrate with transit centre, will you like to bring along your children to work? <i>IQ4: Would you like to adapt to 9-to-5 working hours?</i> a. Would you allow your employees to leave work on time so that parents could spent more time with their children? b. If there is a positive impact of performance from the employees, would you like to consider and/or continue with the most practicable working hours in the future?		

Informants

Potential informants were first identified through purposive sampling method (Lopez & Whitehead, 2013). According to Lopez & Whitehead (2013), purposive sampling: in that participants are recruited according to pre-selected criteria relevant to a particular research question. Sometimes referred to as “judgement sampling”, purposive sampling is designed to provide information-rich cases for in-depth study. This is because participants are those who have the required status or experience, or are known to possess special knowledge to provide the information researchers seek.

Table 1.3 Description of Informants

#	Informants	Reason	Date Interview	Transcribed
R1	Local Authority	In-depth knowledge of urban transport in general	20-04-2023	Yes
R2	Architecture Firm	Functioning as architect for several transit stations, hence, have knowledge about future measures and participation in car-free cities	03-05-2023	Yes
R3	Young Family	Understanding of young family's needs in terms of emerging mobility and lifestyle trends	27-04-2023	Yes
R4	Young Family	Understanding of young family's needs in terms of emerging mobility and lifestyle trends	01-05-2023	Yes

Source: Author

RESULT AND DISCUSSION

Interviews

What are the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families?

Opinion on car-free cities

During the interviews, both the young families, the employees of architecture firm and the employees from local authority were asked about their opinion on the concept of car-free cities. The informants' answers are displayed in Table 1.4. The informants generally have positive attitudes towards car-free cities, emphasizing benefits such as lower carbon emissions, reduced traffic, improved safety, and enhanced mental health. However, they acknowledge the need for suitable infrastructure, comprehensive public transportation networks, and consideration of local contexts and public acceptance when implementing car-free city concepts.

Table 1.4 Opinion on car-free cities per informants' group

	Local Authority	Architecture Firm	Young Families
Positive about car-free cities	0/1	1/1	0/2
No one-sided opinion on car-free cities	1/1	0/1	2/2

Source: Author

Issues and Challenges faced in achieving and implementing car-free cities per informants' group

The informants provided valuable insights into the issues and challenges that hinder the transition towards a car-free lifestyle. Local authority of Shah Alam emphasized the need to change the mindset of individuals and shift away from the prevailing car-centric design. He highlighted the lack of comprehensive data and analysis on public transport in planning guidelines, advocating for greater focus on public transport considerations from the early stages of development. Additionally, he addressed challenges related to public transport connectivity, scattered development, and the importance of government campaigns and road pricing as means to gradually limit car usage. The design principal stressed the challenges posed by the climate and discomfort, particularly in hot regions, as well as the need for government policies and enforcement to provide better pedestrian infrastructure.

These issues and challenges reflect the obstacles that cities and individuals face in transitioning to a car-free lifestyle. By addressing these concerns through appropriate policies, infrastructure development, mindset change, and improved public transportation systems, cities can create an environment conducive to sustainable and car-free living. These insights highlight the multifaceted nature of the challenges and the importance of addressing them is essential to facilitate the transition towards sustainable and car-free urban living.

Preference regarding living and working in car-free cities

All informants were asked about their preference regarding living and working in car-free cities. Overall, the informants’ preferences vary to some extent, but there is an overall positive sentiment toward living and working in car-free cities (Table 1.5). The informants highlight the need for safe infrastructure, reliability, comfort, reduced carbon emissions, and improved quality of life as key factors influencing their preferences.

Table 1.5: Preference regarding living and working in car-free cities per informants’ group

	Local Authority	Architecture Firm	Young Families
Leaning towards car-free life	1/1	0/1	2/2
No one-sided opinion on car-free life	0/1	1/1	0/2

Source: Author

What are the essential factors to enhance the urban mobility of young families within car-free cities?

Successful factors of car-free cities

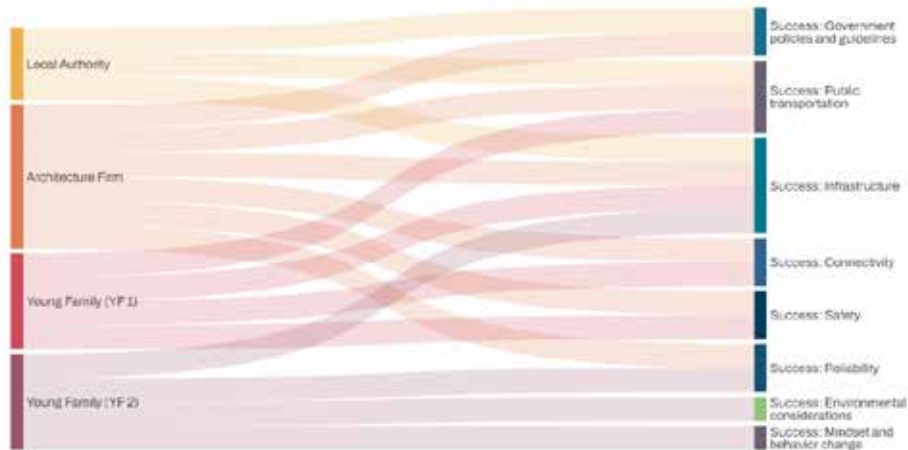


Figure 1.3 Sankey diagram, success factors per informants’ group

Source: Author

These factors were mentioned in response to the questions: “How would you describe a successful car-free cities?”, “Which factors do you think have to be implemented to make a car-free cities successful?” and “What are your expectations of a car-free cities?”. Therefore, some factors may have been mentioned at other times in the interview. However, this diagram only looks at the factors that informants mentioned when they were explicitly asked about factors for success. The first thing to notice is that “Infrastructure” is mentioned by all the informants. This seems to indicate that infrastructure is associated with successful car-free cities. According to the informants, well-designed pedestrian walkways and cycling paths that are seamlessly integrated with public transportation networks and ensuring comfortable and safe infrastructure, such as covered walkways, adequate lighting, and safety features are needed to create successful car-free cities.

A second observation is that both “Environmental considerations” and “Mindset and behavior changes” are mentioned by one of the young families. According to him, he expresses the belief that changing citizens’ mindset is crucial in influencing their transportation choices. He emphasizes the importance of reliability as a determining factor, where general perception is that cars are more dependable. To shift this perspective, he proposes two approaches.

The first is to enhance the reliability of public transport systems, thus encouraging people to choose them over cars. The second approach focuses on environmental factors, aiming to create car-free cities by reducing carbon dioxide emissions. He suggests an example to launch a campaign with a target to reduce emissions by 50% within a decade, which would ultimately result in a 50% decrease in car usage in cities. By presenting these two factors, reliability and the environment, the informant indicates potential strategies for influencing citizens' transportation choices.

Flexible working hours, advantages and disadvantages of remote works

Overall, the informants generally lean towards preferring flexible working hours. They highlight the advantage of flexibility in terms of traffic control, quality of life, reduced stress, and better work-life balance. However, some acknowledge that certain work may still require fixed working hours or face-to-face interaction.

The informants highlight advantages such as reduced commuting time, increased flexibility, and the ability to attend to personal and family needs. However, they also mention disadvantages such as isolation, difficulties in using remote work tools, and the potential for decreased supervision and productivity. The insights can shed light on how flexible work arrangements impact the feasibility of car-free living among young families.

Public transport and shared mobility as important factors in residential choice, independent travel for children, and childcare centers integrated with transit centers

Table 1.6: Perspectives regarding public transport and shared mobility as important factors in residential choice, independent travel for children, and childcare centers integrated with transit centers per informants' group

	Local Authority	Architecture Firm	Young Families
Find public transport and shared mobility are important factors in residential choice	1/1	1/1	1/2
Does not find public transport and shared mobility as important factors in residential choice	0/1	0/1	1/2
Leaning towards independent travel for children	0/1	0/1	1/2
No one-sided opinion on independent travel for children	1/1	1/1	1/2
Positive about childcare center integrated with transit center	0/1	0/1	2/2
No one-sided opinion on childcare center integrated with transit center	1/1	1/1	0/2

Source: Author

The reason why children would want to travel with their parents vary across the informants and include experiencing convenience, saving money, and having a focus on environmental consciousness.

Both informants from local authority and architecture firm respectively express a positive inclination towards the idea of bringing their children to work if there is a childcare center/nursery integrated with the transit center. They both consider the convenience factor of having their children on the same transit line as a benefit, making drop-off and pick-up easier. However, local authority of Shah Alam mentions that the success of this arrangement would require further study to evaluate its effectiveness, while design principal emphasizes the importance of the quality of the nursery provided (Table 1.6). Both informants also acknowledge the potential time-saving aspect of integrating childcare and transit, reducing the need to commute to another industry or location. All the informants show varying levels of interest and support for the idea of bringing their children to work if there is a childcare/nursery integrated with the transit center. They consider factors such as convenience, quality of the facility, educational benefits, and safety measures when expressing their opinions on this matter.

9-to-5 working hours

The table below (Table 1.7) shows that all informants acknowledge the value of adapting to 9-to-5 working hours or incorporating flexibility in work schedules. They recognize the importance of allowing employees to leave work on time to spend quality time with their children and families. They also highlight the potential positive impact on employee well-being and performance.

Table 1.7: Preference on 9-to-5 working hours, allowing employees to leave work on time, and consideration on most practicable working hours continuation after employees positive impact as per informants' group

	Local Authority	Architecture Firm	Young Families
Positive about 9-to-5 working hours	0/1	1/1	1/2
No one-sided opinion on 9-to-5 working hours	1/1	0/1	1/2
Positive about allowing employees to leave work on time	1/1	1/1	2/2
Finds 9-to-5 working hours practicable and consider continuing if positive impact of performance from employees	1/1	1/1	1/2
No one-sided opinion on 9-to-5 working hours but consider continuing if positive impact of performance from employees	0/1	0/1	1/2

Source: Author

Qualitative data analysis from the interviews

Sub RQ1: What are the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families?

Achieving and implementing car-free cities to support the needs of young families presents several challenges. These include resistance to alternative modes of transportation, adverse weather conditions discouraging walking, and inadequate pedestrian and cycling infrastructure. Insufficient data on public transport and a preference for car-oriented development further hinder progress. Overcoming these challenges requires prioritizing public transport, integrating it into planning guidelines, and improving connectivity. Behavior change initiatives and awareness campaigns can challenge car-centric mindsets. Legal considerations such as road pricing should be explored, and creating a clean and safe environment is crucial. Better pedestrian infrastructure, government involvement, and considerations of population density and housing options are important. Financial feasibility and the availability of alternative transportation modes contribute to the success of car-free cities. By addressing these challenges and promoting the benefits of car-free living, sustainable and livable environments that cater to the needs of young families can be achieved.

Sub RQ2: What are the essential factors that can enhance the urban mobility of young families within car-free cities?

The key factors identified by young families for achieving enhanced urban mobility within car-free cities include prioritizing public transport and reducing the number of cars on the road. A comprehensive infrastructure plan that includes cycling paths, pedestrian walkways, and designated public transport routes is crucial. Changing citizens' mindsets through awareness campaigns highlighting the benefits of public transport is essential. Safety measures such as covered walkways and confidence-building measures for cycling are important considerations. Integration of childcare facilities with transit centers is desired to accommodate the needs of young families. Flexible working hours to reduce commuting time and improve work-life balance are preferred. The vision of a car-free city includes improved public transportation facilities, air quality, and low accident rates. The desire for car-free areas, pedestrian-only roads, and a connected urban landscape where pedestrians, public transport, and shared mobility are prioritized is evident. Mental and policy changes, thorough urban planning, connectivity focus, and prioritization of public transportation and non-motorized modes are emphasized. These factors contribute to a sustainable and accessible city where families can benefit from reliable public transport and contribute to a greener future.

CONCLUSION

In summary, this research highlights the factors that enhance urban mobility for young families in car-free cities and identifies the challenges faced during the transition to such urban environments. The findings emphasize the need for a cultural shift away from car-centric mindsets and the importance of prioritizing public transport, pedestrian infrastructure, and awareness campaigns to encourage behavior change. Safety, flexibility in work hours, and the integration of childcare facilities within transit centers are essential considerations for young families. Effective policies, innovative urban planning, and the use of materials like ETFE for noise reduction are crucial for successful car-free cities. The study underscores that transitioning to car-free cities requires a comprehensive societal transformation and offers valuable insights for future research and planning efforts. Ultimately, the aim is to create sustainable, livable cities that cater to the needs of their residents while reducing reliance on cars and promoting alternative modes of transportation.

Significance of Study

The significance of this study lies in its potential to inform the redevelopment of Shah Alam, transforming it from a car-centric city into a car-free city. By identifying the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families, this research provides valuable insights that can guide the development of a comprehensive guideline for the transformation process.

Furthermore, this study aligns with and contributes to the National Transport Policy 2019-2030. The findings support the policy's objective of accelerating the implementation of low carbon mobility initiatives by advocating for a shift towards car-free cities. By prioritizing public transport, integrating childcare facilities into the urban mobility infrastructure, and promoting pedestrian and cyclist-friendly environments, the study offers practical recommendations that align with the policy's goals.

Overall, the significance of this study lies in its potential to guide the redevelopment of Shah Alam into a car-free city, while also supporting the objectives of the National Transport Policy. By offering practical recommendations to enhance urban mobility among young families and promoting sustainable, low carbon mobility initiatives, this research contributes to creating more livable, inclusive, and environmentally friendly cities.

Future Recommendations

Future recommendations for advancing car-free cities and enhancing urban mobility for young families include expanding the sampling size to capture diverse perspectives, incorporating noise reduction measures such as ETFE in urban design, and pursuing ongoing research and innovative strategies. Increasing the sample size will provide a more comprehensive understanding of young families' challenges and preferences. Integrating noise reduction measures like ETFE can address concerns of noise pollution near transport hubs. Continued research and innovative approaches, including integrated transportation systems and public awareness campaigns, are vital for improving urban mobility. Implementing these recommendations will contribute to the development of sustainable and family-friendly urban environments.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to everyone who supported me throughout the completion of this dissertation.

First and foremost, I would like to thank my supervisor, Prof. Ts. Dr. Rahinah Ibrahim for her guidance, expertise, and valuable insights. Her mentorship and encouragement have been invaluable in shaping this research.

I would like to extend my appreciation to my Dissertation Coordinator, Assoc. Prof. Ts. Dr. Mohd Zairul Mohd Noor, for his time, expertise, and constructive feedback. His input greatly enhanced the quality of this work.

My heartfelt thanks go to the interviewees of this study, especially the authority, architecture firms as well as young families who generously shared their experiences and perspectives. Their willingness to participate was crucial in gathering the primary data for this research.

I am grateful to my friends and family for their unwavering support and understanding throughout this journey.

Once again, thank you to everyone who contributed to the completion of this dissertation. Your support and involvement have been essential in the accomplishment of this work.

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ANALYSING THE EXTENSION TRAIL OF LOCALE SPOTS AS A GENIUS LOCI OF PEKAN ROYAL TOWN

Syazwani Mahat, Wan Srihani Wan Mohamed

ABSTRACT

The existence of Pekan Royal Town have always been associated with heritage values and full of local wisdom that represents Pahang as one of Malay royal states, especially where it is noted as port of trade in the olden days. Although each state in Malaysia have established their own royal town's genius loci, Pekan Royal Town heritage characteristic is eroding due to improper planning and modernization. In addition, the locals explain that the town is not familiar to outsiders and has no specific landmark. Therefore, this study is to analyse method for Pekan Royal Town locale spots as a trail extension to avoid the diminishing of heritage characteristic and made known to public. A qualitative study through in-depth interviews with locals and experts, literature review and document analysis will be conducted to discover the issues and opinions that generate the best method to create a journey of heritage trail among local community, authority, and international and local visitors. This study will test the application of heritage trail extension framework to be a genius loci of Pekan royal town and for it to be a certified heritage town. Future research can be look in depth of how this type of method can be used in another royal town in Malaysia.

Keywords: royal town; locale spots characteristic; genius loci

INTRODUCTION

Historically, many countries have their own place or area where the ruler sets it as a place of official administrators and governance ground, especially when the appearance of a king or queen is recognized and established. The specific characteristics and privileges associated with a royal town can vary depending on the country and its historical traditions. A royal town may have the right to display a coat of arms, use a specific regalia or flag or have a particular legal status. The common words used are usually royal town, borough, city or capital. However, it all bears the same meaning where the ruler resides and governs. For example, Royal Town of Seri Menanti in Malaysia, Royal Borough of Windsor and Maidenhead in United Kingdom, Royal City of Patiala in India, and Royal Capital of Mari of Mesopotamia. According to (Royal City Comprehensive Plan, 2009), a royal town is defined as a town that has high value in terms of historical and cultural significance and shows strong relationship between the growth of the community and the development of the urban landscape, especially in terms of built elements. Almost all country that have a royal ancestry or lineage as the ruling government, possesses at least one royal town. The 2nd National Urbanisation Policy by PLANMalaysia (2016), described royal towns as towns with special features and functions under 'Tourist Town' category. Formally, Samsudin (2018), explains the concept of royal town is introduced in 18th century to segregate the authority between local ruler and colonial dictatorship. In the case of Malaysia, the nine state in the peninsular land have their own royal town, named; *Perlis (Arau)*, *Kedah (Kota Setar)*, *Perak (Kuala Kangsar)*, *Selangor (Klang)*, *Negeri Sembilan (Seri Menanti)*, *Johor (Muar)*, *Pahang (Pekan)*, *Terengganu (Kuala Terengganu)* and *Kelantan (Kota Bharu)*.

Table 1.0 : Physical characteristics of five prominent Malay Royal Towns in Malaysia.

Physical characteristic	Kota Bharu	Kuala Terengganu	Seri Menanti	Klang	Kota Setar
Royal palace complex	Istana Balai Besar	Istana Maziah	Seri Menanti complex	Istana Alam Shah	Istana Pelamin
Fortress	Along Kelantan River	Bukit Puteri fortress	Natural hill and palace fortress	Raja Mahadi fortress	Kuala Bahang fortress

<i>Mosque</i>	Masjid Muhammadi	Masjid Putih	Masjid Tanjung Sembeling	Masjid Sultan Sulaiman	Masjid Zahir
<i>Public open space</i>	Padang Merdeka	Padang Maziah	Padang Diraja Seri Menanti	Padang Sultan Sulaiman	Medan Bandar
<i>Market place</i>	Pasar Siti Khadijah	Pasar Payang	Pasar Seri Menanti	Pasar Besar	Pekan Rabu
<i>River and jetty</i>	Kelantan river	Terengganu river	Sri Menanti river	Klang river	Kedah river
<i>Settlement/Kampung</i>	Buluh Kubu	Kampung Keling	Kampung Buyau	Kampung Sungai Udang	Kampung Melayu & Cina
<i>Gateway</i>	Istana Balai inner gateway	Istana Maziah gateway	Seri Menanti gateway	Raja Mahdi gateway	Istana Kota Tengah gateway

Source : Shukri et al,2018.

Malay royal towns in Malaysia have a wonderful dominance in developing the urban fabric and physical characteristic of their royal towns, that includes landmarks, nodes, and natural features. As showcased in Figure 1.0, each royal town have its own notable landmark. Furthermore, a royal town is a representation of culture that exclusively projects the image and identity of that specified state. Physical characteristics are important when defining certain places. These places or buildings might be in use until today or moved to another places for heritage preservation and conservation purposes. Hence, keeping the structure alive and protected, so that the future generation are able to see what the past development have evolved over periods of time. As tabulate in Table 1, the selected five prominent royal town in Malaysia which have notable physical characteristics.

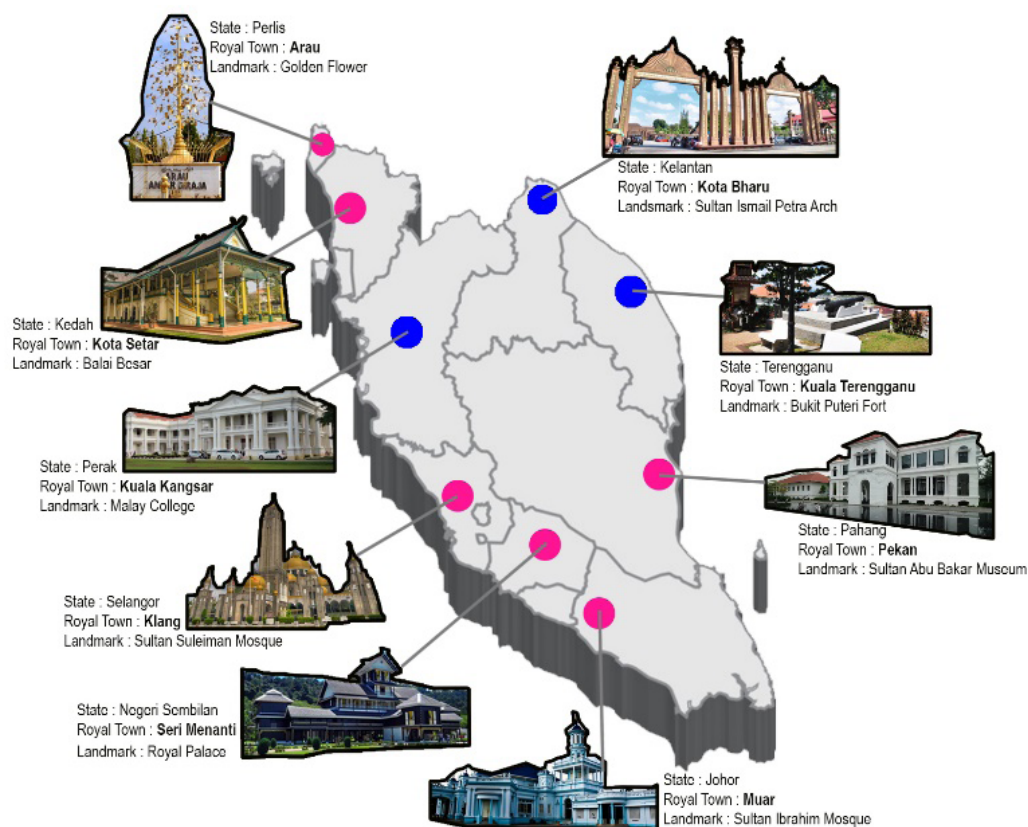


Figure 1.0 : States in Malaysia with its Royal Town and notable landmark. (Source: author,2023)

However, Pekan has no exposure such as other royal town due to unnoticeable landmark. In addition, Shukri et al (2018) and Harun et al (2015) revealed that extensive development growth occurring in most historical towns have significantly eroded identity, sense of place and physical attributes of the Malay royal town. Based on public interviews, most respondents said they know about Pekan but are unsure what is the genius loci of Pekan. When Pekan is mentioned, the existence is known, however further knowledge of what this small yet filled with attractions of town is still very little. In addition, due to these circumstances, the number of visitors that come

to Pahang has reduced 79%, especially to Pekan Royal Town. There is a need of socioeconomic development, says the locals of Kuala Pahang, that is in Pekan municipality. Evidently, news cuts in Figure 2.0 of such issue helps to centralise argument as a matter to solve.



Figure 2.0 : News cuts of central argument.

United Nation World Tourism Organization (UNWTO) concedes that heritage tourism is a complex as cultural heritage attractions tend to be fragile by nature (theStar,2019). Moreover, in the case of Pekan, Pahang, the current sultan state that the royal town to be given a new identity (Bernama,2019). Previous studies stated that the heritage identity of royal town is slowly eroding due to its characteristic are being threatened with improper planning and modernisation (Samsudin, 2018). This problem may prolong if no proper regeneration effort made to preserve the characteristic of royal town in Malaysia.

Therefore, this research is to analyse the attributions in creating an extension of locale spots for Pekan Royal Town to avoid the character diminishing due to improper planning and modernisation. Considering this, the purpose of this research is to analyse the extension of locale spots to be regarded as genius loci of Pekan Royal Town. It can be as a guideline or a blueprint for other royal towns to follow on how to create an extension trail as a means of heritage preservation effort, be it internationally or locally, so that the local community and visitors can enjoy the trail journey, with heritage preservation effort.

This aim of this study is to analyse the attributes in Pekan Royal Town that can lead to genius loci urban development. With the aim of research established, the objective of the study is listed as :-

- Objective 1** – To solve the issues of the current condition of Pekan Royal Town.
- Objective 2** – To create opportunities for locale spots towards an extension trail as a genius loci.
- Objective 3** – to have community involvement as a way of making locale spots lively.

The significance and benefits of finding from this research is to encourage the usage of streets that have meaningful places, hence becoming a network of heritage linkage, the involvement of local community of Pekan Royal Town, be it from the kampung people and district officers / local authority, enhancing the tourism sector, as well as brightening the townscape through extension trail of locale spots. By having this development, it has the potential to nudge young generations to be more interested in heritage topic of preservation. Expanding the usage of streets, not just as a means of mobility route but as social activity space. Give street enhancements by having different purposes and different perspectives. Moreover, appreciation of past histories and sense of belonging via heritage linkage. Adaptive reuse or expanding building functionality, not limited to its original intention. In Local community engagement in heritage preservation also emerged with the effort of exposing to outer community. Community involvement in promoting the genius loci as the identity. As a catalyst to boost tourism sector in Pekan Royal Town. Exposure in and out of the country, recognition internationally.

This research shall focus on heritage available within Pekan Royal Town that is suitable to create an extension trail of locale spots as a genius loci. Aspects such as economic and local community needs will be included to make this research successful and sustainable. Although the authority

and the community have different agenda for Pekan Royal Town future and well-being, the scope of study shall take these different views for them to reach common agreement. How can the people take interest in heritage preservation or any heritage aspects, in accordance with their income source and for the local authorities to satisfy the local planning vision.

Through this literature review, it comprises wide research on the condition of royal town of Pekan and the attributions in generating a well and systematic urban planning. Within this literature review, a number royal and heritage centric town characteristics are referred to create a genius loci using the existing locale spots that is beneficial to the local community and outside visitors. Relevance arguments on what is the elements to be included and discussed to create this genius loci, such as town planning, existing public spaces and attractions usage or the possibility of adding a more contemporary structure or programmes to induced modern development in a royal town.

Genius Loci : The distinctive character or atmosphere of a place with reference to the impression that makes on the mind. Genius loci in architecture can be affiliated as a place that is designated specifically to celebrate the existing cultural identity within the place. According to Christou et al, 2019, a genius loci is referred to a location uniqueness, the soul and the spirit of a place. He explains further how there is a non-secular meaning attached to it and possessed more than just a spiritual element, such as monuments and buildings. Similar with (Norberg-Schulz, 1979), that relates a genius loci with spaces that is resultant of concrete realism defining and affecting the place, a principle that emerged from poetic aspect from Alexander Pope, Vernon Lee and Christopher Tilly, to an intrinsic part of a landscape. Hence, the term genius loci used in this write up shall focus more on places buildings and how it helps in the effort to be part of identity for Pekan Royal Town. For example, the Acropolis of Athens have been a genius loci for Greece after its discovery, where it is connected with the nation heritage and history.

Attributions of Royal Town in Malaysia

On this topic, the discussion of the attribution of royal town in Malaysia, as a means that what makes a royal town itself, in terms of the built structure, the culture available and natural elements. Palace complexes present the identities of the local royal family, architecture symbols and local culture of that area (Shukri, 2018). The Malay administrative have always evolved around the grand palaces. It is also one of the approaches for the rulers to get connected with the subjects, where the authority can be reached the people quicker and efficiently. Most of them were located to nearby rivers and water, reflecting their roles as the maritime centres and traditional harbours. The term *kuala* and *muara* were repeatedly used as name of place in Malay towns which is relates to the river estuary area (Samsudin, 2018). The importance of waterfront is not foreign when discussing a place of civilization. Be it a sea, river and even canals. This statement emphasizes that this natural element contributes to the place name and unifies the place urban heritage and setting of the royal town. The solid and void analysis displays a loose built form and scattered development emerged in between streets. The town will spread following the grids of the earlier street thus creating many cross junctions (Wan Ismail, 2019). Wan Ismail explains the importance of streets when structuring the urban pattern of a royal town. In the typical Malay kampung setting, it is normal to have large voids and clustered solids within the urban fabric, where the locals can locomote freely between houses to get to where they need quicker. According to Ab Kadir (2022), in Classicism, localization and regionalism is based on traditions that began with a sense of ancient origins and from there on, variants and evolutions. She further adds a measure of symmetry and a degree of the assertion of frontage identity in architecture, seen mostly in palatial and aristocratic design in the Malay Nusantara region of Southeast Asia. These styles are regarded as Malay Colonial or an Anglo Malay, of which the main materials are bricks and limestone.

Analysing Locale Spots Characteristic

This topic will scale down to only the important parts of Pekan Royal Town or in other words the locale spots of the town with reference and comparisons to other places, local and

international. The elements of locale spots involve old shop houses, activities, open field, streetscape, and public spaces. Ashraf et al (2022) stated that urban planners and decision makers have been focusing on pedestrian and bicycle friendly only roadways in recent years to ensure a safer and more convenient for traffic movement. MacLeod (2006) stated a positive impact, which is festival gives a 'sense of place' to the visitors, the experience being an insider. He also added festive spaces creating a holistic human environment, a prime example of an 'authentic' place. One of the ways to promote a place is by holding a festival that is significant to local culture. A heritage trail adds value to cultural tourism in old cities (Al-hagla,2010). This paper by Al-hagla weighs on the sustainable development of urban historical areas based on their potential as cultural tourism sites. To support this study, Pine and Gilmore (1998) have come up with principles that can supplement developers in designing memorable realms of experiences for users, that are absorption, active participation, passive participation, and immersion. According to A.Christou (2019), regarding genius loci , some places are unique, steeped in tradition are rich in tradition and rich in history and haunted by their spirit. When the place is well known enough, it can be a genius loci to the place

Local Community Creating a Placemaking

The involvement of local community is one of the best practices to create placemaking, especially in a kampung setting. Although contributions from outsiders and visitors help to develop a successful genius locus of a place, the dependency on them is merely a catalyst. This sub-topic shall observe what type of local community involvement or engagement that can help contribute of placemaking creation, that can generate economical and socially aspects. Without the consideration of safety aspects, living in an urban area will be difficult for people's wellbeing. Schuilenburg (2018) suggested a concept of 'positive security', as a method to improve urban safety and security by strategies based on positive attributes of living together, which are less defensive and more inclusive. Although the crime prevention is put on the shoulders of public security such as police, fireman and soldiers, the involvement of people in reporting a crime is also one of the factors of creating a placemaking within a safe public realm.

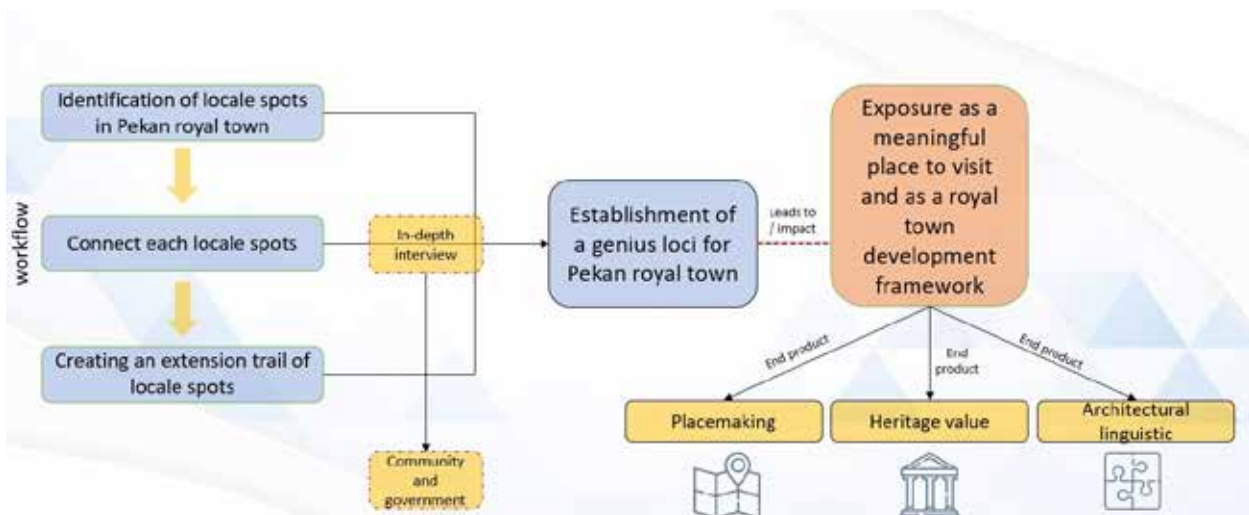


Figure 3.0 : Conceptual framework. Source : Author,2023

Considering the potential that Pekan Royal Town to be one of the most desired places to go to, many interesting locale spots should be highlighted and improve the place's aesthetics such as street arts, delicious foods, and pocket parks. To plan and design an established genius loci requires detailed observation and relevant proposals to be implemented, especially when it is in the hopes of local community contribution. This conceptual framework as shown in Figure 3.0 is comprised of aspects that can be used to create an extension trail by using locale spots to create genius loci for Pekan Royal Town.

METHOD

The approach used for this analysis is qualitative method and uses interpretivism as research paradigm. Initially, to delve into suitable case study and looking in depth on analysing the potential of extension of locale spots as a genius loci and how can it create a community engagement and heritage appreciation. Secondly to explore and observe the people's perception and interpretation of the local community, the authority and tourist about creating a genius loci using locale spots as a heritage trail. By conducting an interview session with them, a clear understanding on how the creation extension trail of locale spots can be a genius loci of Pekan Royal Town. Finally, to confirm the findings, a comparative analysis of similarities and differences was performed utilizing data from the case study, interviews, and literature review, as per Figure 4.0.

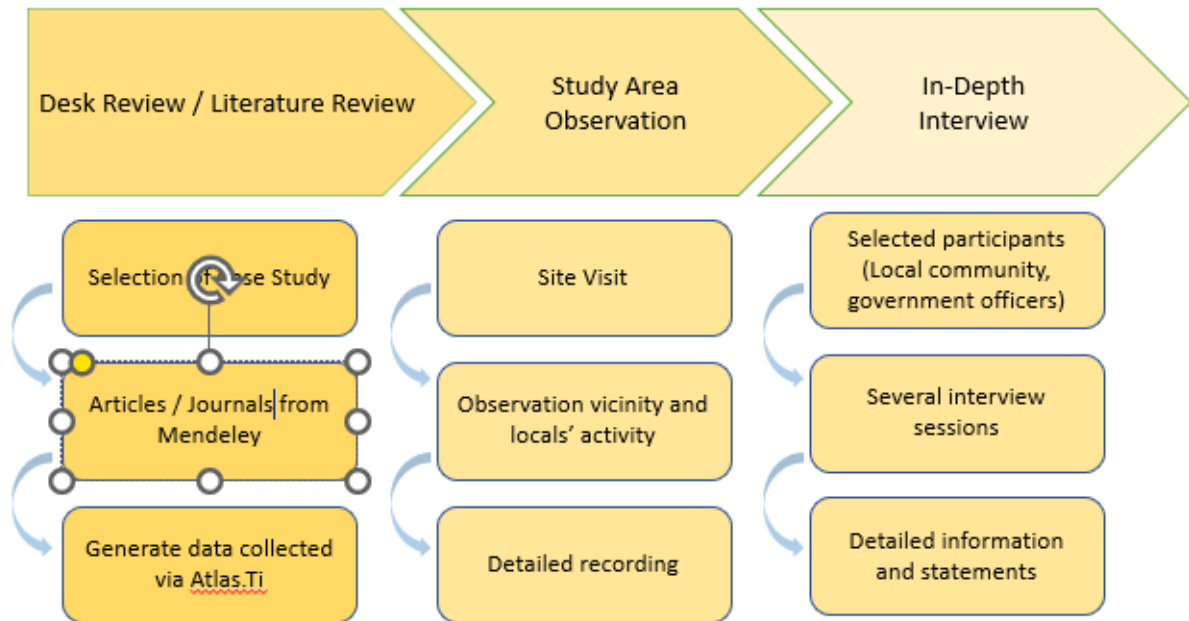


Figure 4.0 : Research methodology sequence. Source : Author,2023

RESULT AND DISCUSSION

The result of selected case studies (secondary data) shown in Table 2.0 as a comparison and similarities features in Pekan Royal Town, followed by a Thematic Analysis Matrix gathered and interpret via in-depth semi-structured interviews with the total 7 people that represent government officers, local community, and researchers, as per Table 3.0. These themes reflect the key aspects related to the extension of locale spots as a genius loci in Pekan Royal Town. They encompass challenges, opportunities, community involvement, heritage appreciation, and the integration of contemporary elements.

Table 2.0 : Case study summary. Source : Author,2023

Attributions	Seri Menanti Royal Town	Kuala Kangsar Royal Town	Bibury, Cotswold	Parc De La Villette
Royal Town ?	Yes	Yes	No	No
Heritage richness	Moderate	Excellent	Excellent	Moderate
Natural elements	Hills	Perak River	River Coln	Canal de L'ourcq
Locale Spot availability	Moderate	Available in town	Available around stream	Many
Notable attractions	Istana Lama Seri Menanti	Muzium Diraja Kuala Kangsar Victoria Bridge	Arlington Row Trout Farm	Thematic garden
Public visibility	No	Yes	No	Yes
Emulation suitability	Yes	Yes	No	Yes
Bicycle & Pedestrian Friendly	No	Yes	No	Yes

Source: Author,2023

Table 3.0 : Thematic analysis matrix. Source: Author,2023

Main RQ : What are the attributes for Pekan Royal Town that can lead to genius loci urban development?				
Aim of Research : To analyses the attributes in Pekan Royal Town that can lead to genius loci urban development				
Research Inquiry : Phenomenology study, 4 government, 2 local people and 1 researcher				
Sub RQ	Deductive codes	Strategy of Inquiry	Inductive codes	
			Coding	Final Theme
1.What are the issues with the current condition of Pekan Royal Town locale spots?	1. Issues in Pekan Royal Town condition	Desk review Expert interview	Issues: Maintenance responsibility Financial assistance Restoration budget Gazette places as state heritage Unsuitable fishing practices Limited action from authority	Theme 1 : Challenges And Opportunities In The Development Locale Spots.
	2. Development of locale spots		Development: Business opportunities without oppression Adaptive reuse for practicality Further recognition adding modern elements while preserving historical features prolonging building usage with different space functions value-added to the building through improvements	
2.What are the opportunity of locale spots towards creating an extension trail as a genius loci?	1. Opportunity of locale spots	Desk review Case study Expert interview	Opportunity: Multiple structure scenery Collaboration with JWN Heritage places gazette Boosting economy Controlled development Expansion of	Theme 2 : Integration of Contemporary Elements
	2. Design an extension trail as a genius loci		Design : Mix of heritage building and attraction Contemporary and modern element Connectivity Walking exhibition Sensory development Culture transfer style Close proximity	
3.What community involvement that can make extension trail of locale spots be lively?	1. Involvement of community	Desk review Expert interview	Involvement: Offering accommodations Showcase arts and craft Management of locale spots Environment conservation Business venture Keep weaving tradition alive	Theme 3 : Vibrant Extension Trails and Heritage Appreciation
	2. Activity at extension trail of locale spots		Activity : Touring via bicycle and walking Linking the places Arts and craft making Cafes, museums, pocket parks Social space Bicycle commuting	

Source: Author,2023

Theme 1 : Challenges And Opportunities In The Development Locale Spots

The theme delves into the challenges and opportunities in the development of locale spots in Pekan Royal Town. Under the theme of “Challenges and Opportunities in the Development of Locale Spots,” two main deductive are explored: issues and development. Regarding the issues, several key codes have been identified. The responsibility of maintenance emerges as a critical concern, as it requires concerted efforts to ensure the upkeep and preservation of locale spots. Financial assistance plays a pivotal role, as adequate funding is required for restoration and conservation efforts. The allocation of a restoration budget becomes imperative to address the specific needs of locale spots. Gazetting places as state heritage is another crucial aspect, providing legal protection and recognition to preserve their historical and cultural significance. Additionally, the interviews uncover challenges related to unsuitable fishing practices, which may impact the sustainability of marine resources, and highlights the need for stronger action from the relevant authorities to address these issues comprehensively. On the other hand, the development aspect showcases a range of opportunities. Business opportunities without oppression are emphasized, fostering an environment where entrepreneurs can thrive and contribute to the local economy. The concept of adaptive reuse emerges as a practical approach, allowing locale spots to be repurposed while preserving their historical features. Further recognition, such as national heritage status or even UNESCO recognition, presents an avenue for raising the profile of locale spots and attracting visitors. The integration of modern elements into historical structures is explored to enhance functionality without compromising their authenticity. Furthermore, the theme explores strategies to prolong the usage of buildings by incorporating different space functions, thereby adding value and ensuring their long-term sustainability. By critically examining the challenges and capitalizing on the identified opportunities, the theme seeks to contribute to the overall development and preservation of Pekan Royal Town’s locale spots. Through comprehensive analysis and recommendations, it aims to provide insights into how these locale spots can be transformed into vibrant and sustainable assets for the town, while respecting their historical and cultural significance.

Theme 2 : Integration of Contemporary Elements

The theme focuses on the integration of contemporary elements in the design of an extension trail as a *genius loci*, exploring the opportunities presented by locale spots. The deductive of the dissertation are centered around the themes of opportunity and design. Under the theme of opportunity, several key codes have been identified. The presence of multiple structure scenery offers a diverse and visually appealing environment for the extension trail. Collaboration with Jabatan Warisan Negara (JWN) is highlighted as a valuable opportunity to ensure the preservation and promotion of heritage places, with the potential for gazetting. The theme also explores the potential for boosting the economy through the extension trail, as it can attract visitors and stimulate local businesses. Controlled development is emphasized to ensure that the integration of contemporary elements is done in a manner that respects the existing character of the locale spots. Furthermore, the expansion of building purposes provides an opportunity to repurpose heritage buildings, allowing them to serve new functions and contribute to the overall experience of the extension trail. In terms of design, the theme highlights the importance of a mix of heritage buildings and attractions. By incorporating contemporary and modern elements, the extension trail can strike a balance between preserving the historical significance of locale spots and offering engaging and relevant experiences to visitors. Connectivity is crucial, ensuring that the trail creates a seamless experience as visitors navigate through the locale spots. The concept of a walking exhibition is explored, providing an interactive and immersive journey for visitors to discover and appreciate the *genius loci* of Pekan Royal Town. Additionally, the theme considers the importance of sensory development, creating spaces that engage visitors’ senses and evoke a deeper connection to the locale spots. The influence of culture transfer style is acknowledged, as contemporary elements are integrated with the local heritage and traditions. Close proximity is emphasized to facilitate accessibility and convenience for visitors. By exploring the integration of contemporary elements in the design of the extension trail, the theme aims to showcase the

potential for creating a dynamic and engaging experience within the genius loci of Pekan Royal Town. It seeks to provide insights and recommendations on how to balance the preservation of heritage with the integration of modern elements, ultimately enhancing the overall appeal and cultural significance of the locale spots.

Theme 3 : Vibrant Extension Trails and Heritage Appreciation

The theme explores the theme of “Vibrant Extension Trails and Heritage Appreciation,” focusing on the involvement of the community and the activities within the extension trail of locale spots. Under the theme of community involvement, several key codes have been identified. Offering accommodation within the locale spots presents an opportunity for community members to participate in the tourism industry and provide unique experiences for visitors. Showcasing arts and crafts allows the community to highlight their cultural heritage and craftsmanship. The management of locale spots by the community fosters a sense of ownership and responsibility in preserving and promoting these heritage sites. Environment conservation emerges as a key aspect, encouraging sustainable practices and ensuring the preservation of the natural surroundings. Additionally, the dissertation explores the potential for community members to engage in business ventures related to the extension trail, contributing to the local economy. Furthermore, the dissertation recognizes the importance of keeping weaving traditions alive, the Tenun Pahang Diraja, emphasizing the cultural significance and heritage value of these crafts. Regarding the activities within the extension trail, several codes have been identified. Touring via bicycle and walking is a popular and sustainable means of exploring the locale spots, offering opportunities for exercise and leisure. Linking the places within the trail ensures a cohesive and connected experience for visitors. Arts and craft making activities provide interactive and educational experiences, allowing visitors to engage with the cultural heritage of the area. The presence of cafes, museums, and pocket parks enhances the social spaces within the extension trail, creating gathering points for locals and visitors alike. Bicycle commuting is emphasized as a mode of transportation within the trail, promoting sustainable mobility and reducing reliance on cars. Through vibrant extension trails and community involvement, the theme aims to foster heritage appreciation within the locale spots of Pekan Royal Town. By encouraging the active participation of the community and offering engaging activities, the extension trail becomes a dynamic and immersive experience that celebrates the heritage, culture, and natural beauty of the area.

CONCLUSION

In conclusion, understanding the core problem that existed in Pekan Royal Town is one of the ways to introduce contemporary urban development to the area. To respond Theme 1 : Challenges and Opportunities in the Development of Locale Spots, Theme 2 : Integration of Contemporary Elements and Theme 3 : Vibrant Extension Trail and Heritage Appreciation, although Pekan Royal Town is filled with heritage values and rich natural elements, it may be meaningful to add a modern improvement in the locale spots in terms of landscaping, structure, or activities so that it can be a new attraction for the local community and outsiders; hence becomes their supplementary source of income when visitors come to Pekan Royal Town, hence achieving title as tourism town. On limitations, it is a bit ambitious to masterplan or implement smart public transportation such as tram or LRT in this town because the area is underpopulated, and it is not worth introducing such development and will not generate a high revenue turnover. When commencing the design stage of this new development of extension trail as a genius loci using locale spots, it is crucial for the developers to extract information about the needs of the area and make SWOT evaluation, especially a town that is surrounded by kampung settlements, such as to get their opinions, vision and mission as a local settlers, and what is the most expectation they hoped when a new development being done to make their livelihood better. Overall, this research helps to achieve the aim of analysing the locale spots of extension trail to be genius loci of Pekan Royal Town.

ACKNOWLEDGEMENT

The journey of writing this paper has been one of the most memorable experiences in my life, which makes architecture more challenging and appreciated. With the assistance of individuals around me, I would like to show my appreciation by engraving their names in this write up acknowledgement. First and foremost, I would like to thank my parents for being the backbone throughout my architecture study journey. Next is my supervisor, Dr. Wan Srihani Wan Mohamed for her undeniable compassion and guidance in giving knowledge for me to produce an independent and strong dissertation paper. I would also like to thank the coordinator for Architectural Dissertation course, Assoc. Prof. Dr. Mohd Zairul Mohd Noor for his advice in writing this dissertation paper and to all the significant organization that is willingly exchange their knowledge on architecture heritage aspects that is beneficial to myself and the public (Jabatan Warisan Negara, Perbadanan Muzium Pahang and Majlis Daerah Pekan). In the fullness of time, I am grateful for my family and friends for always being there encouraging with laughs and joy during my tears and upsets. No words can be described to showcase the gratitude and generosity I have received from everyone.

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AIRPORT-DRIVEN CITYSCAPES: REDEFINE CITYSCAPE OF MALAYSIA BY INTRODUCING AIRPORT INTO URBAN AREAS

Mohd Zairul Mohd Noor, Koh Yen Ru

ABSTRACT

An airport serves as the focal point of the infrastructure, land use, and economy of an aeropolis. The aerotropolis is made up of 1) the airport's aeronautical, logistical, and commercial infrastructure, which forms a multimodal, multifunctional airport city at its core, and 2) outlying corridors and clusters of businesses and associated residential developments that feed off each other and their accessibility to the airport. This structure is similar to the traditional metropolis, which is made up of a central city core and its outlying commuter-linked suburbs. Kedah Menteri Besar Datuk Seri Muhammad has urged Prime Minister Datuk Seri Anwar Ibrahim to approve the Kedah Aerotropolis logistic hub project. The state government in Malaysia is also committed to developing the Subang aerotropolis to raise the economic status of citizen. Though, the distance between the existing urban areas and airport will be greater and may be in the line of slowing down the evolution of airport. Nevertheless, cities may be facing scarcity of land if there is any enlargement of aviation infrastructure. Thus, this research aims to introduce airport into urban areas by challenging the notion of airport development towards vertical build-up to sustain the ever-expanding behavior and redefine cityscapes of Malaysia with two objectives: (1) to investigate factor and variables of city airport, which can be adjusted and applied towards its dynamic and demand through understand morphology of city and airport development; (2) to formulate specific elements, criteria and components of designing verticality for expansions of airports. Interviews and phenomenological research will be conducted to understand and imagine the potential changes that could be made to the city airport's development while supporting the always transforming, explosive activities, and providing a seamless connection to the urban sphere. By finding the factors and variables of city airport in formulating scenarios, a list of strategies and principles will be recommended based on two parameters: improve connectivity in between cities and airports and developing sustainable airport expansion in Kuala Lumpur. Future research can add more variables to planning towards pro-active airport designs, cities will be more adjustable and applicable towards its dynamic and demand.

Keywords: airports; aviation; cityscapes; transportation; mobility; infrastructure

INTRODUCTION

Background Study

With the makeover of Sultan Abdul Aziz Shah Airport, also known as Subang Airport, which served as the capital's old international gateway, Malaysia is reexamining its intentions to become a dominant force in the region's aerospace and business aviation sectors. Airports are usually referred to as the main example if one wishes to know how well-evolving one country's construction industry is in the context of an urban area. Most modern airports are transformed and developed from military zones, shopping malls, brand names and more (Fuller and Harley, 2004). Throughout history, we have witnessed Malaysia's aviation that is limited to soldiery service have marched its way towards a complex techno-cultural machine, which drives special attention to keep these ever-changing spaces intact. This scenario is the same as how urban areas of Malaysia transform from a trading port into a modern country.

Trend of Aviation Industry | Growth in Asia Pacific Market

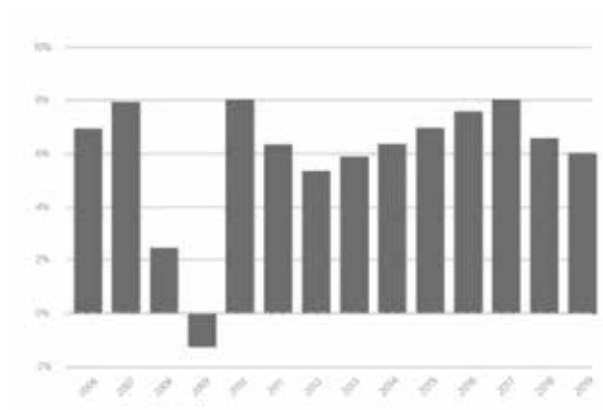


Figure 1.1 shows the annual growth of air traffic passenger demand.
Source: IHLG (2017)

The aviation industry is becoming one of the greatest economic growth drivers in nations and arguably an indispensable form of transport. According to Industry High-Level Group (IHLG) report in figure 1.1, Aviation Benefits 2017, air transport has doubled in size every 15 years and has grown faster than most other industries. (IHLG, 2017)

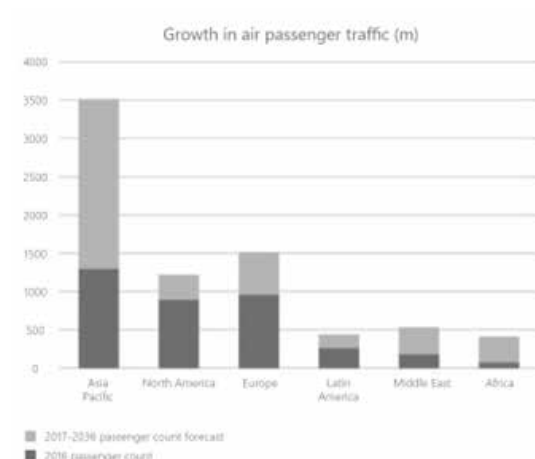


Figure 1.2 shows the 20-year forecast of air passenger traffic growth.
Source: IATA (2017)

Based on IATA's 20-Year Air Passenger Forecast in 2017 in figure 1.2, passenger numbers could double to 8.2 billion in 2037. This forecast also predicts that the Asia-Pacific region will drive the biggest growth with more than half the total number of new passengers coming from these markets. (IATA, 2018)

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Problem Statement and Research Gap

Motivational Problem

Fifty-one percent of people worldwide reside within one hundred kilometers of an international airport and 74% of people live within one hundred kilometers of any airport. As a result, the airspace is already crowded, and over the next 20 years, air traffic is expected to increase. (International Civil Aviation Organization ICAO, 2019) We also need to include airports into account in airspace. Airports have already been constructed and running at capacity around big cities center. And aviation is now having an impact on city mobility in addition to that of across continents and cities.

The most well-known supporter of aerotropolis concepts, John Kasarda, has written a ton of papers since 2006 touting the advantages of these massive initiatives. Airport Cities and the Aerotropolis is where the series starts. Examples of projects with similar type are frequently mentioned in the following publications, which include Schiphol, Frankfurt, Munich, Stockholm Arlanda, Hong Kong, Kuala Lumpur, Changi, and Incheon in Asia, as well as McCarran and Dallas / Fort Worth in the United States. Several of the ambitious aerotropolis dreams have come true over time.

Others keep getting blocked, despite the governments' heavy-handed intervention in designating big land areas and giving airport-developer partnerships broad planning authority. (Global Anti-Aerotropolis Movement GAAM, 2020) Penang International Airport's cargo capacity is insufficient to meet the current demand. As a result, factories in Penang must use Kuala Lumpur and Singapore as their gateways to the US, Europe, and other nations. This has increased demand for freight forwarders who can handle cross-border transportation by ship, rail, and road. (Matrade, 2019) With the rising demands, actions to connect airports to cities should be taken.

However, there is no standard guideline or expected design framework created on how existing cities could link with the existing or new airports regionally like other urban transportation modes such as car, taxis, bus, and train terminal. Eventually, this will affect how cityscapes work for each citizen travel from individual checkpoints into regionally planned station hubs according to surrounding land use, nodes, landmarks, edges, districts, and other related urban fabrics.

Research Problem

The EU's deregulation of the air transport industry has resulted in a significant increase in demand for regional airports, which are frequently located distant from major cities. (European Parliament, 2021) The first goal of liberalizing the air transportation business was to boost competition. This has ended up the demand for airport takeoff and landing slots increased. Several rural airports—some of which were once military airports—expanded due to established main airports' inability to meet this growing demand. Building more runways, taxiways, and gates at busy airports with the persistent issue of low infrastructural capacity is one of the most efficient ways to expand the nation's airspace capacity. Investments in runways have the greatest potential to minimize traffic and delays in airports with high passenger volumes that are susceptible to harsh weather conditions that can significantly limit use of current runways due to their configuration, geometry, length, and other features. (Alabi, B. N. T., et al. 2021) Unfortunately, building new runways is expensive, and once built, they are troublesome to change. Due to noise and environmental problems, as well as the shortage of land at certain older, urban airports, building new runways at major airports has proven to be an expensive and time-consuming procedure.

All airports except for the seven big airports have been unable to expand their runways over the past ten years due to these issues. (National Academies of Sciences, Engineering, and Medicine, 2022) Although many western cities have seen deflation and shrinking, a trend of continuous growth can be observed around airports, with infrastructure linking city to airport such as highways and railways that produced an enormous urban output. Yet, these new forms of growth patterns frequently occur in the absence of comprehensive planning ideas and with minimal to no involvement from local and regional stakeholders. The well-known image of today's airport spaces such as faceless business parks sprawling alongside traffic passageways, commercial retail,

and unorganized suburban residential areas, resulting from the lack of cooperation among urban planners, public institutions, airport authorities, and private investors, despite the area's potential to become a future integrated development hub. (Metropolis, 2018)

Previous studies only focused on horizontal expansion, without eliminating the complexity, design for airport in city center should be analyzed in the condition of runway. With consideration of how urban planning works, it can be executed by elevating from the ground. Additionally, terminal operations could be stacked vertically and the technologies integration of vertiports as the latest air travel experience, which would overturn the connectivity of travelers towards cities.

LITERATURE REVIEW

Anatomy of Airport

Fuller, Gillian, and Ross Harley define airports as a device for transferring goods from land to the air. Every movement system is built around access, control, and separation. The airport is a complicated machine made up of numerous interconnected and cross-referenced systems, tasks, legal jurisdictions, and modes of transportation. (Fuller, et al., 2004) Depending on where you are, how you are moving through it, and why, will determine what the airport is. Corporate or governmental screenings are the focus of internal processing. Cross-referencing is done between passengers and bags, followed by sorting, and packeting along various routes.

Terminal Planning Consideration

The placement of runways and taxiways on airport property is one of the key components of airfield configuration. The availability of a particular configuration may be constrained by environmental conditions like wind, noise, and installed instruments (such the Instrument Landing System (ILS)) that are present at any one moment supported by Ahmed. For instance, it is impossible to use a runway when there is a strong crosswind. In addition, if a runway is not properly instrumented for the operations, it may not be used due to low visibility circumstances. (Ahmed, et al., 2018) Master plan of airport also considered the positioning of passenger terminal apron, facilities for cargo, fuel farm, aircraft maintenance, in-flight catering services/flight kitchen, airport administrative and so on that will further explain in the next section.

The future expansion of the airport may interact with nearby land uses. The terminal planner should be aware of the state of local land use, especially in urban planning because it may have a significant impact on the terminal planning process, even if they are typically not involved in dealing with this larger issue.

Planning for ground access transportation takes place at airports on both a regional and local level, also classified by Landrum. Regional long-range planning must consider the anticipated future needs of airport users, and the strategic aspects during the creation of an airport master plan. (Landrum & Brown. 2010)

Terminal security extends beyond anti-terrorism and hijack concerns. The airport operator must work to protect the public from theft, physical assault, vandalism, vehicle damage in parking facilities, and all the usual worries found in a very dynamic, highly transient, and stressful public environment.

Inevitably, any type of construction and buildings by mankind may cause environmental damage that may need decades to recover. The impact is even larger in the case of airports. Kaszewski exposes that when there are new airport proposals, local impacts such as noise, traffic congestion, pollution, consequential development, land-take, and habitat loss are damaging the surrounding environment. (Kaszewski, et al., 2004) This can be avoided by having an airport located in the city center, preventing airports from duplicating the same services, programs and facilities that existed in the surrounding context. Thus, excavations for utilities and infrastructure are minimized.

Due to the large degree of capital expenditure required, airports have a higher share of fixed expenses than many other industries, making it more difficult to swiftly cut costs in the event

of a decline in demand. Additionally, having infrastructure that is easily adaptable to increased traffic flows (or a different mix of traffic types) should traffic exceed estimates boosts confidence because management, investors, and lenders are concerned with whether predicted profits will materialize. Because airport planning and decision-making are long-term processes, estimating future demand is a critical component of all investment decisions. Even though these choices must be taken without knowing what the future will bring, there are a number of tactics airports may use to increase their business resilience.

Urban Transportation Planning Consideration

As mentioned by Tobias, mobility is the ability to move physically from one place to another. The term “culture” refers to a body of beliefs, norms, behaviors, and rituals. Mobility The “set of values, conventions, or social practices associated with the capacity to travel from one place to another and with actual physical travel,” as defined by the dictionary, is referred to as culture. However, physical travel is not always an option in contemporary culture. Our ability to travel is a societal success that is being formed by these framework circumstances and practices due to the reliance on infrastructure, the accessibility of technology, as well as a vehicle operator or pilot. (Tobias, 2013) This may be involvement of countries ‘vision, state government policy, urban master plan in boosting both technologies and economy of related field and programs.

This urban transportation subsystem is crucial in building a complete development strategy to ensure the competitiveness and economic growth of the region. However, city planning must have the potential to serve the area effectively to promote an efficient relationship between city planning and airport-centric development. In this perspective, the issues are crucial: Availability of infrastructure and logistics facilities; inefficiencies and detrimental social, economic, and environmental effects; other urban subsystems; an effective access network, including a railway, highway, and road; integrated planning in the entire urban region (including the airport); the wide range of aviation- and non-aviation-related activities that city logistics may support, the urban areas and the target region’s demographics, and the detrimental effects of airport-centric development on the urban area. (Boloukian, et al., 2016)

Emergence of New Aircrafts

A variety of electric vertical take-off and landing (e-VTOL) aircraft and short take-off and landing (STOL) models have been presented to open this mode of transportation as part of the Urban and Regional Air Mobility (UAM & RAM) initiative to expand passenger transportation into the third dimension. The design of e-VTOL and STOL aircraft for passenger transport is a new field. Nathen stated there are seven degrees of freedom (DOF) that drive the design which vital for inner city operations to enable scaling of mobility services: payload, speed, range, noise, simplicity, safety, and cost. (Nathen, et al., 2021)

METHOD

Data Collection

To gather information from seasoned experts in the aviation sector, a systematic questionnaire was created and employed in this part of the study’s interpretive method. The purpose of the questionnaire was to examine how acceptance and concerns impacted the typical characteristics of passenger convenience. In the beginning, a sequential order was made based on user perceptions, such as the elements that encourage, deter, or urge people to board planes in the research region. In addition, they discuss the standards that they concur on or disagree with as well as the facilities that ought to be offered in terms of convenience and necessity. The survey was created in the presence of a form that the randomly selected responder would fill out in pen on paper. The survey initial try created thirty closed-ended questions. Later, rather than focusing on worldwide travel convenience, the questions were filtered depending on how relevant they were to regional travel convenience. Interviews with travelers were conducted to learn more about their perspectives and preferences.

Expert Survey

The questions were created to investigate the factors and elements that affect city airports and how they might be understood to change and apply them to their dynamic and demand. Additionally, the standards on which they concur or dispute, together with the conveniences and necessities that ought to be offered. The interview questions were prepared in writing on a paper sheet, then presented verbally so that participants may respond and express themselves as they saw fit. Brief interview questions were prepared based on expert discussions to develop features, elements, criteria, and components of developing verticality for airport expansions based on the final attributes.

RESULT AND DISCUSSION

Data Analysis from Respondent Survey

The questionnaire survey for the pilot study was completed by fifty people, the majority of whom were under the age of thirty and all of whom were female. They are all local frequent flyers due to related work field. Half of them reside around Kuala Lumpur, which 66.7% often travel to. Private vehicles and public trains (KTM, LRT, and MRT) are polled as the best travel options to their daily destinations. Over 66.7% of them chose take plan annually, which usually lands in West Malaysia, Singapore, and Thailand for the purpose of vacation. All of them (66.7%) said they taxi or grab car to reach airport by avoiding traffic and that they do not want to park their car in the airport. Additionally, almost half of those polled were less satisfied with the journey travelling to the airport due to its inconvenience (33.3%) and long-distance travel (66.7%). They also believe that issues will be resolved if an airport is proposed to be placed in the city center (83.3%). For section B (83.3%) of them have not heard of eVTOL and eSTOL aircraft. Nevertheless, the same amount of them acknowledges them as future Air Taxi or Air Bus. 66.7% of respondents are more willing to accept this modern technology due to the reason of safe time, efficient travel, convenience, cheaper for short distance travel, and safe for environment. In section C, they also agreed that proximity to destination, access to shared mobility services (bus/taxi services) are more crucial than alternative transportation options, proximity to transportation hubs and low transportation fares for access and connectivity factors. Restaurant, cafes, and temporary accommodation (capsule hotel) are rate to be the main amenities and facilities provided in the future sky port compared to amenities like duty-free retails, plaza, event spaces, and other logistics services (pos office, banking services, lockers, etc.) All factors are essential under cleanliness and comfort of a future sky port which consist of greeneries, adequate illumination and lighting, cozy and comfortable environment, cleanliness and well maintained, spacious and wide lounges. Concerns on the safety and security factors of future sky port is the obstacles along the approach and departure path of aircrafts are placed above than other factors like surrounding historic building and heritage protection, adequate security checkpoints, distance from special sites (hospital, schools etc.) and noise protection. Punctuality and fast travelling factors are rate highly significant in arrival and departure time information board, fast lane and self-check-in equipment and improvement in urban air mobility control law instead of passenger flow control and efficient flight routes.

Data Analysis from Expert Interview

On the other hand, six people were carefully picked to form an expert group and were surveyed; all of them are aviation specialists, with 66.7 percent (4 people) specializing in aircraft engineering and drone training. Two of them are private practitioners, and the other four are academic. Three of them are drone instructors. None of the respondents have finished projects in the study area. For section F, participants agreed that future sky port are best fit for placing in urban/suburban areas compare to rural areas due to reason that urban citizen have more air mobility demands and more connected to other major township. Five of the experts prefer eVTOL and eSTOL aircraft over other available public transportation options for regional air mobility. They also believe that these aircraft as an alternative for usual ground transport to solve congestion issues. For section G, most participants agreed that proximity to destination and transportation hubs (KL Sentral) are more

significant than access to shared mobility services (bus/taxi services), alternative transportation options, and low transportation fares for access and connectivity factors. Restaurant, cafes, and logistics services (pos office, banking services, lockers, etc.) are rate to be the main amenities and facilities provided in the future sky port compared to amenities like duty-free retails, plaza, event spaces, and other temporary accommodation (capsule hotel). Cleanliness and well maintained are considered crucial factors compared to other cleanliness and comfort features of a future sky port which consist of greeneries, adequate illumination and lighting, cozy and comfortable environment, spacious and wide lounges. Concerns on the safety and security factors of future sky port is the obstacles along the approach and departure path of aircrafts and adequate security checkpoints are placed above other factors like surrounding historic building and heritage protection, distance from special sites (hospital, schools etc.) and noise protection. Punctuality and fast travelling factors are rate highly significant in fast lane and self-check-in equipment instead of arrival and departure time information board, passenger flow control, improvement in urban air mobility control law, and efficient flight routes. Design and planning factors are more concern on generating new forms of urban planning, prototype and modular design and repurposing of existing buildings considering fire code etc., in compared to redevelopment of old transport and mobility hubs, open plan and flexible building space, and sense of place in future sky port around Kuala Lumpur area. Promote great efficiency with affordable to lower fares, affordable form of quick access and efficient transportation from one point to another are executive summary on promoting a more effective and friendly experience to create sense of place in future public transportation hubs. Another piece of advice was given from drone academy, eVTOL and eSTOL have the potential to offer a faster, more efficient, and environmentally friendly mode of transportation for urban commuters. However, to encourage passengers to choose eVTOL and eSTOL aircraft as their preferred mode of transportation, several factors need to be considered. Firstly, the cost of transportation must be affordable for the masses to provide the benefits of lower emissions and urban congestion. This mode of transportation will not be able to benefit the city if only a small group of commuters can afford it. It is also important to consider partnerships and collaborations with local governments, airports, and transportation authorities which are crucial for the successful integration of eVTOL and eSTOL aircraft into the existing transportation infrastructure. This will involve ensuring that the necessary infrastructure is in place, such as landing pads and charging stations, and that the necessary regulations and safety standards are met.

CONCLUSION

The obstacles and difficulties encountered by passengers have been discussed in this study. Users of multimodal public transport have been chosen as samples to gain first-hand knowledge of future cities' systems, the quality and quantity of which can vary from Malaysia's public transport systems. The data gathered and analyzed demonstrated that operators and regulators of aviation might be advised of several improvement opportunities. In summary, this study has helped identify priority regions and phase out attributes for Kuala Lumpur City Center, capital of Malaysia over the course of the next two to 10 years. The design of a new airport should be evaluated and assessed within a wider context as the entire urban form in Kuala Lumpur, Malaysia to ensure better connectivity between city to airport become more comprehensive, integrated, and coordinated. The more modern, seamless, connected, and coordinated aviation based public transport system, capable of drawing more patronage and ensuring a more sustainable economic and social growth, is one of the key improvement areas if Kuala Lumpur or Malaysia is to realize the vision 2020 of becoming a developed nation. More research is therefore required in areas like: Identifying additional issues and problems related to aviation and e-hailing services, such as outdated physical, rolling stock, inconsistent and ineffective engine, propeller repairs and overhaul services, low morale among staff and workers of operational services, as well as the dispersed regulation and monitoring of public transport services in Kuala Lumpur, other than capacity, scheduled arrival and departure of aviation service, and passengers' perceptions of satisfaction levels, the evaluation of service performance. Route expansion, irregularities and anomalies in aviation service departure and arrival, the growth of passenger catchment regions, and the successful integration of interchange facilities and ticketing systems were among these service delivery performances.

ACKNOWLEDGEMENT

I would like to express the deepest appreciation and gratitude to people around who have provided invaluable guidance and resources during the research process on this study.

First and foremost, I would like to convey my earnest appreciation to my research supervisor, Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd. Noor. for offering the chance and support. He has given a whole new perspective, vision, and motivation with his experiences, valuable guidance, supervision, insightful comments, and advice throughout this study. With guidance and persistent help, this study managed to be completed more effectively. I am also thankful to the faculty office at the Faculty of Design and Architecture of Universiti Putra Malaysia for their feedbacks and assistance during the study.

Also, wish to express my gratitude to my studio tutors, Ar. Sarizal Yuzman and Ar. Lam Shen Fei for broadening my dynamism, offering vast knowledge in aviation and architecture fields in completing this study.

Thanks to PTPTN for the sponsorship of this study. With the resources, it provides me the opportunity to manage and to be more focused on this study.

Lastly, I am ever grateful for my parents' continuous love, prayers, care, and sacrifices in supporting me to conduct this research.

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EXPLORATION OF CINEMA ARCHITECTURE TO RESURGE CINEMA AS CULTURAL LABORATORY IN MALAYSIA.

Deepankursingh GOWD, Mohd Zairul Mohd Noor

ABSTRACT

Malaysia is known for its plethora of cultures, traditions and identity. Similarly, so does its cinema industry which has been existing for almost a century. The cinema theatre was a place and space where people of all ages meet and engage for entertainment. As the audience keeps growing, cinema halls are moving in shopping malls where more modern and bigger halls are being built to amuse people in both shopping and entertainment and the cinema theatre are closing down. These theatres were once an integral part of the urban fabric of the community and country. So the architecture of the cinema provides a character, identity and culture where which it acts a catalyst to a socially sustainable society. To address this, architecture and cinema are used as two integral elements of sustainability principles on the social dimension consisting of equity and social identity, aesthetic and comfort. The study will conduct a qualitative research to explore the cinema architecture as a platform to promote the development of film culture and to investigate about the architecture strategies that can be incorporated in a cultural hub. Furthermore, the study will present a framework for a new cinema architecture which aims to reintroduce the cinema theatre as a cinema cultural hub for the present and future generations and give a new perspective to the way of how the cinema theatres outside the shopping mall. In summary, the study presents a research on a new approach to cinema architecture and interaction with the urban fabric and community. The research focuses on how cinema theatre outside of shopping malls and the sustainability and criteria of cultural entertainment with the design of cinema theatre and operational guidelines and mechanisms to use in cinema architecture in the urban development and community.

Keywords: Cinema architecture, cinema cultural hub, urban fabric, film culture.

INTRODUCTION

Cinema has always been a part of people's lives. It is a medium that can engage, educate, entertain and influence audiences. It also provides cultural representation and inspiration to people. Roger Ebert, film critic, says cinema is one of the most powerful form of art in the world. It changes the way we think, we feel and the way we see the world. (Ebert, 2012). Cinema has introduced a realm of fantasies, realism, and drama, social and sometimes controversies to the society.

With newly found form of entertainment, cinema theatres were created in the 19th century to bring people into this new and unknown space of moving image and transport them across the world into different times and places. (Aramide Tinudu, 2018). The first cinema halls known as Nickelodeons, where patron and audience members would pay a nickel to attend a show and 'Odeon' is the greek word for theatre. In the mid 1930's, the evolution in the architecture of the cinema theatre was influenced by the culture and class of the community where the rich and the poor seated on different levels to show the difference. Movie palaces were rapidly being built across the United States and United Kingdom. These palaces were opulent, extravagant and luxurious while the working class were forced to attend lower grade cinema halls with minorities or attend after the showing for upper class people on late nights. (Aramide Tinudu, 2018). By the end of the 1930's, a new trend of cinema came into place – Drive-In cinemas – because of the great depression many traditional theatres closed and the only form of entertainment during this tough period for families were drive-in cinemas which were far more cheaper than traditional cinemas. (Shaw-Smith, 2009). The architecture of drive-in cinemas was basically an open field in a fan shape accommodating up to 400 cars. (Segrave, 2006). Subsequently, in the 1960s a new cinema culture was formed because it became more convenient for people to go see a movie. People would virtually be in a theatre as the cars transform into a private theatre box. People were free to talk, bring children and come with the whole family and contemplate a movie at their own comfort. (Shaw-smith, 2009).

One of the main purpose of the emergence of drive-in cinema was to show movies as an exhibition to people living in rural or located far from traditional cinemas. However, with rapid urbanization and increase in land values, the drive-in cinemas were diminished. (Segrave, 2006). Consequently, multiplexes were built which accommodated more people and more screenings at different times of the day. This attracted more audience members at a fair ticket price. The growth of multiplex cinema was largely motivated by the profits made at a large scale. Multiplex cinema followed an Art Deco architecture with neon lighting to entice movie-goers to go watch films. The Art deco movement and multiplex cinema have created an identity of cinema multiplexes through the architecture.

Background Study

Homogeneity of cinema architecture

The intricate relationship between cinema and the city, which can be also defined as the relationship between the urban fabric and the cinematic space has been established since the early 1930s when the first cinema theatre was built. In the years of the 1980's, multiplexes moved to shopping malls where developers were using cinema theatres to seduce people to visit the malls. Moreover the technologies used were more modern and the shopping malls could house more screens than ever with more parking facilities. This attracted more people along not only for the cinemas but people came for other leisure facilities which made the malls more lucrative (Christof Papousek, 2019). However, the modern architectural style became homogenous and dull with no exterior or interior articulation like the standalone multiplexes which had an architectural and cultural identity, hence the film and cinema culture. Nowadays all the cinema are the same.

Film historian Thomas Schatz argues that multiplexes have actually expanded the range of movies available to audiences, providing more opportunities for independent and foreign films to find an audience (Schatz, 1996) but these multiplexes do not express the feeling of a cinema theatre. They have become auditorium halls only showing films on a screen. Scholar Robert Rosenstone argues the young generations are not growing up with an appreciation of film culture as a coherent entity, they see films as individual works rather than as part of a larger culture. (Rosentone, 2009).

Cinema Culture

The rise of digital media coincides with the demise of cinema culture. The availability of online platforms and streaming services has given people more choices than ever for watching movies and other types of media. As a result, many individuals no longer place as much importance on the traditional movie theatre experience when watching a movie. Film critic Richard Brody wrote the

long term shift towards home viewing has worn the movie experience and with it the audience's sense of the importance of movies. (Brody, 2016). After the COVID-19 pandemic, people are flocking towards cinemas but as a means of escapism from the harsh everyday life, hence the importance of film culture is diminishing. Additionally, online streaming services have taken over the film culture and cinema going culture over the world. A 2017 study in the Journal of Health Psychology found that "watching television, including binge-watching, was positively associated with higher levels of sedentary behavior affecting the social sustainability on the society.

To attract audiences and bring back the film culture and cinema-going culture, innovative approaches such as boutique cinemas which serves another class of cinema. It is the modern cinema palaces; adorned with luxurious seating, latest technology and restaurant-like refreshments. However, from my observation, only the interior articulation of the cinema is trying to speak of film culture while the exterior is either the entrance in a shopping mall or a retrofitted shop house. Film critic Peter Bradshaw argues that boutique cinema can lead to a sense of exclusivity and elitism. He writes, "The boutique cinema boom has created a culture of self-congratulation among certain film-lovers, who treat themselves to the 'finer' things in life, and whose tastes have been pandered to by the growth in expensive boutique cinemas."

Social sustainability

The demise of cinema-going culture is increasing due the homogeneity of cinema theatres and streaming services. This is having a repercussion not only on the film culture but also on the social sustainability of the Malaysian society and the architecture through which identity and culture is seen and experienced. Cinema theatres used to be a culture laboratory for Malaysia. The demise of film culture can lead to a reduction in social cohesion, as people become less connected and engaged with each other. Hence, can lead to a loss of cultural identity, as cinema becomes homogenized and fails to reflect local cultures and traditions. Currently there are no studies being conducted on how film culture can be resurged through architecture – the future of cinema theatre and culture could lie in the evolution of its architecture. With the evolution of the architecture of cinema theatres, the urban space around also evolved with and made cinema theatres as the center of social sustainability, identity, entertainment and culture. This had an influence on the people, whereby they could relate to the culture and identity created. The only measures theatre companies are taking are boutique cinemas to create social conditions and cultural practices to experience cinema better than multiplex cinema.

Problem Statement

Malaysia is a country with a rich cultural heritage and a diverse population. However, when it comes to cinema architecture, there seems to be a lack of diversity and homogeneity in design. Many cinemas in Malaysia have a similar look and feel, with little variation in their design and layout. This lack of diversity in cinema architecture is a missed opportunity to showcase Malaysia's unique cultural identity and architectural heritage. Instead, cinemas in Malaysia often look like generic multiplexes found in other countries, with little to distinguish them from one another. While there are some exceptions to this trend, such as the iconic Coliseum Theatre in Kuala Lumpur, which has a distinctive Art Deco design, these cinemas are few and far between. The majority of cinemas in Malaysia are designed to be functional and efficient, with little consideration given to their aesthetic appeal or cultural significance. This homogeneity in cinema architecture is a reflection of broader trends in Malaysia's built environment. As the country has developed rapidly in recent decades, there has been a focus on modernization and efficiency, often at the expense of cultural heritage and identity. To address this issue, there needs to be a greater emphasis on incorporating Malaysia's unique cultural identity and architectural heritage into cinema design. This could involve working with local architects and designers to create cinemas that are both functional and aesthetically appealing, while also reflecting Malaysia's diverse cultural heritage. By embracing Malaysia's cultural identity and architectural heritage, cinemas in the country could become not just places to watch movies, but also cultural landmarks that celebrate the country's rich history and diversity.

Research problem

The lack of diversity in cinema architecture represents an opportunity ignored to highlight Malaysia's distinct cultural character and architectural heritage. The majority of Malaysian cinemas are constructed to be practical and efficient, with no consideration for aesthetic appeal or cultural importance. This outcome is also partly due to the lack of the national architectural identity in Malaysia. Most of the architectural style are imported or influences from previous colonisers in the past and hence continued till modern times. (Hussain, 2015; Ismail, 2018; Mohd Rasdi, 2005).

Multiplex cinema in Malaysia are expanding and the number of silver screens is increasing from year to year. However, they are tarnishing a film culture by offering homogeneity in cinema architecture. There is no film sense or feeling or welcoming entrance in the standard multiplex cinema found in the malls - every multiplex is the same. There is no distinct difference between the shopping mall environment/ space and space of the multiplex. The shopping malls are using cinema to lure people to visit and go home buying unintentional items. Furthermore, with the boutique cinema growing up to lure another status of people under the guise of promoting film culture recreating feeling of movie palaces to experience state of the art screening hall, fine dining and luxurious night out at a private cinema. Overall, a lack of consideration for cultural heritage and identity, a focus on modernization and efficiency, and a lack of research on the topic have all contributed to the homogeneity of cinema architecture in Malaysia. Additionally, the majority of studies on cinema architecture are concentrated on Western countries, with little research on the topic in Malaysia. This lack of research has contributed to a lack of understanding of the importance of incorporating cultural identity into cinema design.

Research Questions

MAIN RESEARCH QUESTION: WHAT ARE THE MAIN CHARACTERISTICS OF A CINEMA CULTURAL HUB IN MALAYSIA?

RQ 1: How can cinema architecture facilitate cultural events, collaborations, and community engagement to foster film culture in Malaysia?

RQ 2: What architectural design elements and strategies that can be incorporated into cinema complexes in Malaysia to create a cultural hub that enhances the cinema-going experience?

Research Aim and Objectives

AIM: The research is to find out how the homogeneity of cinema theaters is affecting the film culture and cinema-going experience in Malaysia; along with proposing solutions and recommendations from case studies.

Objectives:

RO 1: To explore how cinema architecture can serve as a platform for cultural events, collaborations, and community engagement to promote the development of film culture.

RO 2: To investigate on architectural design elements and strategies that can be incorporated to create a cultural hub that enhances the cinema-going experience in Malaysia.

Significance of Research Research Contribution

The purpose of the study on cinema architecture and the homogeneity of cinema theatres in Malaysia is to show how due to westernization and evolution in the cinema industry, the significance of cinema architecture and cinema design has been declining and has taken a more homogenous design direction to fulfill the economical portion of having multiplex cinema for people. Consequently taking the soul and effervescence of the film culture of Malaysia and cinema-going experience. Some of these events are being offered by boutique cinema where it can be often experienced by people who can afford those services.

Benefits of research

This research will assist to generate new knowledge about how the film culture can be improved

through cinema architecture and create a cultural identity in both the social and urban fabric. It will also illustrate how the cinema-going experience can be enriched through cinema architecture where one and all of present and future generations in the community and country can experience the film culture and cinema-going wholeheartedly. Moreover, research on how sustainability can improve cinema theaters in the social, environmental and economical aspect respectfully.

Scope of Study

The study will highlight on the issues of homogeneity of cinema architecture in the new age and the challenges to change and improve the cinema architecture in Malaysia. The research will emphasize on different methods and examples to resolve to re-create a film culture in Malaysia whilst importing and learning different cultures from abroad. The findings could provide inspiration for a strong foundation to create the film culture which Malaysia has been lacking for years and therefore promote the local films and artists to the community. The study also focuses on how cinema architecture influences cultural identity as well as the social and urban fabric of the country. Designs and observations extracted from case studies and expert opinions might be advantageous to create film culture and cinema-going experience through cinema architecture therefore establish a valuable connection with the community and audiences.

Limitation of Study

Homogeneity of cinema architecture and film culture in Malaysia is not a subject which is very much talked about. Recently with the few growing boutique cinema in Malaysia, the attempt of bringing cinema architecture and film culture is being made, where fine dining and cozy seats are provided for a cinematic experience. However, the cinema architecture where cultural identity and film culture are fused together where it creates a cultural laboratory for the society is yet to be seen. There are no studies which have been made regarding this issue. The number of articles and publications about socially engaging cinema culture in the community is very limited. Moreover, there are no existing established institute to improve on to research upon. Due to lack of resources and time constraints, the study will need to be focused on a small target group of mixed age between 20 and 50 years.

LITERATURE REVIEW

History and Evolution of movie theaters in Malaysia

The notable movie theaters were being established in the 1930s, Malaysia was quite ahead in the medium of entertainment. The seeds of cinema came in the form of traditional performing arts in Malaysia. Wayang Kulit (Malay shadow play) was one of the first form of entertainment with a theatrical story telling using made up characters. It was an exciting play of light which brought people together to watch an animation on a translucent screen. This was the first form of movie theatre that Malaysia have had around 200 years ago which brought a cultural substance to the lives of Malaysian (Muthalib, H. A. (2017). From Shadow Play to the Silver Screen: Early Malay(sian) Cinema. In N. Deocampo (Ed.), *Early Cinema in Asia* (pp. 240–254).

In the 1930s, Art Deco was the architectural style that influenced the design of cinema theatres as it made its first appearance in the 1920s. Despite being short-lived, it made its marked in the cinematic landscape. The architects of the time were inventive in their design approach. Art Deco architectural style as it was the trending style to symbolize wealth and sophistication during the era. The style also influenced Malaysia's early cinema architecture as they were imported by foreign cinema chains such as Odeon, Rex Cinema, Capitol Theatre One of the first movie theatre to adopt the architectural movement was the Coliseum Theatre in Kuala Lumpur in 1928.

Multiple-screen theatres were introduced over time to accommodate a larger number of audience members. Nat Taylor, the owner of the Elgin Theatre in Ottawa, Canada, pioneered dual screen theatres capable of showing two different films simultaneously in 1957. Nat is credited with inventing the multiplex/cineplex. He later founded Cineplex Odeon Corporation and opened the Toronto Eaton Centre Cineplex, which housed 18 screens at the time and was the world's largest cineplex. (Historica, 2011). Beginning in the 1960s, multiple-screen theatres became the norm, requiring many existing theatres to be retrofitted to accommodate multiple halls. During this time,

most single-screen theatres are losing business, leaving some to be used for small scale screenings, arthouse films, film festivals, and other events.

TGV (Tanjung Golgen Village) Cinema was formed in 1995 and pioneered the Malaysian period of multiplex in shopping malls, beginning with 1Utama, which has 10 screens. Right after, GSC (Golden Screen Cinemas) was created in 1998 from the merger of Golden Communications Circuit and Cathay Cinemas (Chan, 2007), and finished the largest multiplex in Malaysian mall in 1999, located in Mid Valley Megamall, which houses 18 screens. Since then, single-building cinemas in Malaysia have diminished, with cinemas serving as anchors for commercial malls becoming the norm.

Cultural significance of movie theaters

For over a century, movie theatres have been an important cultural institution, bringing people together to experience the magic of film. The first movie theatres were built after urban dwellers accepted cinema as a cultural activity and a means of socialization (Üstün, B. 2018). Movie theatres are one of the many types of buildings with cultural significance which add to a community's character, quality of life and raise a sense of pride for residents in communities. Neighbourhood movie theatres have been an essential component of the movie-going experience for the citizens of Vancouver since the 1930s. (GVRD, 1995). Cultural Importance of cinemas may be considered cultural landmarks that hold a special place in the community. For example, a cinema that has been operating for several decades may be a cherished part of the neighborhood's history and identity, and patrons may feel a sense of loyalty and attachment to the cinema as a result.

Noel Brown's study "The impact of Cinema on Social and Cultural identity (2013)" argues that cinema is not simply a form of entertainment but also a powerful tool to shape cultural identity and influencing social attitudes. Going to the movies is more than just watching a movie; it is also about the experience of purchasing a ticket, entering the theatre, watching the movie, and exiting the theatre (Reiser, 1986).

Socially, movie theatres in Malaysia have always been a popular place for people to gather and share an experience. Going to the cinema has long been a favourite pastime for Malaysians of all ages, allowing families, friends, and couples to escape their daily routines and immerse themselves in the world of cinema. The communal experience of watching a movie in a darkened theatre with strangers can foster feelings of belonging and community.

Influence of movie theatres on cinema-going and film culture

Cinema architecture has had a significant impact on cultural geographies, particularly in terms of the evolution of film culture and its place in contemporary society. The design of cinema theatres has contributed to the development of cinema-going and film culture and the emergence of the cinema as a key cultural institution. In "The Place of Cinema in Contemporary Culture (2003)", author Mark Jancovich explains Cinema architecture has created a sense of community around cinema-going, which is critical for the growth of film culture.

In recent years, cinema architecture has been often used as landmark buildings, designed as iconic buildings and recognizable structures that defines the identity of a city and evokes a film culture which subsequently encourage people of the town and country to cinema-going culture. The Grauman's Chinese Theatre in Hollywood, California, is one of the most famous examples of cinema architecture used as a landmark building. The Chinese-inspired design of the theatre, which was built in 1927, includes ornate carvings, colourful tiles, and a pagoda-style roof. With its famous courtyard featuring the handprints and footprints of many Hollywood stars, the theatre has become an iconic symbol of Hollywood and a popular tourist attraction. (Grauman's Chinese Theatre, The Chinese Theatre's official website).

Multiplex theatre impact on film culture and social sustainability

Multiplex cinemas quickly acquired popularity and expanded around the world. Multiplexes

became more widespread in the United States and Europe in the 1970s and 1980s, owing to factors such as suburbanization, changes in urban planning, and advances in cinema technology. The expansion of multiplex cinemas expanded further in the 1990s and early 2000s. The introduction of digital projection technology and stadium seating, as well as increased amenities such as larger screens, more comfortable seats, and improved sound systems, improved the cinema-going experience (Maltby, 2004).

Malaysia has seen tremendous growth in multiplex cinemas, particularly in urban areas, throughout the years. Golden Screen Cinemas (GSC), TGV Cinemas, and MBO Cinemas have increased their presence in cities by providing modern facilities and several screens (Lau, 2020). Cinema exhibition is strongly linked with shopping malls in Malaysia, with many cinemas housed within these commercial complexes. Cinemas in malls provide convenience for moviegoers, but it also raises worries about the impact on urban cinema culture and the entire urban environment (Nasir et al., 2017).

Despite the evolution and progress made in cinema industry through implementing multiplex cinema in shopping malls, the emphasis of social sustainability has continuously been put more on the social sustainability of shopping mall. Brent and Labuschagne (2006), describe social sustainability as the weakest pillar of sustainable development which is why most multiplex cinema theater are primarily used to attract people so as to make the shopping malls successful, consequently encouraged a homogeneous cinema architecture. The fact that cinema in shopping malls cannot contribute to the film culture and urban cinema environment as much as they should is because they are typically enclosed within the mall complex, detached from the surrounding urban context. This lack of integration can hinder the development of a vibrant and diverse urban cinema culture.

According to Sorkin, M, since shopping malls prioritize retail spaces, it leaves limited spaces for cultural spaces around the cinema. This reduces the potential for cinematic community engagement which are integral to the culture of film culture and social sustainability. Moreover, multiplex cinemas' dominance and standardised approach have contributed to a loss of cultural identity, particularly in locations with significant local film traditions. The emphasis in multiplexes on mainstream films and global blockbusters might reduce the exposure and enjoyment of local and alternative filmmaking. This has the potential to reduce cultural variety and homogenise movie cultures (Ritzer, 2012).

Experiencing sense of place in Cinema Architecture

Creating a sense of place in the design of cinematic architecture is crucial as the physical environment engages the senses and contributes to the overall cinema experience. Moreover, in architecture, there is the idea of hierarchy of senses where certain sensory experiences have bigger influence than others in molding our perception and experience in architectural spaces (Pallasmaa, J. 1996). The cinematic experience of senses of place in the architecture differs significantly amongst the various senses and most importantly between a boutique cinema, a shopping mall cinema, and a movie palace. Our architectural experience, according to Tomková (2022), includes cognitive, emotional, and sensory experiences.

Shopping mall cinemas, on the other hand, are designed for ease of access and convenience. The cinema architecture experience in these theatres is primarily functional, with little emphasis on aesthetics. Timothy Recuber observes that recent advancements in projection technology and theatre architecture indicate that the physical and kinesthetic experience of the spectator, immersed in high-fidelity audio visual technologies, is critical. Shopping mall cinemas are designed to maximise the number of screens and seats while paying little attention to the overall aesthetic experience (Recuber, Space and culture. 2007). A shopping mall cinema's sense of place is frequently associated with the act of shopping, leading to a consumptive lifestyle (Ageza. G, Priyatna. A, R.M Mulyadi, 2018).

Cinema architecture in Malaysia plays a significant role in creating a sense of place for moviegoers.

However, the exhibition of film culture and cinema-culture is becoming less and less. To be able to experience the cinema-culture, audience members will have to visit boutique cinema to get the sense of place of the cinema and film culture. TGV and GSC cinema are offering state of the art boutique cinemas where they offer fine dining and classy seats to a very intimate cinematic experience. According to many reviewers who visited those high end luxurious cinema, they described them as eating Nasi Lemak in a fine dining restaurant and the experience was more about experiencing a luxurious moment while watching a movie rather than an exhibition of film where one can experience a new type of cinema going experience.

Furthermore, spatial layout and sense of place which they claimed to have was not there. The essence of cinema-going was not felt. The experience can be very expensive at the boutique cinemas, where which only upper class people will be able to afford experiencing (Ringgit Plus, 2016). But, regarding the experience of sense of place in cinematic architecture in Malaysia seems very scarce and expensive. Plus they do not behave like a cultural laboratory which promotes cinema-going culture.

Along with the homogenization of cinema architecture, where which it is losing its essence of providing and celebrating film culture and cinema-going culture, it is becoming less and less the cultural laboratory it usually is due to audiences changing medium of experiencing a movie. While these factors may contribute to the perception of cinema-going losing its essence, many people still value the cinema experience, and the industry continues to evolve and adapt to changing audience preferences.

From the reviewed literature it helped to come up with the hypothesis. Therefore the hypothesis is as follows:

The hypothesis suggests a Cultural Laboratory for film culture in a more sustainable approach in both its architecture and social. The idea of a having a Cultural laboratory is to cater not just for the present situations but also for the future generations who will experience the cinema culture and film culture. This concept of a Cultural Laboratory in the cinema industry could create a paradigm shift in the established cinema industry. This could attract not only local natives but also international visitors to learn more of the film culture of Malaysia.

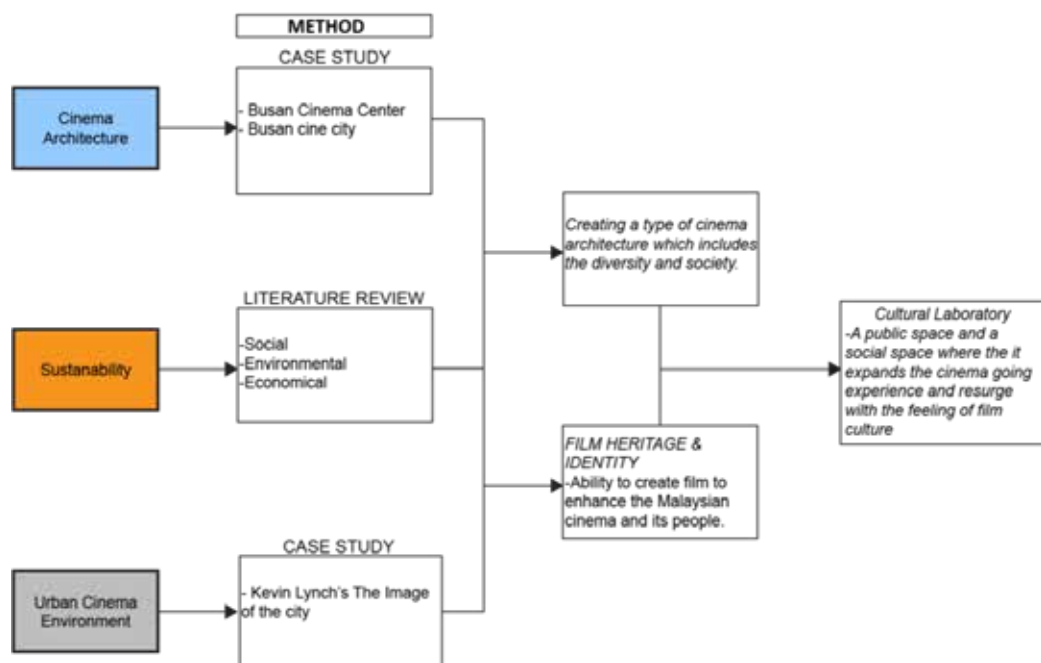


Figure 7: Conceptual Framework.
Source: Author: 2023

METHOD

Introduction

This chapter discusses the research methodology adapted in this study. The research methodology will define the strategies, approaches and techniques used to gather and analyse data, most importantly addressing the research objectives and answering the research questions. A research paradigm will be used to carry out the methodology where it will outline the overall research design, including the research methods, data collection techniques procedures and data analysis techniques (Creswell, J. W, 2014). The chapter will also demonstrate the strengths and limitations of the selected methodology.

Research Design

To effectively explore the research, a qualitative approach will be applied to delve deeper into experiences and perspectives of participants so as to identify the issues on why the cinema architecture in Malaysia does not manifest cinema-going culture and film culture as well as obtain ideas and advices on how a cinema culture hub may solve this issue. Thus, different methods of data collection will be used such as expert interview, document review and thematic analysis. The sequence of methods to be used are illustrated in the Figure below.

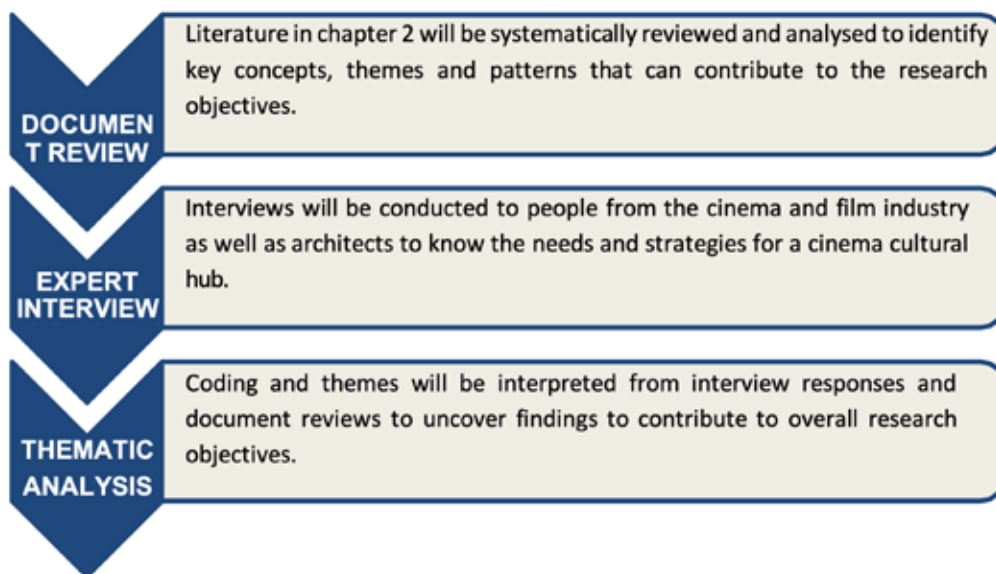


Figure 8: Sequence of Methods. Source: Author, 2023

Qualitative Research Method

Qualitative research is a method of studying the complexity and nuances of human experiences, behaviours, and societal phenomena. It entails gathering and analysing non- numerical data such as words, images, and observations in order to acquire insights into individuals' or groups' subjective meanings and interpretations.

According to Merriam, qualitative research is concerned with investigating and answering questions about the complexity and nuances of human experiences. It entails acquiring rich, detailed data using techniques such as interviews, observations, and document analysis. The purpose is to develop an understanding of the subjective interpretations, social interactions, and cultural circumstances that shape people's understandings and actions (Sharan B. Merriam, 2009).

A qualitative research is chosen to dive deeper into the issue of homogeneity of cinema architecture in Malaysia and explore how a new approach of cinema architecture can serve

as a platform to foster and promote the development of film culture and cinema-going experience. However, there is a paradox which I have observed when I visited the cinemas theatres which are coming up with spaces for social gathering and immersions in Malaysia. The immersion and

cinema architecture which are provided for people have no elements which create a cinematic experience outside the screening rooms. The way they have been designed looks more to cater about the indulgence of people rather creating a cinematic atmosphere. For that reason, a qualitative approach is being used to delve into the paradox of how cinemas are trying to create film culture and cinema-going culture through cinema architecture.

Data Collection Methods

Data collection is a critical and foundational component of qualitative research, playing a central role in the exploration and understanding of research questions. By meticulously gathering information and insights directly from participants or relevant sources, qualitative researchers embark on a journey of discovery that unravels the intricacies of human experiences and social phenomena. Creswell (2013) highlights the importance of data collection as it allows researchers to enquire about the natural setting and collect in depth information, perspectives and experiences from participants. Through various data collection methods, such as interviews, focus groups, observations, or document analysis, researchers immerse themselves in the context of their study. For that reason the methods chosen for this research are Document Review and expert interviews.

Data Collection Framework

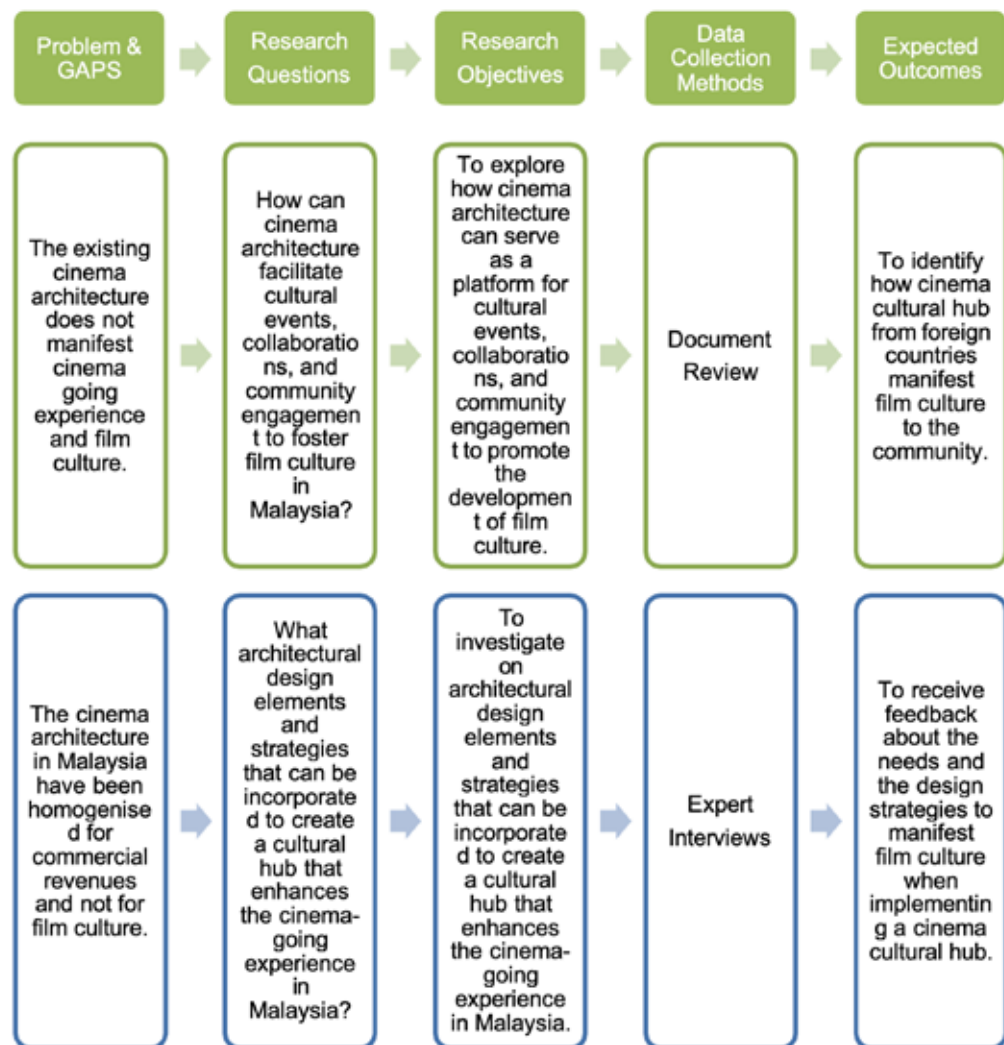


Figure 9: Data collection framework. Source: Author, 2023

RESULT AND DISCUSSION

Qualitative Data results discussion

This chapter presents the results and analysis of data collected for this study. Since the aim is to create a design framework to make cinema architecture as a cinema cultural hub in Malaysia. Data was collected to enquire about cinema architecture as a platform to promote the development of film culture and to investigate on the architectural design elements and strategies to create a cinema cultural hub in Malaysia.

Table I: ANALYTICAL FRAMEWORK

Main Research Question: What are the characteristics of a cinema cultural hub in Malaysia?			
Research Questions	Research Objectives	Deductive (Qualitative)	Strategy of Inquiry
Sub RQ 1 How can cinema architecture facilitate cultural events, collaborations, and community engagement to foster film culture in Malaysia?	Objective 1 To explore cinema architecture as a platform for cultural events, collaborations, and community engagement to promote the development of film culture.	• Culture • Social sustainability • Influence of cinema architecture on the urban fabric. • Cinema architecture and film culture	• Document review of Literature review
Sub RQ 2 What architectural design elements and strategies that can be incorporated to create a cultural hub that enhances the cinema-going experience in Malaysia?	Objective 2 To investigate on architectural design elements and strategies that can be incorporated to create a cultural hub that enhances the cinema-going experience in Malaysia.	• Immersive Space • Interactive spaces • Community event space.	• Expert Interview

Answering RQ 1- How can cinema architecture facilitate cultural events, collaborations and community engagement to foster film culture in Malaysia?

Document review method was used to review literature in Chapter 2, whereby passages and texts were reviewed and iteratively processed to acquire contents and extract themes and patterns with respect to the deductives and research objective.

Theme 1: Urban Cinema Environment

Based on the literature review analysis, the first theme generated shows to have a cinema culture as part of the city, the cinema architecture needs to *integrate with the urban context and complement the surrounding. It should reflect the interest and diversity of the urban population to serve as platform for cultural exchange. It should create a continuance thought a street channel or skyline.*

Theme 2: Immersive Space

The second theme demonstrates for the cinema architecture to promote film culture and cinema-going experiences, the spaces *need to be immersive so as to make people engage in a cinematic space. So, the architectural design need to follow cinematic approach in order to make the design immersive with captivation elements to pique curiosity. The immersive space should be adaptable to create various atmosphere and experience.*

Theme 3: Community Event Spaces

The third theme explains having *a sense of place plays a significant role in cinema architecture and is crucial for people to be able to experience the cinema culture and film culture in a cinematic environment. Thus this will help create a cultural infrastructure due to the social interactions. A public realm will aid the expansion of social cinema in the community.*

Table.II RQ 1 THEMATIC ANALYSIS

Sub Research Questions	Sub Research Objectives	Strategy of Inquiry	Deductive	Inductive codes	
				Coding	Final theme
RQ 1: How can cinema architecture facilitate cultural events, collaborations, and community engagement to foster film culture in Malaysia?	RO 1: To explore cinema architecture as a platform for cultural events, collaborations, and community engagement to promote the development of film culture.	Document review of Literature Review	• Culture • Social sustainability • Influence of cinema architecture on the urban fabric. • Cinema architecture and film culture	• Physical and Cultural Context. • Sense of place in cinema architecture. • Cultural Identity. • Adaptable Spaces. • Atmosphere and Experience. • Architectural design. • Social Interactions • Cinema cityscape • Cultural Infrastructure • Social Cinema • Public Realm	• Urban Cinema Environment • Immersive Space • Community Event Spaces

Answering RQ 2 - What architectural design elements and strategies that can be incorporated to create a cinema cultural hub that enhances the cinema-going experience in Malaysia?

The themes generated in the thematic analysis matrix in the RQ 1, were used as a means to create the interview questions. The themes were employed as a stepping stone to find the insights and recommendations about the architectural design elements and strategies to be incorporated to create a cinema cultural hub. The design elements and strategies for a cinema cultural hub will affect the physical and cultural context of the urban fabric and vice- versa, so they are crucial to be taken into considerations as to provide the most suitable space for the community. The theme covers the type of design elements needed for a cinema cultural hub.

Theme 1: Urban Cinema Design Strategy

Theme 1 questions required to identify the urban design and cultural infrastructure factors that should be implemented and taken into account when designing a cinema cultural hub. The cinema cultural hub in an urban context should address multiple aspects such as, accessibility for both pedestrian and vehicular, how it reacts to noise pollution and traffic congestion and the visual impact it will have in the urban setting.

“Elements and strategies that can be incorporated to create an urban cinema environment, the cinema cultural hub needs to have a visually appealing façade, easy accessibility through public transports. It must be permeable for pedestrian with many access points leading to spacious outdoor and indoor lobbies...” Ar. Sarizal Yusman

Aside of having easy accessibility, Ar Sarizal Yusman points out when designing in a congested urban area and because of the scarce size of land, noise- cancelling insulation, use sustainable green façade walls or optimize the use of vehicles on the land by separating car parks with the building.

Theme 2: Engaging environment

The second theme is about exploring the immersive spaces in a cinema cultural hub offering a highly engaging and transformative experience for visitors, whereby they serve as a platform for community engagement and cultural exchange, thus contributing to the enrichment of the local community’s cultural experiences. Mr Imran Cous, a freelance production designer and filmmaker mentioned how important and crucial those spaces are important for the development of the cinema industry and film culture in Malaysia, since there are a handful of places who try to emulate an immersive cinematic experience.

“As both a filmmaker and production designer, I think with the upcoming technologies such as Artificial Intelligence and Virtual reality, integrating those technologies in cinema architecture in pre and post screening spaces can be designed to engage and entertain the visitors beyond the movie itself. Interactive movie-related activities would encourage audience in interaction and exploration.” Mr Imran Cous

He also added integrating advanced technologies with flexible spaces will make the visitors enjoy the full impact of the immersive environment.

Theme 3: Collective venue

The third theme about sharing with the community the culture of cinema-going, film culture and filmmaking. It is required to identify the event spaces to cater for the community because these spaces go beyond traditional movie screenings and provide opportunities for the local community to come together, collaborate and celebrate various cultural expressions.

Mr Taza Mohamed Bin Ahmed mentions there is no place where filmmakers can have meet and greet as well as co-working spaces is necessary because as at now most filmmakers are isolated and many talents go unseen.

“Having a venue or place where filmmakers can collaborate to work together and create a network will be a good thing for the film industry because there are many young emerging talents who go unseen. This hub can have areas for aspiring artists to connect and exchange ideas...” Mr Taza Mohamed Bin Ahmed

Table.III RQ 2 THEMATIC ANALYSIS

Sub Research Questions	Sub Research Objectives	Deductive	Strategy of inquiry	Inductive codes	
				Coding	Final theme
RQ 2: What architectural design elements and strategies that can be incorporated to create a cultural hub that enhances the cinema-going experience in Malaysia?	RO 2: To investigate on architectural design elements and strategies that can be incorporated to create a cultural hub that enhances the cinema-going experience in Malaysia.	- Immersive Space - Interactive spaces - Community event space.	Expert interview	- Appealing façade - Accessibility - Interactive façade - Traditional motifs - Futuristic design elements - AI and VR in cinema architecture - Exploration - Interaction - Multisensory experience - Immersive flexible space - Co-working space - Production design - Idea-sharing hub	- Urban Cinema Design Strategy - Engaging environment - Collective venue

CONCLUSION

This research paper highlights the recommendations and design possibilities for a cinema cultural hub to resurge the film culture and cinema-going through cinema architecture. Using a thematic analysis for RQ 1, three themes were generated from the Document Review to create the interview protocol to get the opinions of the expert.

The findings of the dissertation have made significant contributions to the development of a conceptual framework for a cinema cultural hub that focuses on integrating immersive spaces. By creating such spaces, the aim is to attract people and encourage them to explore and engage with the rich cinema and film culture of Malaysia. This innovative approach not only aims to provide a platform for entertainment but also facilitates social learning experiences that are centered on films and cinema.

Moreover, the cinema cultural hub serves as a platform for social interaction and community engagement. By providing a space where film enthusiasts, artists, and the general public can gather, share ideas, and engage in meaningful discussions, it fosters a sense of community and collaboration. This collaborative environment encourages the exchange of perspectives, knowledge, and cultural experiences, contributing to the enrichment of the overall film culture in Malaysia.

Furthermore, the emphasis on catering to both present and future generations highlights the long-term vision of the cinema cultural hub. By adapting to the evolving needs and interests of different generations, the hub ensures its relevance and sustainability. It aims to nurture a love for cinema and film culture among younger audiences, cultivating a new generation of film enthusiasts, filmmakers, and cultural contributors who will carry forward the legacy of Malaysian cinema.

In conclusion, the findings of this dissertation have not only contributed to the conceptual framework of a cinema cultural hub that integrates immersive spaces but also emphasize the significance of providing social learning experiences and catering to the present and future generations. The proposed cinema cultural hub aims to inspire, educate, and engage individuals in the exploration of Malaysian film culture, fostering a vibrant and dynamic cinematic community.

ACKNOWLEDGEMENT

The researcher would like to give thanks and gratitude to the filmmakers and architects who accepted to be part of the research and who altruistically shared their ideas and experiences in help this research.

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PUBLIC SPACE FOR ALL: SOCIAL INTEGRATION IN CITY CENTER OF KUALA LUMPUR

Wong Jian Ting, Mohd Zairul Mohd Noor

ABSTRACT

The population living in cities has doubled or more over the last 40 years. Currently, urban densification with new buildings is confined to an individualistic approach, creating invisible barriers that limit interaction. However, the current urban densification is not developed as linked existential experiences through space for different communities, nor is it designed to promote social integration and experience for different groups of urban dwellers. This research will utilize quantitative methodology along with literature review, survey, and observation to understand the demographic, public space, their limitation, and the interactiveness element to improve on the public space. Therefore, this research will formulate design frameworks for successful public spaces to strengthen the social integration of urban dwellers in the current urban densification setting within the Kuala Lumpur city center. This study will contribute as a guideline for future development utilized by architects, local authorities, and developers. Future studies may consist of research on improving connectivity and accessibility toward successful public space.

Keywords: *public space, common space, social integration, social interaction, urban densification*

INTRODUCTION

According to the OECD (2015), the population living in cities has doubled or more over the last 40 years, and 48% of the world's population now lives in cities. Kuala Lumpur, Malaysia is one of the fastest-growing cities in Asia, with a population of 1.9 million people and has undergone rapid urban development and densification in recent decades (Johari et al., 2018). The city has seen an influx of different groups of urban dwellers attracted by job opportunities, improved access to amenities, and a higher standard of living. However, urban expansion can result in a loss of agricultural land (Samat et al., 2014).

The growth of Kuala Lumpur has brought both positive and negative impacts. It has fueled economic development, made the city dynamic and diverse in social and cultural scenes, and has improved people's livelihoods (Samat et al., 2014). On the other hand, the increase in the population has strained the city's infrastructure and resources, leading to traffic congestion and rising real estate prices. Rapid urban development has also resulted in the loss of green spaces and converting public spaces to commercial developments, leading to a significant reduction of green spaces in Kuala Lumpur (Johari et al., 2018).

Additionally, urban densification can lead to architectural neglect of the social aspect of the city, resulting in an increase in buildings and infrastructure at the expense of public spaces, green areas, and community facilities. Densification can also lead to displacement of residents, homogenization of neighborhoods, and the development of aesthetically unappealing buildings that fail to consider the cultural heritage and identity of the local community. Moreover, it can lead to social inequalities and segregation that fragment communities (OECD, 2015).

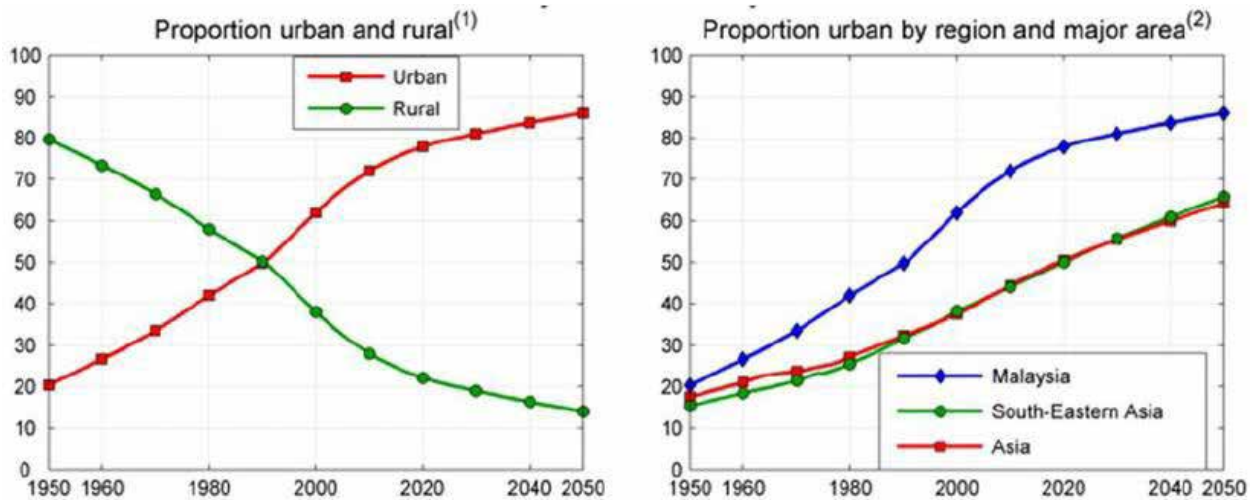


Figure 1 - United Nations, Department of Economic and Social Affairs, Population Division (2012)

Issue of Urban Densification

The rise of urban densification has caused a decrease in the number of outdoor spaces where people can interact, leading to less in-person social interactions (Beld, 2012). The lack of opportunities for social interactions in high-rise buildings can lead to isolation and a sense of disconnection (Jacobs, 1961).

This issue is further highlighted in a study that found social interactions decreased as floor levels increased in high-rise apartment buildings (Nasar et al., 1983). Such negative effects can lead to strains on community cohesion and contribute to rising crime rates. Therefore, it is crucial to create interactive public spaces in urban areas to foster social interactions and community cohesion. This can be done through the participatory approach of urban planners, as highlighted in Balakrishnan et al.'s (2014) study, which suggests that community engagement and decision-making can ensure inclusive and equitable densification strategies. Interactive public spaces can provide opportunities to cultivate social connections and trust between individuals.

Additionally, these public spaces can improve the overall quality of life in urban areas by helping to tackle the challenges of urbanization, such as limited space, population growth, and traffic congestion. Overall, creating interactive public spaces is a crucial element in ensuring that urban densification benefits all members of the community.

Public Space in Kuala Lumpur City Center

The city has undergone significant urbanization and population growth, which has led to a demand for more public spaces. However, densification has also resulted in the loss of public spaces, as development projects prioritize building structures over preserving open areas. The lack of quality and maintenance in many public spaces discourages people from using them for recreational activities.

Studies show that poor quality of public spaces is due to a lack of community engagement and participation in their design and development (Chen & Tse, 2017). The loss of public space negatively affects the city's livability, and a rethinking of urban planning and development policies is needed to prioritize the creation and preservation of public space. The article suggests that a holistic approach is necessary, which prioritizes community engagement and participation, and ensures that high-quality public spaces are available to all.

Askari (2015) conducted a study of public space in Kuala Lumpur city center, and found that many public spaces lack quality and maintenance, which discourages their use. In another study by Chen & Tse (2017), the poor quality of public spaces in Kuala Lumpur was linked to a lack of community engagement and participation in their design and development. Similarly, Chua (2009) argued that the loss of public space in Kuala Lumpur has negative consequences for the

city's livability. A rethinking of urban planning and development policies is necessary to prioritize the creation and preservation of public space.

The impact of urban densification on public spaces in Kuala Lumpur is a multifaceted issue that requires community engagement and holistic planning. It is important to prioritize the creation and preservation of public space to ensure that everyone has access to high-quality public spaces that promote the city's livability.

Social Integration in Kuala Lumpur City Center

The design of buildings and public spaces can have a significant impact on social interaction among people in urban areas. The preservation of historic buildings and local cultural heritage can foster a sense of community pride and facilitate social interaction among residents. Study by Yazid et al. (2020), suggest that community engagement is critical for promoting social integration in urban areas. In contrast, other studies, such as Saeidpour et al. (2020), propose a framework for designing social spaces that prioritize social interaction and community engagement. Elements like lighting, landscaping, and seating arrangements can create spaces that encourage people to interact with each other and build social ties in the community.

Urban planners and policymakers need to prioritize social integration in the context of densification. The World Economic Forum (2018) report recommends investing in social infrastructure such as community centers and public gathering spaces that promote social interaction and cohesion in urban areas. The report also emphasizes that providing affordable housing options is crucial to prevent social exclusion and promote inclusivity.

To promote social integration through architecture in a densified urban setting like Kuala Lumpur, community engagement, the preservation of local cultural heritage, and the design of buildings and public spaces must all play a part. Architectural interventions can be made by implementing design features that prioritize social interaction, such as public seating arrangements readily available within the public space. This approach ensures that the available space is utilized to promote social interaction and community engagement while embracing high-density development.

Promoting social integration in a densified urban setting involves a holistic approach that focuses on the preservation of cultural heritage alongside community engagement. Architecture plays a significant role in promoting social interaction and cohesion in a densified urban environment. Urban planners and authorities must prioritize investments in social infrastructure such as community centers and public gathering spaces to promote social integration and prevent social exclusion in urban areas like Kuala Lumpur.

Limitation on current Public Space in Kuala Lumpur City Center

Despite requirements imposed by the city council to have green and open spaces in new developments, the current situation of urban densification in the city center exhibits a lack of public space that promotes social interaction and integration among the various groups of urban dwellers. One major challenge in designing public spaces that promote inclusivity is the limitation of physical space, which makes it hard to accommodate the needs of diverse communities. The lack of political will and competing interests from different stakeholders also make it challenging to design public spaces that prioritize social interaction and integration. Moreover, limited funding further constrains designing and maintaining public spaces that can promote social interaction.

Research by Gehl (2010) and Subramaniam et al. (2020) both emphasize the need for developing a framework for the design of social spaces that align with the diverse needs of the community. Additionally, the design of public spaces that can be used for social integration has become an essential component in addressing social challenges faced by society in dense urban areas like Kuala Lumpur. According to Kurniawati (2012), public spaces have at least three core values of being responsive to accommodate different activities, accessible to different human physical conditions, and having meaningful linkage between humans, space, and the world at large. By developing public spaces that align with these core values, it could potentially promote social interaction and integration among the different communities in urban areas.

Despite the importance of designing public spaces that promote social interaction and integration in urban areas, existing research lacks specificity on how to design these spaces effectively. Therefore, more research is needed to develop effective strategies that can help design public spaces that cater to the unique needs of diverse communities, and promote social integration and cohesion in densely populated urban areas like Kuala Lumpur.

METHOD

Quantitative research was adopted in this dissertation because it allows for the collection and analysis of numerical data, which can be used to test the hypotheses and relationships between variables. And it can be particularly useful when the research questions involve identifying correlations between variables and making predictions based on those relationships. The following figure shows the variables:

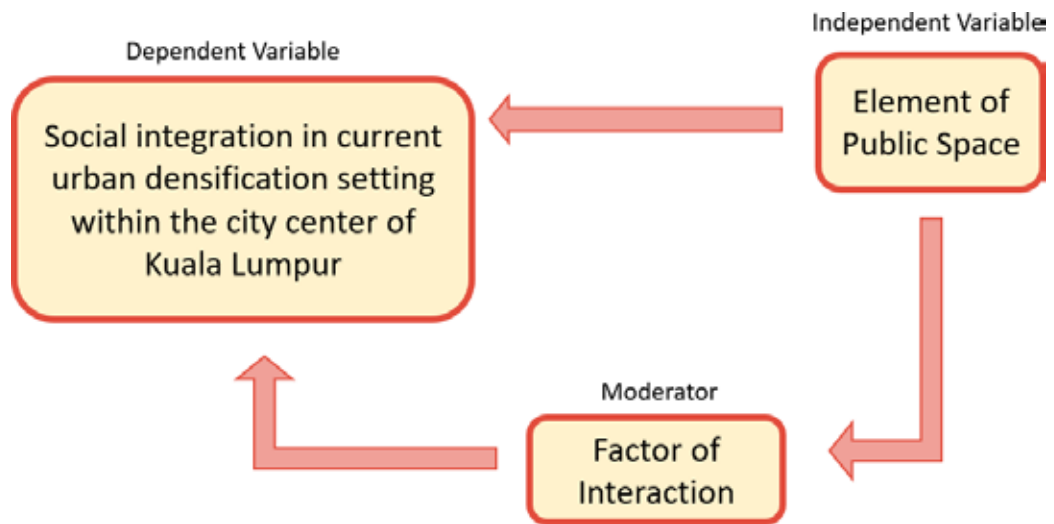


Figure 2 – Conceptual Framework of Interactive Public space. The variables for the research (source: Author)

Quantitative data collection methods were used to identify existing studies and formulate research questions, gaps, and arguments that form the research aim, research question, and research objective. Afterward, a literature review was conducted to support the research framework based on existing studies, research gaps, and argument. Next, data was collected using survey questions (quantitative method) referenced in the research framework and literature review.

The survey questionnaire, titled “Public Space in the City Center of Kuala Lumpur,” was conducted both online and physically in the Bukit Bintang area of Kuala Lumpur. For on-site surveys, respondents were approached in various locations around Bukit Bintang, including public spaces near Pavilion Kuala Lumpur, KLCC park, and eatery nodes on Jalan Imbi. Surveys were conducted on both weekends and weekdays, during morning (8am-10am), afternoon (12pm-2pm), and evening (5pm-7pm) sessions. The online survey was distributed to several companies located in the Kuala Lumpur city center, ensuring that the surveys reached urban dwellers who spent time in the area. Both on-site and online surveys confirmed this. The findings of a survey conducted on public spaces in the city center of Kuala Lumpur with the aim of identifying user perspectives on the quality and function of these spaces. The survey was distributed to individuals aged 18 years and above using a snowball sampling technique. The results of this survey provide valuable insights into the strengths and weaknesses of public spaces in the city center from the user’s perspective. These findings will be used to create a new design framework for future public spaces that incorporates social integration and interactive elements, which will ultimately enhance the overall quality and functionality of public spaces in Kuala Lumpur.

The survey questionnaire consists of a set of questions with multiple choices answers and using Likert scale. The questionnaire is attached in Appendix A, which consists of 40 simple questions, excluding respondents personal biodata that were structured into 6 segments. The question segment is as below:

Segment A: Respondents' Biodata, demographic, and social background profiles.

Segment B: Frequency of the public space in Kuala Lumpur being utilized by users

Segment C: How is the public space in Kuala Lumpur being utilized by users

Segment D: Limitation faced by the users to utilize public space in Kuala Lumpur

Segment E: Identifying level of acceptance of the user on interactive and social integration in public space

Segment F: User overall rating toward public space in the city center of Kuala Lumpur

Segment A is used to collect the social background of users of public spaces to identify their age, gender, race, and religion. Segment B collects data on the frequency of public space usage by the users to identify the tangible elements of public spaces that need to be improved. Segment C aims to understand the users' needs as described by Carr et al. (1992), who state that urban open spaces must meet five essential needs of individuals, including comfort, relaxation, passive engagement with the environment, and active engagement with the environment. The questions in Segment C focus on the users' needs for passive engagement, relaxation, comfort, and activity engagement. Segment D aims to identify specific challenges regarding the use and needs of public spaces in the city center and review the quality and quantity of public space improvements required. Segment E collects data on the level of acceptance of social integration and interactiveness within public spaces. Lastly, Segment F is an overall rating given by users of public spaces for future studies to compare after implementing the new design framework provided by this dissertation study.

The survey questionnaires in this study consisted of a set of questions, including both yes or no questions and questions seeking a level of agreement. Respondents were asked to rate their perceptions on an ordinal scale that was converted into an interval scale ranging from 1 to 5 in ascending order: 1 represents – Strongly Disagree; 2 – Disagree; 3 – Neutral; 4 – Agree and 5 – Strongly Agree.

RESULT

Demographic Characteristics

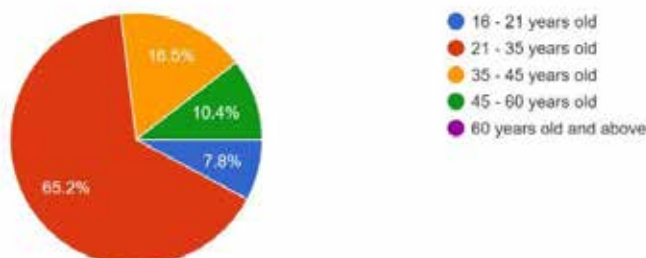
Gender

115 responses

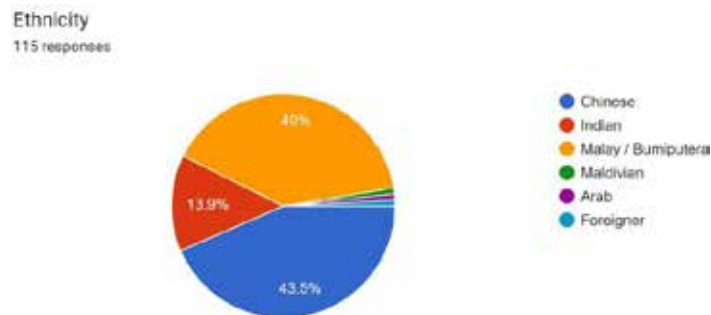


Age

115 responses



The gender balance of respondents in this survey was fairly even with 50.4% men and 49.6% women. The respondents consisted of 115 urban dwellers within Kuala Lumpur city center (58 male, 57 female) aged between 16 and 60 years. As for age, respondents from every age group were represented, however, there were fewer respondents in the older age group. A majority of the sample were aged between 21 and 35 (65.2%). Followed by 16.5% of respondents in 35 to 45 years old and 10.4% of 45 to 60-year-olds which is the research focus group that was the active age group that mingle around the city center. 7.8% of the respondents were 16 to 21 years old. None of the respondents were from age 60 years old and above.

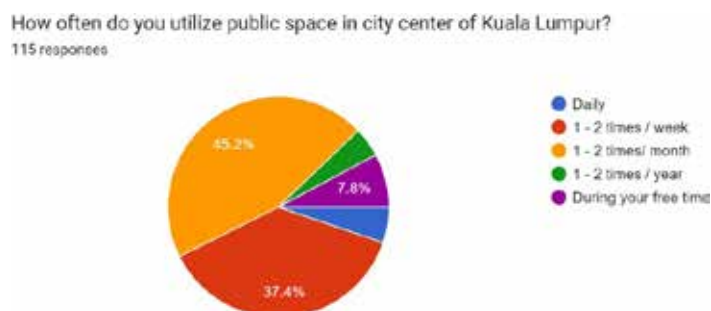


Respondent were selected based on a random sampling method of three main ethnic groups in Malaysia. The majority of respondents were Chinese (43.5%), followed by Malay/ Bumiputera (40%), and Indian (13.9%).



The respondents represented a broad range of occupations including 10% students, 16.7% housewives, 3.3% self-employed, 3.3% retiree, 20% delivery or courier driver, 10% foreign worker, 6.7% unemployed, 20% from the corporate sector, and 16.7% from the public sector.

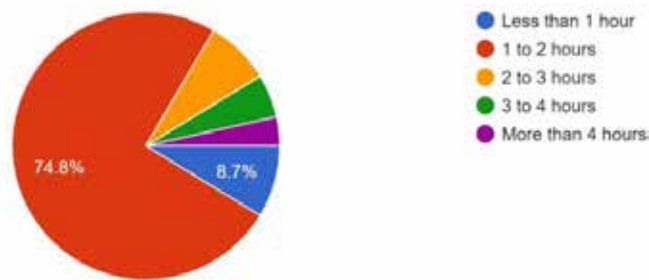
Frequency of the public space in Kuala Lumpur being utilized by users



Over 45.2% of the respondents utilize the public space in city center of Kuala Lumpur 1-2 times a month and followed by 37.4% of the respondents use 1 – 2 times a week. The remaining are 7.8% of the respondents only use the public space during their free time, 5.2% of the respondents use daily, and 4.3% of the respondents use the public once or twice annually.

How long do you usually spend at the Public Space?

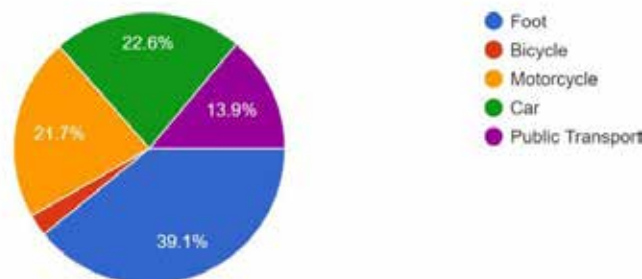
115 responses



Majority of the respondents (74.8%) tend to spend only about 1 – 2 hours in the public space and not willing to spend more than 2 hours in Kuala Lumpur city center’s public space. As for the remaining responses were almost equally distributed among less than 1 hour (8.7%), 2 to 3 hours (7.8%), 3 to 4 hours (5.2%), and more than 4 hours (3.5%).

How do you get to the public space?

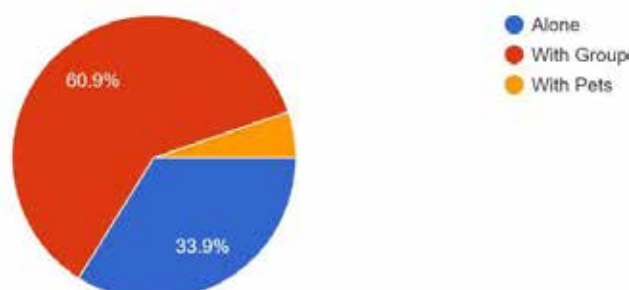
115 responses



Most of the users of public spaces in Kuala Lumpur visit these spaces by walking (39.1%%). Followed closely by car (22.6%) and motorcycle (21.7%%) as the mode of transport to access public spaces in Kuala Lumpur. Whereas only 13.9% of the respondent access Kuala Lumpur city center’s public space by public transport and only shockingly 2.6% of the public space were accessed by bicycle.

Do you visit the public alone or with companion?

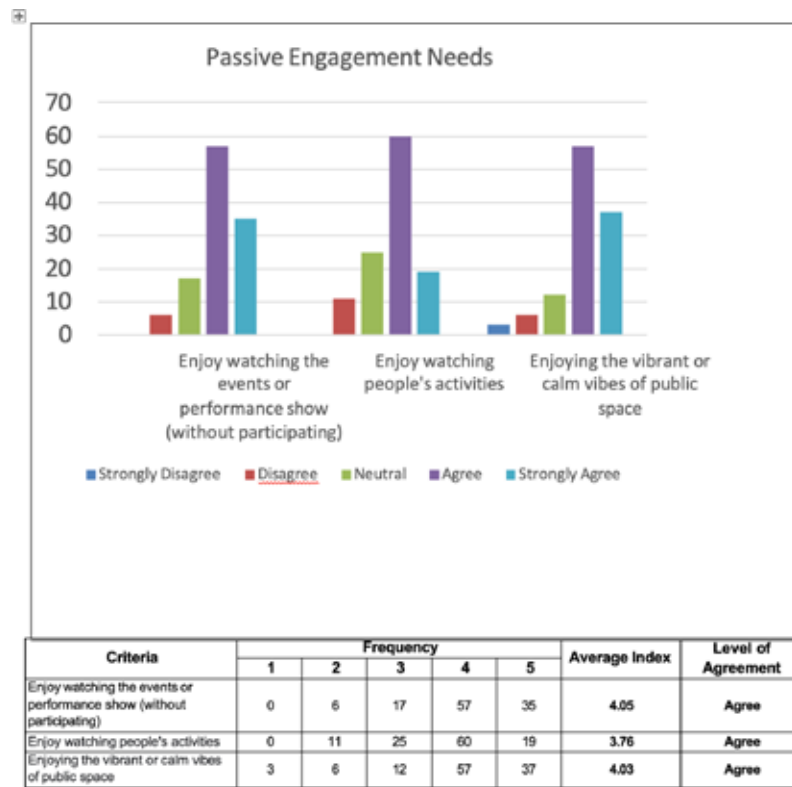
115 responses



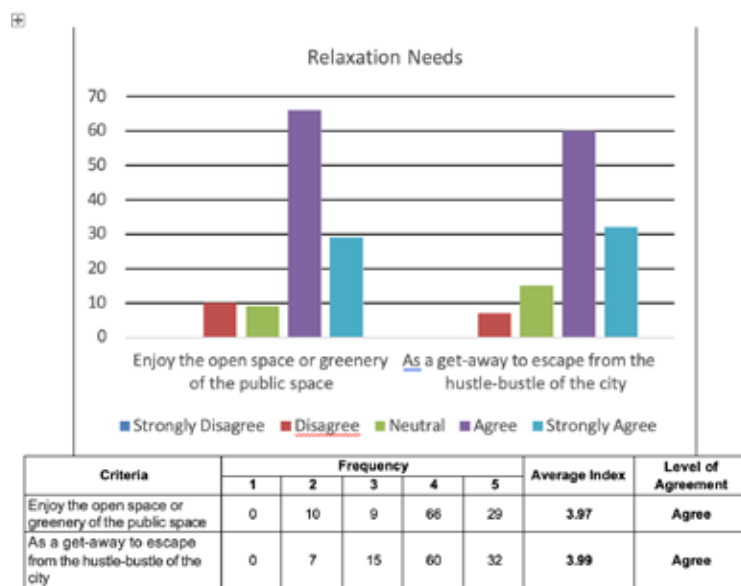
The response indicates that the public space in Kuala Lumpur is mostly visited by people in groups rather than alone. 60.9% of respondents visit the public space either with their peers or colleague. 33.9% of the respondents use the public space alone and 5.2% of the respondents utilize the public space with their pets.

How is the public space in Kuala Lumpur being utilized by users

In this segment, the 13 questions are identified into 4 categories based on previous studies, passive engagement needs, relaxation needs, comfort needs, and active engagement needs.

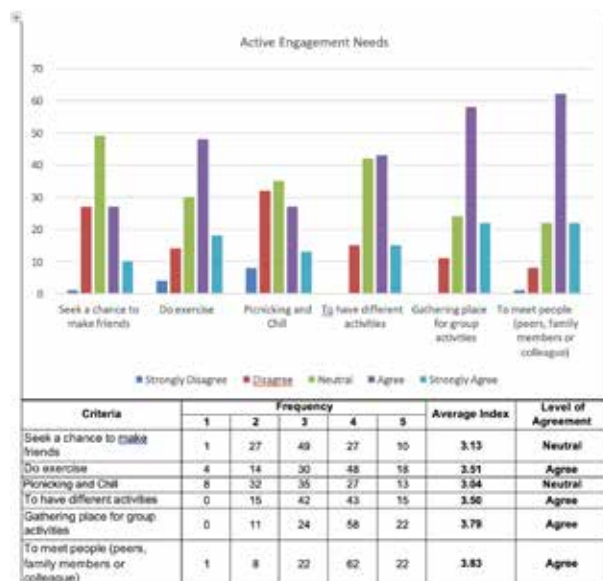


In passive engagement needs, results revealed a high frequency with the response 'agree' and 'strongly agree' for the statements 'I enjoy watching the events or performance show (without participating)' 49.6% and 30.4% respectively. The majority of the respondents agree that they enjoy watching people's activities and enjoy the vibrant or calm vibes



As for relaxation category, most respondents agreed it is for them to enjoy the open space or greenery and as a get-away to escape from the hustle-bustle from the city in the public space within the city center. There is none of the respondent that strongly disagree to the statement.

With regard to comfort needs, the results showed 48.2% of the respondents felt comfortable and had the feeling of freedom to do what they would like to do in a public space. Nonetheless, 30% of the respondents felt neutral and doubted the freedom given to do whatever activity they like in the public space. Despite the free of doing any activity they like in the public space, most respondent (57.4%) still agree that they enjoy the comfortable environment within public space.



In the active engagement needs segment, most respondents (43%) felt neutral on seeking the chance to make friends, followed by 23,7% who disagreed they seek to make friends in public space and another 23.7% who agree that they seek a chance to make new friends in public space.

Doing exercise in public space is agreed (42.1%) and strongly agreed (15.8%) by most respondents saying that is what they do in public spaces. However, data for picnicking and chilling in public space shows the respondent has different opinions on this, 27.8% disagree, 30.4% feel neutral, and 23.5% agree that they do picnicking and chilling in public space. 36.5% of the respondent felt neutral on whether they stay in public spaces to have different or unique activities in public space, and 37.4% of the respondents agreed that that's what they do and seek. Most of the respondents (50.4%) agreed that public space is where they gather for group activities and meet people (peers, family members or colleagues).

Limitation faced by the users to utilize public space in Kuala Lumpur

Salient Limitation	Parameter and Measure	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Facilities	Outdated Facilities	6	13	25	52	19
	Bad lighting	6	16	42	35	15
	Limited learning opportunity (to growth)	7	15	49	35	9
	Lack signages	5	16	43	37	11
	Unhealthy social activities	4	8	24	42	37
	Lack activity	7	9	37	42	20
Design Aspect	Uncomfortable Environments (Physically)	8	16	33	38	20
	Uncomfortable Environments (Socially)	8	16	36	36	19
	Bad location and accessibility	8	18	46	28	15
	Lack of aesthetic value. Unattractive design	9	17	39	34	15
	Crime and safety	7	15	31	35	28
	Lack of green	5	12	40	35	20
Maintenance	Unused, Underused or Abandoned	8	18	34	40	17
	Dirty and unhygienic	5	11	30	43	23
	Vandalism	4	9	32	42	28

Criteria	Frequency					Average Index	Level of Agreement
	1	2	3	4	5		
Outdated Facilities	6	13	25	52	19	3.57	Agree
Bad lighting	6	16	42	35	15	3.30	Neutral
Limited learning opportunity (to growth)	7	15	49	35	9	3.21	Neutral
Lack signages	6	16	43	37	11	3.22	Neutral
Unhealthy social activities	4	8	24	42	37	3.87	Agree
Lack activity	7	9	37	42	20	3.51	Agree
Uncomfortable Environments (Physically)	8	16	33	38	20	3.40	Neutral
Uncomfortable Environments (Socially)	8	16	36	36	19	3.37	Neutral
Bad location and accessibility	8	18	46	28	15	3.21	Neutral
Lack of aesthetic value, Unattractive design	9	17	39	34	15	3.23	Neutral
Crime and safety	7	15	31	35	26	3.48	Agree
Lack of green	8	12	40	35	20	3.41	Agree
Unused, Underused or Abandoned	6	18	34	40	17	3.38	Neutral
Dirty and unhygienic	8	11	30	43	23	3.54	Agree
Vandalism	4	9	32	42	28	3.70	Agree

The outcome from the 30 respondents on the challenges they face in the public space in Kuala Lumpur city center using the Likert scale can be categorized into 3 major categories, limitation on facilities, limitation on design aspects of public space, and the maintenance of the public. On facilities, it seems that the lack of new and appropriate facilities to facilitate the respondents. 45.2% of the respondents 'agreed' that the public either has outdated or is absent of appropriate facilities. This is supported by the 30% of the respondents agree on the facilities in public spaces limited learning opportunities for them to grow and learn and also is backed by 40% of the respondents agree that public space lack activity.

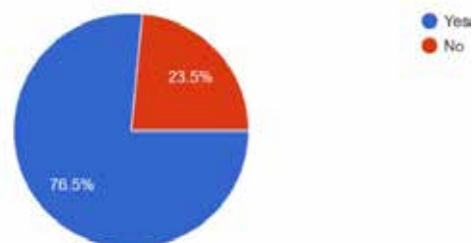
Most of the users were neutral on the design aspect of the public space. As environments of public space, location, and accessibility, aesthetic value with unattractive design, soundness, and lack of green seem to be subjective to different users. And it can be concluded that the existing design of most public are still relevant compared to the facilities, activities, and programs that were planned within the public space.

However, all of the ratings for the maintenance of the public space category are agreed upon by more than 34.8% of the users limiting them from using the public space. 37.4% of respondents find Cleanliness and 36.5% of respondents agree that vandalism as challenge for public space to be utilize, as these are the highest 'agreed' ratios among the other limitations.

Identifying level of acceptance of the user on interactive and social integration in public space

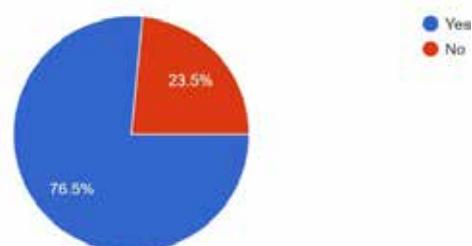
Are you comfortable with sharing the space with unknown user?

115 responses



Would you like to interact with other people in public space?

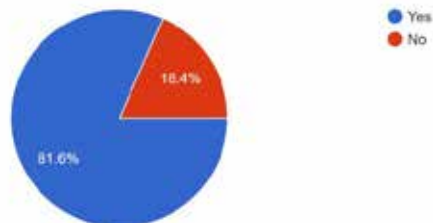
115 responses



According to the figure, it shows that the dominant percentage of the respondents, which is 76.5% of respondents are comfortable with sharing the space and interacting with unknown users. And 76.5% of them would like to have interaction with other people in public space.

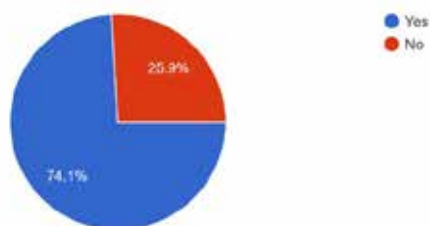
Are you comfortable with sharing the space with other user that are different race or nationality?

114 responses



Are you comfortable with sharing the space and interacting with other user that are different income level?

112 responses



The figure above, it shows that most of the respondents (81.6%) were comfortable with sharing the space with other races and nationalities. 74.1% of the respondents are comfortable with sharing the space and interact with other user that are different income level too.

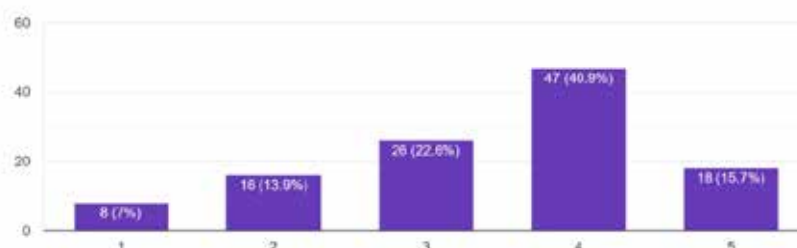
You find it easier to interact with other user that you share common topic or interest

114 responses



You find it easier to interact with other user that you share common goal or target

115 responses



However, according to the figure above, it shows that more than 48.2% of the respondents agree that in order for them to interact with other users, it required them to have a common topic, interest, goal, or target.

RESULT AND DISCUSSION

This study makes it possible to identify the pattern of the user of public spaces in Kuala Lumpur city center. It is shown that the majority of the respondents use public space at least 1 – 2 times per month or 1-2 times per week. The outcome is parallel to the city, Rotterdam reviewed in

Buchek and Frantzeskaki's (2015) article. However, it should be noted that the frequency of park use may also be related to income, although this was not tested in this study. A majority of these respondents (37.4%) use public spaces once a week. This applies to respondents from all groups of gender, age, ethnicity, and occupation. The study also found that most of the public space users were aged 21-35 (56.7%) and as age increases, the number of utilizing public spaces in Kuala Lumpur lessens.

In conjunction with the data that shows users utilize public spaces in Kuala Lumpur 1 to 2 times per week, it is highly likely that public spaces are primarily utilized by the working-class during weekdays. This is due to the fact that public spaces in the city center of Kuala Lumpur are inaccessible on foot on weekends, as the area is non-residential. because delivery or courier driver occupation occupies 20% in the overall survey.

It is common in Malaysia where most people prefer to visit parks in the company of friends, spouses or partners, and children or pets in large groups. Furthermore, Malaysian females also prefer to visit the park in a group because they tend to feel safe when accompanied by their husbands, other family members, and acquaintances (Sreetheran and Van den Bosch, 2015).

Regarding the quality and quantity of public space in the city center of Kuala Lumpur, Carr et. al. (1992) stated that urban open spaces must meet five essential needs of individuals: comfort, relaxation, passive engagement with the environment, and active engagement with the environment. The result for this particular segment's questions categorized in the group of passive needs, relaxation needs, comfort needs, and activity needs is presented in the figures.

The results of the mean analysis revealed that all relaxation needs received high mean scores (mean $\geq$ 4) However, passive engagement in total received the highest mean score, which was slightly greater than the mean score of relaxation needs, and this was followed by comfort needs, discovery, and active recreational needs. These results indicated that public space was rated high in terms of meeting passive engagement and relaxation needs. In other words, public space in Kuala Lumpur city center was able to provide an enjoyable place for passive activities. The result mean scores also emphasized the importance of "openness" as well as the "presence of a lot of people in the public space" which ensured a feeling of safety. A public space that successfully meets users' activity needs results in an increase in usage. These should ensure the public space's success.

However, the results of frequency and mean analysis of users' active engagement needs revealed that the public space did not successfully meet users' active needs as compared to other needs. Thus, it can be claimed that public space in the city center is a good place for relaxation and passive activities resulting in psychological benefits, but the space was not successful in providing users with social and physical activity benefits.

Besides, the space does not adequately provide opportunities to do different activities as well as group activities or to hold club meetings, thus the public space could not strongly meet users' social and physical activity needs. Nonetheless, one needs to refer to the objectives of the existing public space. The main focus of the current public space was to provide to larger open space and forget the hustle and bustle of the city. This is to satisfy the passive and relaxation needs and bring psychological benefits. Therefore, it can be concluded that public space in the city center was successful in achieving its objectives This further justifies that the public space currently does very less in promoting interaction and social integration due to the fact that in segment C, it was concluded that public spaces are currently only successful in satisfying the passive and relaxation needs and bringing psychological benefits.

The next segment of the survey, it shows that the outcome justifies the users of public space do not hold any prejudice toward any other users that will be sharing the space with them. in the research on public space in Kuala Lumpur city center to promote social integration and social interaction, there was an examination conducted through a survey to assess the attitudes of users towards other users from different backgrounds.

In this particular segment of the survey, the research findings suggest that the users of public spaces

in the city center of Kuala Lumpur do not hold any kind of prejudice or negative attitudes towards other users who may come from different nationalities, income levels, or religious backgrounds. This indicates that the users of public spaces in the city center of Kuala Lumpur are open-minded and inclusive, and welcoming of people from diverse backgrounds.

This finding is significant in the context of promoting social integration and interaction because it suggests that users of public spaces in the city center of Kuala Lumpur are willing to engage with people from different backgrounds, and are able to create a sense of communal identity that is inclusive of everyone who uses the public spaces.

Overall, this segment of the survey provides insights into the positive attitudes of users of public spaces in Kuala Lumpur city center, suggesting that the people who use these spaces are well-suited for promoting social integration and social interaction in the city center.

Hence, it can be concluded that active engagement is the key factor in providing a common ground for the users of public space in the city center and formulating a sense of attachment toward to short-term relationships created by active engagement activities to promote interaction within different urban dwellers in the city center and create a social integration community with the new public space design framework. The findings suggest that by actively engaging and participating in public space activities, people from diverse backgrounds can form a common ground and create a sense of attachment to one another. These short-term relationships created by active engagement activities can promote interaction and social integration between different urban dwellers in the city center, ultimately leading to the creation of a social integration community with the new public space design framework.

This implies that public spaces in the city center of Kuala Lumpur need to be designed with a focus on creating opportunities for active engagement and participation, such as community events, outdoor sports, and cultural activities. By fostering an environment that encourages active engagement and participation, public spaces can become a hub for social integration and interaction between diverse groups of people.

In conclusion, the research findings suggest that the creation of a social integration community in the city center of Kuala Lumpur requires a focus on design that facilitates active engagement and participation in public spaces. Creating short-term relationships through active engagement activities encourages people from different backgrounds to interact and form a sense of attachment to one another, ultimately leading to the formation of a social integration community.

CONCLUSION

In conclusion, the survey results indicate that the majority of the respondents are keen to have a more interactive public space that allow them to interact with other. This shall be build on strong foundation where the public space must first be in good quality and in sufficient quantity in term of design and program planned within the public space. The survey results of current public space was high in term of meeting passive engagement and relaxation needs, and able to provide an enjoyable place for passive activities. However, the results of frequency and mean analysis of users' active engagement needs revealed that the public space did not successfully meet users' active needs as compared to other needs. Thus, it can be claimed that public space in the city center is a good place for relaxation and passive activities resulting in psychological benefits, but the space was not successful in providing users with social and physical activity benefits.

Besides, the space does not adequately provide opportunities to do different activities as well as group activities or to hold club meetings, thus the public space could not strongly meet users' social and physical activity needs. Nonetheless, one needs to refer to the objectives of the existing public space. The main focus of the current public space was to provide to larger open space and forget the hustle and bustle of the city. This is to satisfy the passive and relaxation needs and bring psychological benefits. Therefore, it can be concluded that public space in the city center was successful in achieving its objectives. This further justifies that the public space currently does very less in promoting interaction and social integration due to the fact that in segment C of the

survey, it was concluded that public spaces are currently only successful in satisfying the passive and relaxation needs and bringing psychological benefits.

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ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my advisor, Professor Ts. Dr. Mohd for his unwavering support and guidance throughout my dissertation journey. Their passion for research and their commitment to my success inspired me to push beyond my limits and achieve new heights. I would also like to thank my family and friends for their unyielding encouragement and love, which provided me with the strength and motivation to accomplish my goals. Finally, I extend my sincere appreciation to all the participants who generously gave their time and shared their insights, without whom this research would not have been possible

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CULTURAL HERITAGE ARCHITECTURE

EMPOWERING BAJAU LAUT COMMUNITIES THROUGH INNOVATIVE SPACE DESIGN OF ART AND CRAFT HUBS TOWARDS SUSTAINABLE LIVELIHOODS

Alaa Hecham Senjab, Nor Azlina Abu Bakar ,

ABSTRACT

The Bajau Laut community in Sabah, Malaysia, exhibits a diverse range of eco-cultural practices, livelihood strategies, and artistic expressions. As a result of the establishment of marine boundaries, the individuals in question were compelled to relinquish their houseboat and customary artistic and artisanal practices. Although the Bajau Laut's cultural practices have been leveraged to boost tourism, their traditional artisanal skills have had a restricted influence on the expansion of the tourism industry. Moreover, there exists a dearth of approaches aimed at augmenting the proficiencies of the Bajau Laut populace. The present study endeavours to formulate novel spatial design tactics for customary arts and crafts centres of Bajau Laut, with the aim of enhancing communal welfare and advancing sustainable livelihoods. The study will employ qualitative methodologies, such as conducting in-depth interviews and conducting a secondary data review, to examine the experiences and viewpoints of the Bajau Laut community. The afore mentioned techniques will offer valuable perspectives on the obstacles, prospects, and design factors involved in establishing environments that facilitate the traditional artistic and artisanal pursuits of the Bajau Laut community. This study aims to create novel spatial design approaches that enable the Bajau Laut population to improve their customary artistic and handicraft traditions, promote their general welfare, and foster sustainable growth. Consequently, the outcome of this study will make a valuable contribution towards formulating all-encompassing spatial planning approaches for customary arts and crafts centres within the Bajau Laut society, augmenting communal welfare and fostering sustainable means of subsistence.

Keywords: Bajau Laut; arts and crafts; sustainable livelihoods; community well-being; innovation

1 INTRODUCTION

1.1 Background of study

The community of Bajau Laut in Sabah, Malaysia, serves as a moving portrayal of enduring statelessness and its adverse impact on the attainment of essential human rights. The lack of employment prospects, access to medical services, educational opportunities, and mobility options poses considerable difficulties for the stateless Bajau Laut community, frequently leading to a protracted period of hardship and impediments. As a result, the cultural practises, customs, artistic expressions, and craftsmanship that were once intricately linked to the Bajau Laut's sense of self have receded into the realm of distant recollection (Wan Hassan & Peters, 2020). Siow (2014) has observed that although the Bajau Laut culture has been leveraged to boost tourism on Sabah's eastern coast, the primary beneficiaries of this industry are the tourism entrepreneurs, while the Bajau Laut community has minimal impact on the expansion of tourism.

Notwithstanding their vulnerable condition, the Bajau Laut community exhibits a remarkably affluent eco-culture, means of subsistence, and artistic creativity. The Bajau Laut community has inherited and transmitted traditional crafts, including Tepo (mat weaving), Lapohan (clay stove), Ukiran Sunduk (timber grave marker), and Lepa (boathouse construction), across multiple generations. The direct correlation between handicrafts and two of the Sustainable Development Goals (SDGs) highlights the importance of handicrafts in the context of sustainable development. Initially, it can be posited that handicrafts make a noteworthy contribution to the attainment of

Sustainable Development Goal 5, which is centred on promoting gender equality and empowering women. The practise of creating handicrafts has been observed to have a positive impact on the economic and social empowerment of women within their respective communities. Furthermore, it can be argued that handicrafts are in alignment with Sustainable Development Goal 8, which advocates for the advancement of sustained, inclusive, and sustainable economic growth, as well as the provision of full and productive employment and decent work opportunities for all. The act of participating in handicraft production can serve as a means for communities to make a valuable contribution towards the attainment of a particular objective. In addition, it is noteworthy that culture assumes a crucial function in the attainment of SDG 11, which centres on the guarantee of all-inclusive, secure, durable, and sustainable urban areas and human habitats (The 17 Goals | Sustainable Development, n.d.).

Hence, it is crucial to tackle the obstacles encountered by the Bajau Laut populace via inventive spatial arrangement, with a particular emphasis on conventional art and craft centres. be sustained, and their cultural heritage can be preserved for future generations. The promotion of thriving conditions can result in the establishment of sustainable livelihoods and the preservation of cultural heritage. The objective of this study is to investigate the potential of innovative spatial design in enabling the Bajau Laut community to enhance their traditional art and craft practises, promote their well-being, and facilitate sustainable development.

1.2 Motivational Problems

With the advent of modernization, the lifestyle of the Bajau Laut community underwent significant transformation. As a result of the establishment of marine boundaries, individuals were compelled to relinquish their houseboat and customary artistic and craft practises and adapt to a refined contemporary way of life, which has presented challenges in its attainment (Wan Hassan & Peters, 2020). Madlan et al. (2014) have observed that the presence of bias among the stateless population has had an impact on their socioeconomic standing and their interactions with neighbouring communities.

Nonetheless, no discernible tactics or recommendations have been identified to enhance and fortify the proficiencies of the Bajau Laut Community and their socioeconomic standing. Moreover, there exist deficiencies in the effective execution and management of Semporna's policy on rural tourism. Hence, a discrepancy exists in the involvement of the local community in activities pertaining to tourism. Furthermore, it has been observed that in Malaysia, indigenous communities such as the Bajau Laut are excluded from the decision-making process pertaining to tourism management and do not receive any advantages from tourism-related undertakings. As a result of lacking proper documentation, these individuals will be ineligible for government aid, exacerbating their financial struggles and leaving them reliant on non-governmental organisations that have been advocating for community registration.

1.3 Research problems

According to recent research conducted by Wan Hassan and Peters (2020), the statelessness of the Bajau Laut community has rendered them susceptible to security issues. Additionally, Acciaioli et al. (2017) have noted a dearth of conservation efforts and social services available to this community. Furthermore, scholarly research indicates that the Bajau Laut community participates in harmful, low-tech fishing practises, such as utilising fish bombs (Syarifuddin & Sukimi, 2022). This is due to the fact that marine resources serve as a primary means of subsistence for this group (Clifton & Majors, 2011), and they possess inadequate understanding of the ecological consequences of these activities (Syarifuddin, 2020; Syarifuddin et al., 2018). The Bajau Laut community has not been extensively studied, particularly with regard to their way of life, challenges, and supplementary means of income, such as handicrafts. These handicrafts can serve as a sustainable alternative livelihood and contribute to the preservation of the Bajau Laut's distinct cultural identity.

The objective of this study is to develop strategies that can enhance the welfare of the Bajau Laut community through the utilisation of craft and art practises. Specifically, the study focuses on the establishment of traditional arts and crafts centres that can augment and maintain the livelihood of the said community. Consequently, the aforementioned action is expected to

enhance the recognition of the Bajau Laut community in Malaysia, facilitate their assimilation into the neighbouring community, and foster a constructive impact towards the empowerment of their female members.

2 LITERATURE REVIEW

2.1 Historical background and cultural significance of traditional arts and crafts in Bajau Laut communities.

The Bajau Laut communities have a rich historical background and cultural heritage deeply rooted in their traditional arts and crafts. These communities, also known as “sea nomads,” have a longstanding tradition of craftsmanship that has been passed down through generations (Kusuma et al., 2017). The Bajau Laut people have a close connection to the sea, and their arts and crafts reflect their intimate relationship with the marine environment.

Traditional arts and crafts hold immense cultural significance for the Bajau Laut communities. These artistic practices serve as a means of cultural expression, storytelling, and preserving their unique identity (Panaguiton, 2011). The craftsmanship involved in creating traditional artifacts, such as boat-building, weaving, and metalwork, showcases their exceptional skills and expertise (Panaguiton, 2011).

2.2 Current Status and Challenges of Traditional Arts and Crafts Practices in Bajau Laut Communities

Despite the cultural significance of traditional arts and crafts, the Bajau Laut communities face various challenges in maintaining and continuing these practices. The rapid modernization and changing socioeconomic dynamics pose threats to the preservation of traditional craftsmanship (Syarifuddin, 2018). The younger generations are increasingly drawn to alternative livelihood opportunities and are less inclined to pursue traditional arts and crafts (Syarifuddin, 2018). Moreover, the Bajau Laut communities encounter external challenges such as limited access to resources, market opportunities, and infrastructure support (Wan Hassan & Peters, 2020). The absence of recognition and protection of their cultural heritage exacerbates the difficulties faced by the artisans in sustaining their traditional practices (Wan Hassan & Peters, 2020). These challenges, coupled with environmental changes and socio-political factors, contribute to the gradual decline of traditional arts and crafts within the Bajau Laut communities.

2.3 Relationship between Traditional Arts and Crafts and Sustainable Livelihoods in Bajau Laut Communities

Traditional arts and crafts have a significant relationship with sustainable livelihoods in the Bajau Laut communities. The practice of these crafts provides a source of income and economic opportunities for the artisans, contributing to their livelihoods (Panaguiton, 2011). The sale and trade of traditional handicrafts can generate revenue, especially through cultural tourism, thereby supporting the economic well-being of the communities (Panaguiton, 2011). Furthermore, traditional arts and crafts have the potential to promote sustainable practices and environmental conservation within the Bajau Laut communities. Many of these crafts are made using locally sourced and eco-friendly materials, aligning with principles of sustainability (Panaguiton, 2011). By encouraging the continuation of traditional craftsmanship, communities can preserve their cultural heritage while promoting sustainable practices that protect the marine ecosystem and natural resources they depend on (Abu Bakar, 2019).

The relationship between traditional arts and crafts and sustainable livelihoods extends beyond economic and environmental aspects. Engaging in these creative practices fosters a sense of cultural pride, identity, and social cohesion within the Bajau Laut communities (Panaguiton, 2011). It provides a platform for intergenerational knowledge transfer and community bonding, ensuring the preservation and transmission of cultural traditions for future generations. Overall, understanding the historical background, cultural significance, current challenges, and the relationship between traditional arts and crafts and sustainable livelihoods is crucial in formulating strategies and interventions to support and revitalize these practices within the Bajau Laut communities.

2.4 Concepts Related to Space Design for Sustainable Livelihoods

In the context of the Bajau Laut communities, space design plays a crucial role in promoting sustainable livelihoods and community development. The concept of space design encompasses the physical planning and organization of living and working spaces to create environments that support sustainable practices and enhance the well-being of community members (Fries-Briggs, 2022). The design of spaces in Bajau Laut communities should take into consideration various factors, including the socio-economic, cultural, and environmental aspects, to foster sustainable and resilient development (Fries-Briggs, 2022). It is essential to create inclusive spaces that cater to the specific needs and aspirations of the community, while also promoting sustainability.

One important concept related to space design for sustainable livelihoods is the idea of community engagement and participation in the design process. By involving community members in decision-making and planning, their unique perspectives and knowledge can be incorporated into the design outcomes. This participatory approach not only ensures that the design aligns with the community's needs but also fosters a sense of ownership and attachment among community members (Fries-Briggs, 2022). Additionally, the integration of traditional and modern architectural elements in space design is crucial for preserving cultural heritage while meeting contemporary requirements. By incorporating traditional materials, construction techniques, and design aesthetics, the spaces reflect the cultural identity of the Bajau Laut communities and contribute to the preservation of their rich heritage (Fries-Briggs, 2022).

Moreover, space design for sustainable livelihoods should prioritize environmental sustainability. This can be achieved through the incorporation of passive design strategies, such as maximizing natural ventilation and daylight, as well as integrating renewable energy sources for energy efficiency. Water and waste management systems should also be considered to minimize environmental impact and promote sustainable practices (Fries-Briggs, 2022).

2.5 Designing Sustainable Handicraft Practices for Underprivileged Communities: Enhancing Livelihoods and Promoting Sustainability

The design of sustainable handicraft practices is a vital aspect of promoting livelihoods and sustainability within underprivileged communities, including the Bajau Laut. Handicrafts offer a unique avenue for economic empowerment and cultural preservation, while also contributing to sustainable development.

Designing sustainable handicraft practices involves various considerations. First, it is crucial to identify locally available resources and materials that can be used for handicraft production. By utilizing indigenous materials, the environmental impact can be minimized, and the cultural heritage of the community can be celebrated (Kamiruddin et al., 2017). Furthermore, sustainable handicraft practices should prioritize ethical production methods. This includes promoting fair trade principles, ensuring safe working conditions, and providing fair wages for artisans. By supporting the rights and well-being of the artisans, sustainable handicraft practices contribute to social and economic justice within the community (Kamiruddin et al., 2017).

Additionally, sustainable design principles should be incorporated into the production process. This includes using eco-friendly techniques and materials, minimizing waste, and exploring innovative approaches such as upcycling or recycling materials. By embracing sustainable design, handicraft practices can reduce their ecological footprint and contribute to the overall sustainability of the community (Huang & Anderson, 2019). Furthermore, the marketing and promotion of sustainable handicrafts are crucial for enhancing livelihoods. By creating market linkages, developing branding strategies, and exploring new market opportunities, artisans can access wider customer bases and increase their income. This, in turn, contributes to the economic well-being of the community (Kamiruddin et al., 2017).

In conclusion, designing sustainable handicraft practices for underprivileged communities, such as the Bajau Laut, plays a significant role in enhancing livelihoods and promoting sustainability. By considering factors such as local resources, ethical production methods, sustainable design principles, and effective marketing strategies, these practices can contribute to economic empowerment, cultural preservation, and environmental sustainability within the community.

2.6 Empowerment and Community Development of Bajau Laut Communities

Empowerment and community development are crucial aspects of promoting sustainable livelihoods within the Bajau Laut communities. Empowerment refers to the process of enhancing individuals' capabilities, agency, and decision-making power, enabling them to actively participate in shaping their lives and communities (Serrat, 2017). Community development, on the other hand, involves fostering social, economic, and environmental improvements within a community (Korten, 1996). In the context of the Bajau Laut, empowerment and community development initiatives aim to address various challenges and inequalities faced by the community. These challenges can include limited access to education, healthcare, economic opportunities, and social services. By empowering individuals and communities, they can overcome these challenges and work towards sustainable livelihoods (Serrat, 2017).

Empowerment and community development programs often involve capacity building, where individuals are provided with knowledge, skills, and resources to enhance their economic prospects and overall well-being. This can include vocational training, entrepreneurship support, financial literacy programs, and access to credit and market opportunities (Serrat, 2017). By equipping community members with the necessary skills and resources, they can engage in income-generating activities and improve their livelihoods. Furthermore, community participation and engagement are vital for sustainable empowerment and development. It is essential to involve community members in decision-making processes, project planning, and implementation. This participatory approach ensures that initiatives align with the community's needs, values, and aspirations, leading to more sustainable outcomes (Serrat, 2017).

2.7 The Contribution of Handicraft as an Alternative towards Sustainable Livelihood

Handicraft production offers a significant opportunity for the Bajau Laut communities to achieve sustainable livelihoods, economic empowerment, and community development. Handicrafts represent a form of cultural expression and creativity deeply rooted in the community's heritage and traditions. By leveraging these skills and cultural assets, handicrafts can become a sustainable source of income for community members.

The research articles by Kamiruddin et al. (2017), Huang and Anderson (2019), and Lestari et al. (2020) provide valuable insights into the contribution of handicrafts towards sustainable livelihoods. These studies highlight the close ties between sustainability and traditional crafts, emphasizing the environmental, cultural, and economic considerations involved. Firstly, handicraft production offers employment prospects and income generation opportunities within the craft industries (Kamiruddin et al., 2017). Additionally, the use of biodegradable materials, sustainable harvesting practices, upcycling, and other environmentally conscious approaches are integral to traditional arts and crafts (Huang and Anderson, 2019). Moreover, handicrafts play a crucial role in preserving traditional crafting skills, cultural heritage, and knowledge transfer across generations (Huang and Anderson, 2019). These factors contribute to economic growth and income production, thus improving sustainable livelihoods (Huang and Anderson, 2019).

Furthermore, the significance of handicrafts extends beyond economic benefits. They also help in preserving cultural heritage, strengthening product connections, and fostering a sense of ownership within local communities (Huang and Anderson, 2019). In particular, handicrafts made from specific materials, such as Purun plants, have the potential to support sustainable livelihoods and contribute to the restoration and conservation of ecosystems (Lestari et al., 2020).

Additionally, recognizing the contribution of handicrafts to the national economy, particularly in rural areas, is crucial for sustainable development (Oluwayemisi, 2020). From a design perspective, sustainability plays a strategic role in resolving cultural identity crises and revitalizing the culture and economy of local communities (Wenjia et al., 2022). By incorporating sustainable practices, such as using environmentally friendly materials and promoting social and environmental sustainability, handicrafts can enhance their role in fostering sustainable livelihoods (Wenjia et al., 2022). Furthermore, handicrafts have the potential to enhance tourism development in the Bajau Laut communities. Handicraft products, with their unique designs and cultural significance,

can attract tourists seeking authentic and locally made souvenirs. This creates opportunities for community-based tourism initiatives, where visitors can engage with artisans, learn about traditional craft practices, and support the local economy (Halewood, 2015).

In conclusion, sustainable livelihoods play a vital role in empowering the Bajau Laut communities and promoting their overall development. By focusing on empowerment and community engagement, individuals can actively participate in shaping their lives and communities. Handicraft production, with its economic, cultural, and tourism potential, offers a viable pathway towards sustainable livelihoods and community development. By investing in handicraft production and providing necessary support, the Bajau Laut communities can leverage their unique cultural heritage to improve their livelihoods and achieve sustainable and inclusive growth.

3 METHOD

The research methodology focuses on adopting a qualitative research approach to gain in-depth insights into the challenges and opportunities faced by the Bajau Laut community in relation to their traditional art and craft practices, as well as exploring the potential of innovative space design in empowering the community and enhancing their sustainability and livelihoods.

Omadal Island was chosen as the study site due to its significant Bajau Laut population and the preservation of their cultural heritage despite socio-economic challenges. By focusing on Omadal Island, this research aimed to gain insights into the specific dynamics, cultural traditions, and socio-economic conditions influencing the Bajau Laut community's traditional art and craft practices.

To ensure a diverse range of perspectives within the Bajau community, a purposive sampling strategy was employed. The selection process aimed to include participants from both the stateless Bajau Laut community and the Bajau Tempatan Malaysian community residing on Omadal Island. Furthermore, the involvement of Bajau Laut children was prioritized by organizing a workshop that allowed their unique viewpoints and ideas regarding innovative space design to be captured and considered. This participatory approach enhanced the inclusivity and participatory nature of the research.

3.1 Data Collection

The data collection process consisted of various methods to address the research questions:

For Research Question 1, which focuses on understanding the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices, the following data collection methods were employed:

- i. Semi-structured interviews with the local community: These interviews provided valuable insights into the experiences, perspectives, and obstacles encountered by the community in relation to their traditional arts and crafts practices.
- ii. In-depth interviews with DHRRA MALAYSIA: Expert insights and recommendations were gathered through in-depth interviews with this prominent organization, further enriching the understanding of the challenges faced by the Bajau Laut community.
- iii. Observation: Direct engagement with the community through observation allowed for a deeper understanding of their culture, practices, and challenges. This involved actively engaging with the local community by conducting semi-structured interviews to gain valuable insights into their perspectives, experiences, and the challenges they face related to the research topic. This direct interaction enabled the researcher to develop a deep understanding of their culture, practices, and challenges as both a participant and a researcher.

For Research Question 2, which explores how innovative space design can enhance the sustainability and livelihoods of the Bajau Laut community, the following data collection methods were utilized:

- i. Participatory methods: Focus group sessions were conducted to provide an opportunity for Bajau Laut children to actively contribute their views and ideas on innovative space design.

Through various activities such as drawing, group discussions, and narratives, the unique perspectives and creativity of the children were captured, informing the formulation of design strategies.

3.2 Qualitative Data Analysis Techniques

The qualitative data obtained through interviews, workshops, and observations were analyzed using thematic analysis, content analysis, and comparative analysis techniques. Thematic analysis involved identifying recurring themes and patterns within the data, providing insights into the challenges faced by the Bajau Laut community, and informing the design strategies for the proposed innovative space. Content analysis focused on systematically reviewing and categorizing data from workshops with Bajau Laut children, capturing their unique perspectives and ideas. Comparative analysis involved examining existing case studies of art and craft hub spaces to identify best practices, challenges, and opportunities specific to the Bajau Laut community.

3.3 Ethical Considerations

Ethical considerations were prioritized throughout the research process, particularly during the workshop with the Bajau children and the interviews with the Bajau women. Informed consent was obtained from all participants, and their privacy and confidentiality were respected. Language barriers were addressed by working closely with a local community member proficient in English and Bajau, ensuring accurate understanding and meaningful conversations. These ethical measures aimed to uphold the rights, well-being, and cultural sensitivity of the Bajau children and women involved in the research.

3.4 Chapter Summary

This chapter presented the research methodology employed in the study, including the research approach, fieldwork and sampling strategy, data collection methods, qualitative data analysis techniques, and ethical considerations. The qualitative research approach allowed for a comprehensive exploration of the research topic, capturing the perspectives, experiences, and needs of the Bajau Laut community. By employing various data collection methods and analysis techniques, the study aimed to enhance the validity and reliability of the findings. The chapter concluded with an overview of the research methodology employed in this study.

4 RESULT

This chapter presents the results of the research study, focusing on the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices and the potential of innovative space design in enhancing their sustainability and livelihoods. The findings are based on interviews, observations, and a workshop with children from the Bajau Laut community.

4.1 Challenges Faced by the Bajau Laut Community

The interviews conducted with weavers from the Bajau Laut and Bajau Tempatan communities revealed several challenges related to the preservation of traditional art and craft practices. Financial instability emerged as a significant concern, as many weavers struggled to earn a sufficient income from their craftwork. Limited access to clean water and healthcare services posed additional challenges, affecting the overall well-being of the community.

“The problem face by the community are lack of income and health.” (R03)

Moreover, passing down traditional crafts to younger generations proved to be difficult due to changing lifestyles and reduced interest among the youth. The growing population and environmental pollution further compounded the challenges faced by the community. These findings indicate the need for targeted support and interventions to address these multifaceted challenges.

“The issue with practicing a craft like weaving or making clay pots, or any other craft, today is lack of inheriting crafts “ (R01)

“Making handicrafts such as mats, jewelry, or any other craft is hard work, a long process. There is no suitable place to weave.” (R01)

“Weaving is a long process, and it’s hard work.” (R02)

“ it doesn’t take a day to complete a mat the process is long.” (R04)

The weavers expressed a strong desire for support from government agencies and NGOs to address these challenges. They emphasized the importance of income generation programs tailored to their traditional art and craft practices, which would provide economic stability and opportunities for the community.

“We believe in adding goodness to our community, and we appreciate the support we receive.” (R02)

“Before the establishment of WAPO Weaving craft organization, I struggled to support my family. But now, I can make a living out of my craft skills.” (R04)

Furthermore, improving access to clean water and healthcare services emerged as crucial priorities for enhancing the overall quality of life. The weavers also stressed the need for skill development initiatives that focus on preserving and refining their traditional craftsmanship. Additionally, infrastructure enhancement, such as the provision of dedicated spaces for weaving activities and storage, was deemed essential for promoting the sustainability of their practices.

“We need relevant courses in sewing, cooking, and learning to read the Quran.” (R04)

4.2 Innovative Space Design and Its Role in Enhancing Sustainability and Livelihoods

The observations of the weaving process and facilities at Omdal Island highlighted the significance of innovative space design in improving the sustainability and livelihoods of the Bajau Laut weaving community. Optimal workspaces for Tepo Mat production were identified as a critical element for enhancing productivity and craftsmanship. These spaces should offer ample room for weaving activities, proper ventilation, and individual workstations, thereby facilitating the weavers’ creativity and efficiency.

In addition to production spaces, the study emphasized the importance of exhibition and market access spaces. Improved market visibility would enable the community to showcase their diverse range of weaving products to a broader audience. Creating dedicated spaces for cultural celebrations and events would further enhance market opportunities and promote socio-economic development within the community.

“In my opinion, exhibiting mat making to others is highly valuable as it provides an opportunity for cultural exchange. Through these exhibitions, people can share and learn from each other’s cultures, fostering mutual understanding and appreciation.” (R01)

Furthermore, the establishment of a common sewing workshop emerged as a vital aspect of innovative space design. This shared facility would provide access to sewing machines and necessary equipment, encouraging collaboration and skill-sharing among the weavers. Ensuring reliable power supply to the workshop through sustainable energy sources would facilitate flexible sewing activities and support the weavers’ entrepreneurial endeavors.

4.3 Workshop with Children and Their Perspectives

The workshop with children from the Bajau Laut community provided valuable insights into their perspectives, needs, and aspirations. The children expressed a strong desire for improved housing conditions, including larger homes and better sleeping arrangements. They emphasized the importance of spacious and comfortable living environments that reflect their cultural identity. Integrating elements of nature into their living spaces, such as gardens or green areas, was seen as crucial to maintaining their connection with the environment and promoting a sense of well-being.

- 1 Tepat Tidur (Bed-room)
- 2 Tempat Makan
- 3 Boat
- 4 Kolam (Fish pond)
- 5 Tudung (Shading)
- 6 Lampu



Figure 4.1: Model A showing Spacious family bedroom design.
(Source: Author, 2023)



Figure 4.2: Model K showing Better Sleeping Arrangements
(Source: Author, 2023)

The children also highlighted the significance of communal gathering areas and recreational spaces. They expressed a need for outdoor spaces where families and community members can come together, socialize, and engage in various activities. Shaded areas were deemed important, particularly in the tropical climate, to provide relief from the sun and create comfortable environments for social interactions.



Figure 4.3: 2D Drawing showing family members happily outside the house.
(Source: Author, 2023)

Furthermore, the workshop showcased the children's environmental consciousness and their understanding of sustainable living practices. They expressed concerns about environmental issues such as limited access to clean water and showcased innovative solutions in their designs. This highlights the importance of incorporating sustainable design principles into innovative space designs to address the environmental challenges faced by the community.



Figure 4.4: 2D Drawings showing rainwater harvesting tank.
(Source: Author, 2023)

In conclusion, the results chapter has presented the findings of the research study, highlighting the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices. The chapter has also emphasized the role of innovative space design in enhancing their sustainability and livelihoods. The findings emphasize the need for targeted interventions and support, including income generation programs, improved access to healthcare and clean water, skill development initiatives, and infrastructure enhancement. The perspectives of children further underscore the importance of cultural preservation, comfortable living environments, communal spaces, and sustainable practices in designing spaces that meet the needs and aspirations of the Bajau Laut community.

5 DISCUSSION

This chapter provides a comprehensive discussion of the results obtained from the research study on the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices and the potential of innovative space design in enhancing their sustainability and livelihoods. The discussion aims to analyze the implications of the findings, identify key themes, and provide recommendations for future interventions and initiatives.

5.1 Implications of the Findings

The findings of this study have significant implications for addressing the challenges faced by the Bajau Laut community and promoting the sustainability of their traditional art and craft practices. The challenges identified, such as financial instability, limited access to clean water and healthcare, and difficulties in passing down traditional crafts, require targeted interventions and support. The insights gained from the interviews, observations, and workshop highlight the importance of income generation programs tailored to the community's traditional art and craft practices. Such programs can provide economic stability, encourage entrepreneurship, and preserve cultural heritage.

Improving access to clean water and healthcare services emerged as critical priorities for enhancing the overall well-being and quality of life for the community. Collaboration between government agencies, NGOs, and the Bajau Laut community is essential to develop initiatives that address these challenges effectively. Additionally, skill development programs can play a vital role in preserving and refining traditional craftsmanship, ensuring the transmission of these skills to younger generations and securing the cultural heritage of the community.

Innovative space design, as identified in the study, offers opportunities for enhancing the sustainability and livelihoods of the Bajau Laut community. Optimal workspaces for production, exhibition and market access spaces, and a common sewing workshop can significantly contribute to the productivity, market visibility, and collaboration among the weavers. The provision of communal gathering areas and recreational spaces promotes social interaction, community cohesion, and a sense of belonging.

5.2 Recommendations for Future Interventions

Based on the findings, several recommendations can be made for future interventions aimed at empowering the Bajau Laut community and preserving their cultural heritage. These recommendations include:

Developing and implementing income generation programs tailored to the community's traditional art and craft practices, with a focus on entrepreneurship, market access, and product diversification.

Collaborating with government agencies and NGOs to improve access to clean water and healthcare services, considering the unique challenges faced by the community.

Facilitating skill development programs that combine traditional craftsmanship with modern techniques, ensuring the transmission of knowledge and skill to younger generations.

Designing and establishing innovative spaces that optimize the weaving process, provide exhibition, and market access, and offer sewing facilities, promoting collaboration, productivity, and market visibility.

Creating communal gathering areas and recreational spaces that foster social interaction, community cohesion, and cultural celebrations, considering the preferences and needs of the community.

Incorporating sustainable design principles and environmental considerations into innovative space designs, addressing challenges such as limited access to clean water and promoting sustainable living practices within the community.

The discussion chapter has provided an in-depth analysis of the results obtained from the research study, focusing on the challenges faced by the Bajau Laut community and the potential of innovative space design in enhancing their sustainability and livelihoods. The implications of the findings have been discussed, emphasizing the need for targeted interventions, collaboration, and support from government agencies and NGOs. The recommendations provided offer practical guidance for future interventions, ensuring the preservation of cultural heritage, economic sustainability, and community well-being. By addressing the challenges identified and implementing innovative space designs, the Bajau Laut community can thrive and secure a prosperous future for generations to come.

CONCLUSION

The research study aimed to explore the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices and investigate the role of innovative space design in improving their sustainability and livelihoods. Through a mixed-methods approach involving interviews, observations, and workshops, valuable insights were gathered to inform the design of innovative spaces that support the community's traditional practices. The findings of this study have several implications and provide important recommendations for future research.

The research revealed the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices. These challenges include financial instability, limited access to resources, difficulty in inheriting traditional crafts, and environmental changes. Moreover, the labor-intensive nature of their craft-making process and the need for suitable weaving spaces were identified as significant factors affecting the community.

In terms of the analysis of the weaving process and facilities, it was evident that innovative space design plays a crucial role in enhancing the sustainability and livelihoods of the Bajau Laut weaving community. Optimal workspaces for production, exhibition spaces, and a common

sewing workshop were identified as crucial elements for supporting the weaving practices and cultural preservation. By implementing these spaces, the community can improve their weaving practices, showcase their products, and enhance their livelihoods.

Furthermore, the workshop with children provided valuable insights into their perspectives and aspirations. The children expressed their desires for improved housing, access to healthcare, preservation of cultural identity, and the integration of nature in their living spaces. Additionally, they emphasized the importance of communal spaces and sustainable living practices. The active involvement of children in the design process empowered them as stakeholders and contributed to the formulation of design strategies that address their specific needs.

While this study has shed light on the challenges and opportunities for the Bajau Laut community, it is important to acknowledge the limitations. The research was conducted in a specific geographical area and involved a limited number of participants. Therefore, the findings may not be generalized to other Bajau Laut communities or cultural contexts. Additionally, the study focused primarily on weaving practices, and other traditional art and craft forms within the community were not extensively explored.

To further advance the understanding of sustainable development within the Bajau Laut community and similar contexts, future research should consider broader geographical areas and larger sample sizes. Moreover, exploring additional traditional art and craft forms and their relationship to innovative space design would contribute to a more comprehensive understanding. Longitudinal studies tracking the impact of implemented design interventions on the community's sustainability and livelihoods would also provide valuable insights.

In conclusion, this research study has shed light on the challenges faced by the Bajau Laut community in preserving their traditional art and craft practices and the potential of innovative space design in improving their sustainability and livelihoods. The findings highlight the importance of targeted support and interventions to address these challenges. Therefore, future research and interventions should consider the unique perspectives and aspirations of the community, ultimately contributing to the long-term vitality of the Bajau Laut community and similar cultural communities.

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IMPLEMENTATION OF NEO-NUSANTARA IN URBANISM: THE CASE OF KOTA BHARU

Wan Mohamad Farkhan, Nor Azlina Abu Bakar,

ABSTRACT

Since 2005, the urban design of Kota Bharu has shifted from being a cultural city to embracing the concept of an Islamic City as a new city branding strategy. The results of the initiative appear to be falling behind in regard to urban planning. Therefore, there is still a dearth of cultural research on Malaysia. Nevertheless, the local government is still committed to revitalizing the concept of the Islamic City, which has previously overlooked the importance of a regional sense of place that fosters communal values. Furthermore, there is a lack of initiative to regulate the implementation and interpretation of the rebranding concept while preserving its conventional authenticity. Consequently, the present study aims to examine the attributes of Neo-Nusantara Architecture with the objective of assimilating and construing its principles within the framework of the Islamic City concept in the Neo-Nusantara context. A qualitative investigation will be undertaken utilizing a literature review, in-depth interviews, and a case study to identify pertinent issues and potentialities derived from the data collection. The present study aims to provide a comprehensive framework for the effective implementation of the Neo-Nusantara characteristic in Kota Bharu. Subsequent research endeavors could utilize this study as a basis to further examine a city center in a different state.

Keywords: nusantara architecture; sense of place; local identity; urban planning

INTRODUCTION

Since 2005, Kota Bharu has transitioned from being branded as a cultural city to adopting the concept of an Islamic City as its latest branding strategy. The municipal administration is considering the implementation of a rebranding strategy aimed at guiding the urban planning of the city, potentially incorporating elements of Islamic identity. The rebranding concept of MPKB-BRI encompasses the notions of “human with god,” “human with human,” and “human with nature,” with the aim of fostering environmental and communal development. According to the Kota Bharu Local Plan 2035, the city is still progressing towards the development of appropriate urban planning that adheres to the principles of the Islamic City concept.

Based on the observation, the concept of an Islamic City appears to emphasize urban design and aesthetics, communal activities and planning, and architectural design. The concept behind the product involves emulating elements from other Islamic nations. The research aims to investigate the local identity and the application of Nusantara Architecture in Kota Bharu while upholding Islamic values, with the objective of exploring innovative city concepts that do not rely on emulation of other Islamic nations.

The concept of Neo-Nusantara will be redefined to align with the fundamental principles of Nusantara Architecture. This will involve emphasizing the unique significance of Kelantan in urban development, with a particular focus on the city center of Kota Bharu. The aim is to establish this area as a model for other city centers in the East Coast region, thereby setting a new standard for urban planning and design.

Kota Bharu, alongside Kangar in Perlis, remains unrecognized as a “Bandaraya,” constituting two of the primary urban centers in Malaysia without such designation. This observation indicates that the advancement of the Islamic City concept in 2005 has been characterized by a lack of pace and inadequacy. This scenario suggests that Kota Bharu is deficient in urban planning that effectively represents the city’s branding. According to a source cited in *Utusan Malaysia* in the year 2022.

Nevertheless, the local governing body remains committed to revitalizing the concept of the Islamic City, despite its tendency to overlook the importance of a regional sense of place that incorporates the traditions and cultural values of the local community.

According to Harun et al. (2011), the results indicated that Kota Bharu, a city known for its Kelantanese Malay culture, is facing challenges in its pursuit to transform into an Islamic city. This predicament may be attributed to the insufficient cultural investigation conducted by architects and researchers on the Kelantanese culture. There exists a necessity to conduct research on the local identity that imbues a sense of authenticity to the urban landscape, particularly in the context of Kota Bharu.

Notwithstanding, there is a dearth of data and research pertaining to the resolution of the authentic identity of Kota Bharu. Furthermore, there is a lack of initiative towards regulating the implementation and interpretation of the rebranding concept while preserving its conventional authenticity. Kota Bharu is currently grappling with the predicament of transforming its identity into that of an Islamic city, thereby impacting both the urban landscape and the local populace.

The aim of this study is to examine the attributes of Neo-Nusantara Architecture and to apply and construe its principles within the framework of the Islamic City concept in a Neo-Nusantara context.

Objective 1. To identify the authenticity of the local identities in Kota Bharu by examining the perceptions of local residents towards the creation of a sense of place, and the enhancement of the urban structure and community value in the area.

Objective 2. To examine the Neo-Nusantara characteristics that are supported by the local community and provide recommendations for the development of guidelines for Neo-Nusantara design in architecture and urban planning in Kota Bharu.

Local Identity and Sense of Place Implementation in Urban Planning.

Local identity can be defined as a heart spirit of a city that creates a different experience from that of another city. This distinct experience will include the unique atmosphere of a particular area, the people who live there, and their worldview. According to Shao et al. (2017), small-scale locales, such as city quarters or street level, are used to illustrate local identity because they provide characteristics that help form a recognized image of the area and its inhabitants, helping to identify the area from other locations. It offers unique sensations by way of the physical, social, sensory, and memory aspects; such sensations include both pleasant and negative feelings. Local identity also derives starting from National identity which contains the aspect of races, language, and religion. Continuing with Regional identity which explains the context of flexible term, landmark, nature and social and historical process. Followed by the Urban identity that contains urban pattern and context, social interaction and historical content. Urban context, social interaction and historical content will create the direction to the local identity which includes the aspect of physical, social, historical and aesthetic value.

In the case of Kota Bharu, the bonding between the local identity value with the city branding development is far beyond the main agenda which create less attraction to the visitors and locals at the same time sparks the conflict between the cultural and new city branding identity of Kota Bharu which is to become an Islamic city. Adib (2021) mention that conflict over cultural and Islamic identities has made tourists less interested in visiting Kelantan tourism sites for longer, and the physical characteristics of Kota Bharu have become less authentic, which has reduced the number of tourists who return there.

Place identity and place attachment mainly include with the connection from the physical and nature aspects. According to Shao et al. (2017), quality of urban life can be improved through the integration of environmental, economic, and social factors when a sense of place is fostered. Natural surrounding element is one of the major points towards the sense of place and local identity unique value for a specific city. The natural element naturally gives a spiritual connection to the local community. Shamsuddin (2008) mention that the importance of the natural surroundings and human activities in establishing a sense of place has received considerable attention in research on urban design and place quality. It also suits with the agenda and ideology of Kota Bharu local authority to implement the idea of 'human and nature' in their manifestation of city branding. The nature quality and preservation are the needed for Kota Bharu in order to increase and comply with the standard. According to Najafi (2011), in order to preserve both the integrity of human existence within the environment and its quality, sense of place must be created or preserved. The existing natural and physical features should be preserved in order to avoid feeling of place being lost and damaged the location's historical merits. On the other hand, it refers to the connection that exists between individuals and a trove of memories, interpretations, ideas, and associated emotions regarding different sorts of locations as well as the actual settings themselves. Radstrom (2011) mention that, when cities do make changes, they should do so with the intention of enhancing the quality of life for their citizens, enhancing the region's environmental sustainability, and never losing sight of the significance of a sense of place. Local identity of a location can changes over time. It shouldn't, however, become so removed from the surrounding environment that it blends in with the many other increasingly homogeneous locales.

Neo-Nusantara Characteristics and Guidelines.

The term "Neo-Nusantara" was used to describe traditional ideas that have been combined with contemporary components. The majority of its applications can be found in creative fields such as music, fashion, and even architecture. A grasp of architectural philosophy and theory is the foundation of Nusantara architecture. This type of research delves into a number of different components that exist in formal, tectonic, structural, representational, and aesthetic principles that impact the form of building composition. The term "Nusantara Architecture" refers to a collection of vernacular buildings that were constructed prior to 1800 BC and can be found all around the Malay Archipelago. These buildings share a number of traits with one another as a result of the climate and geography of the area in which they were created. In this part of the article, we will refer to the current way to implementing the Nusantara idea in order to compose it back to the progression of the modern standard as Neo-Nusantara Architecture. Nugroho (2018) mention that, Nusantara's physical forms are greatly impacted by the availability of materials, adaption to the tropical climate, and the culture that created its soul. The method of constructing manifestation is characterized by tradition values as procurement values that must be followed through specific processions comprising various understandings.

Redefining Nusantara Architecture's application is to comprehend the local built environment by recognizing the interconnectedness of environmental conditions, nature, and people. A place inherently possesses the potentials of its natural environment, which can include things like materials, soil conditions, temperatures, and other natural factors that are gifts from God and can serve either as a setting for human life or as a setting for human existence. This is primarily

connected to the concept that underpins the branding of Kota Bharu City, which is the connection between “Human with human,” “Human with nature,” and “Human with God”. Nusantara architecture also needs to serve the value of authenticity based on the original idea, and it deserves not just a form that is carried on from one generation to the next, but also to be accompanied by traditional values that are still passed down from generation to generation and are maintained through rituals and other activities that involve several people working together.

According to Nugroho (2018), the universality of the Nusantara Architecture dimension has fundamentally moved beyond the architectural forms dimension and up to the fifth dimension. The first dimension of the Nusantara system is the observation point. Since every human being has a desire for detail or observation point, the Nusantara architectural style constantly incorporates detail features. The second dimension is a form of ornamental diversity, and the third dimension is the space of Nusantara, which incorporates not only the physical scopes (floors, walls, and roofs), but also the human activities and traditions that are very much approaching the dynamism of local places. The fourth dimension is time, which is a product of further growth from the previous dimensions and is related to the way the atmosphere of space shifts during the day (morning, noon, evening, and afternoon). The energy and cultural factor that ties Nusantara Architecture with the growth of global architecture, which is currently being regarded as the last dimension of architecture, is the fifth dimension of architecture.

METHOD

This study conducts by the qualitative research approach in order to get a in-depth understanding of the framework and the potentiality of Kota Bharu to redefine their actual identity and to comply with the structure of Neo-Nusantara Architecture.

The interview and observation method in this study are to respond to the research questions 1 and 2 on this study.

Research Question (RQ)	Data Sources
RQ 1: What are the local identities of Kota Bharu in respect of urban design and architecture?	In-depth interview and observation
RQ 2: What was the extent of acceptance among the local population towards the Nusantara design concept and strategy in both the areas of architecture and urban planning, with respect to its potential applicability in the Islamic city of Kota Bharu?	In-depth interview and observation

In-depth interviews and field observations were done in Kota Bharu city centre. The interview is to study and understand the current situation of community celebration towards the city in several aspects. In order to provide a framework, there is the need to identify the perception and the acceptance from the local community. All information about the quality lifestyle among the community and also the acceptance towards the approach of Neo-Nusantara architecture has been recorded and presented with direct respondent quotes.

RESULT AND DISCUSSION

In this section, we dissect the data collected from the study’s semi-structured interviews and site visit. The data was then coded deductively, structured, and the features that corresponded to each topic were identified. It’s possible that several candidates will be offered questions that are similar to one another, and that some will be presented unique questions designed to glean specific information from them.

Main RQ: What are the key characteristics of Neo-Nusantara Architecture that can be implemented and adapted to the Islamic City concept of Kota Bharu?

Aim of Research: To examine the attributes of Neo-Nusantara Architecture and to apply and construe its principles within the framework of the Islamic City concept in a Neo-Nusantara context.

Sub RQ	Deductive Codes	Strategy of Inquiry	Inductive codes	
			Coding	Final Theme
1. What are the local identities of Kota Bharu in respect of urban design and architecture?	1. Urban issues in Kota Bharu	- Desk review - Interview	Urban Issues - Low culture and tourism quality affecting local identity. - Issues with public spaces, cleanliness, environmental factors, buildings, and facilities maintenance. - Connectivity and accessibility challenges - Difficulty in presenting local identity through cultural practices - Lack of solid translation of local identity in the majority of new buildings	Theme 1: Unravelling Sense of Place and Cultural Identity in Kota Bharu's Urban Design and Architecture: A Study of Neo-Nusantara Implementation.
	2. Local identity and sense of place implementation		Implementation - Highlighting potentiality for tourism and improving quality of life. - Significance of surrounding context and connections in creating a sense of place. - Integration of old finishes and traditional architectural elements to infuse new spirit and soul into places. - Studying community behaviour through culture to create a sense of place. - Importance of diverse approaches and values to prevent cultural monotony	
2. What was the extent of acceptance among the local population towards the Nusantara design concept and strategy in both the areas of architecture and urban planning, with respect to its potential applicability in the Islamic city of Kota Bharu?	1. Characteristic of Neo-Nusantara	-Desk Review -Interview	Characteristic - Implementation of nature-related elements in urban design and architecture. - Relation and connection between nature and traditional arts and culture - Combination of traditional vernacular and modern architecture in Neo-Nusantara. - Linking Nusantara and Islamic elements through program and celebration. - Influence of Siam on the traditional outlook and craftsmanship. - Diversity among the races in Kota Bharu	Theme 2: Exploring Local Acceptance and Preservation of Cultural Identity in Neo-Nusantara Urban Design and Architecture: A Study of Kota Bharu.
	2. Approach		Approach - Community awareness and involvement in preserving cultural identity - Developing new rules and policies to preserve Nusantara identity in design - Redefining zoning areas in Kota Bharu for better integration and appeal. - Creating elements list for local businesses to follow and comply with - Utilizing commercial sector to educate the community about culture and tradition. - Highlighting community potential through proper platforms	

Theme 1: Unravelling Sense of Place and Cultural Identity in Kota Bharu's Urban Design and Architecture: A Study of Neo-Nusantara Implementation.

In the context of urban design and architecture in Kota Bharu, specifically in connection to the incorporation of Neo-Nusantara principles, the theme focuses on the concepts of a sense of place and cultural identity as they pertain to the built environment. A location's identity and the features that set it apart from others are referred to as its "sense of place," and it is comprised of the singular aspects and traits that make up a location. It takes into account the people's connections and ties with their surroundings, as well as the physical, social, and cultural variables that play a role in forming such connections and relationships. This research investigates the aspects of Kota Bharu that contribute to the city's identity as well as the ways in which these aspects are mirrored in the city's urban planning and architecture. It does so by focusing on the feeling of place that can be found in the area.

Having a strong sense of cultural identification is an important part of having a strong feeling of place. Cultural identity refers to the shared norms, rituals, and practices of a group or region. This research investigates how the local cultural identity is reflected in Kota Bharu's urban planning and architecture, including the inclusion of Neo-Nusantara ideas. The focus of this investigation is on the city's central business district. The term "Neo-Nusantara" refers to a contemporary approach that embraces and reimagines traditional architectural and design features from the Nusantara region, which includes a variety of civilizations from Southeast Asia. We shall study the use of Neo-Nusantara concepts in urban design and architecture in Kota Bharu through the course of our project. In the course of this investigation, we will analyze the present urban problems that are being encountered by the city, such as public spaces, connection, maintenance, and the quality of tourism, and we will investigate how these problems influence the manifestation of local identity. In addition, this study investigates the efforts that have been undertaken to maintain Kota Bharu's sense of place. These efforts include the preservation of historic architectural characteristics as well as the restoration of areas that have been abandoned or underutilized.

The purpose of this research is to shed light on the significance of a feeling of place and cultural identity in the urban planning and design of Kota Bharu. To do so, we have centered our attention on sense of place and cultural identity. In addition, the findings of this study contribute to a better understanding of how the application of Neo-Nusantara principles can form and strengthen the identity of a city, as well as attract tourists and enhance the quality of life for the people that resides there. The essential features of the study question are included into the subject, which draws attention to the significance of local identity, a feeling of place, and the specific setting of Neo-Nusantara principles in the urbanization of Kota Bharu.

The investigation of the one-of-a-kind regional identities and senses of place that are embedded within the urban planning and architecture of Kota Bharu is another focus of this project. The purpose of this research is to gain an understanding of how these components are reflected in the built environment of the city and how they contribute to the formation of the personality and cultural identity of the city. A remarkable case study for investigating the linkages between local identity, a sense of place, and urban architecture may be found in Kota Bharu, which is a city with a rich cultural legacy and a unique Islamic environment. The research will gain insights into how these challenges impact the identity of the city and the urban quality of the city by analyzing the existing urban issues faced by the city, such as the lack of improvement in basic public facilities, the conditions of public transport, and critical issues in public spaces, such as cleanliness, environmental maintenance, building maintenance, and facility maintenance. The research will also gain insights into how these challenges impact the city's infrastructure.

The topic digs even deeper into the perspectives of local citizens with reference to the incorporation of local identities into urban planning and architecture. In spite of the fact that certain efforts have been made to implement local identity in particular regions, the respondents' observations indicate that there are still difficulties to be encountered in terms of efficiency and quality. The purpose of this study is to investigate the variables that contribute to these issues, as well as the degree to which local communities are aware of, and appreciative of, their cultural history as it is reflected in the built environment. In addition to this, the subject places an emphasis on the significance of

urban connectedness and accessibility in the maintenance of a feeling of place and community. An essential part of the research will consist of gaining an understanding of how the primary tourist destinations in the city are geographically distant from the downtown area and how this separation influences the manifestation of regional identity.

Additionally, the growth of heritage cafes that use traditional architecture is indicative of a growing awareness in the city as well as the potential for the preservation of cultural heritage. The purpose of this study is to analyse how heritage cafes like these indicate an effort to consciously maintain local identity and traditional characteristics in contemporary urban environments. In general, the focus of the theme is an in-depth investigation into the distinctive qualities, difficulties, and opportunities presented by the city in terms of its urban planning and architecture. As a result of this research, a more in-depth understanding of the local identities and sense of place in Kota Bharu will be obtained, which will provide invaluable insights for the application of Neo-Nusantara principles and sustainable urban design within the city.

Theme 2: Exploring Local Acceptance and Preservation of Cultural Identity in Neo-Nusantara Urban Design and Architecture.

Within the context of the Islamic city of Kota Bharu, the central focus of this issue is an investigation into the degree to which Nusantara design concepts are accepted and incorporated into architectural and urban planning practices there. This topic focuses on gaining an understanding of how the local populace understands and embraces the Nusantara design idea and strategy, all while taking into account the potential applicability of said concept and strategy within the framework of Kota Bharu's Islamic identity. Kota Bharu is a city that is distinguished from others due to its Islamic culture, extensive cultural history, and diversified population. The purpose of this study is to investigate the distinctive community bonds, religious tolerance, racial and ethnic variety, traditional artistic expression, and cultural practices that give Kota Bharu its unique identity. Understanding the local acceptance of Nusantara design concepts and their possible applications requires these factors, which are vital to the process.

The theme places an emphasis on the significance of community involvement and collaboration in the planning and design of urban spaces and buildings. This underscores the relevance of community activities such as “gotong royong” and “rewang” that help to create strong connections and add to the sense of place in Kota Bharu. The local community's acceptance and comprehension of Nusantara design is significantly influenced by both the Islamic principles that prevail there and the religious tolerance that exists among the city's many diverse faiths. The topic investigates further the incorporation of Nusantara design in urban planning and architecture, with an emphasis placed on the necessity of striking a balance between traditional vernacular components and contemporary architectural techniques. It emphasizes the impact that Siam had on Kota Bharu's traditional worldview and workmanship while simultaneously pushing for the efficient mixing of design elements in order to avoid overdesign.

In addition to this, the topic investigates the possibility of incorporating Nusantara design by making use of Islamic celebrations and activities. It is acknowledged that the translation of Nusantara and Islamic features does not primarily lay in the physical aspects themselves, but also in the ways in which the spaces are used and accepted. Within the context of Kota Bharu's urban fabric, the research investigates the spirit of space and how it embodies Islamic principles, thereby contributing to the strengthening of cultural identification and appreciation within the city. A research question's theme should encompass the most important components of the question. It focuses on the extent of local acceptability, the integration of design concepts from Nusantara, the role that community engagement plays, and the harmonization of Islamic values within the urbanism of Kota Bharu.

In addition to this, the theme investigates the vitally important topic of maintaining cultural identity through the process of urban planning and investigates the level of local acceptance towards the adoption of Neo-Nusantara architectural principles in Kota Bharu. Kota Bharu is a city with a strong Islamic legacy and different cultural traditions; as such, it provides a one-of-a-kind case study for gaining a knowledge of how concepts and tactics from Nusantara design

can be implemented in the setting of an Islamic city. This subject places an emphasis on the necessity of striking a balance between modernity and tradition, highlighting the relevance of cultural preservation in the decisions that are made regarding urban development. The research will give light on how these design components can be effectively integrated into the urban fabric of Kota Bharu in order to maintain its cultural identity and sense of place by shedding light on the defining aspects of Neo-Nusantara, which will be explored in the research.

The theme also focuses on the various ways provided by interviewees with the purpose of fostering the acceptance of Neo-Nusantara ideals among the populace of the local area. This includes teaching the community about the cultural identity and traditions that they hold, demonstrating the possibilities for promoting identity through appropriate platforms, and involving local authorities and companies in the efforts to preserve the culture. Understanding the connection that exists between Islamic principles and the Nusantara aesthetic is an essential part of the investigation that is being carried out here. You can determine the extent to which Islamic beliefs impact urban planning decisions and architectural designs by examining the way in which the Islamic city of Kota Bharu understands and applies the ideas of Neo-Nusantara.

In addition to this, the theme explores the influence that community participation and the activities of local government have had on the urban landscape of Kota Bharu. The city has the potential to develop into an environment that is more vibrant and dynamic, which is congruent with its cultural identity, if zoning districts are redefined and commercial, recreational, historical, cultural, and communal spaces are integrated throughout the city. In addition, the research intends to shed light on the difficulties and potential benefits involved in putting Neo-Nusantara into practice in Kota Bharu. This includes conducting research into the ways in which political difficulties have affected cultural performances and artistic endeavors in the city, as well as determining methods by which these obstacles can be overcome and culture and arts can be reconnected using a novel strategy and framework.

CONCLUSION

The study explored the local identities of Kota Bharu with a specific focus on urban design and architecture. The deductive framework centered on “local identity and sense of place implementation” and “urban issues in Kota Bharu.” Through the interviews, valuable insights were gained about the current condition of the city’s plan and architecture in terms of implementing local identities.

The findings highlighted some urban issues that have impacted the manifestation of local identity in Kota Bharu. Issues such as a lack of improvement in basic facilities, deteriorating public transport, cleanliness, environmental challenges, and maintenance problems have affected the city’s overall identity. Additionally, the separation of main attractions from the city center has posed challenges in presenting local identity through cultural practices.

However, amidst these challenges, there were positive signs of progress. The emergence of heritage cafes and efforts to implement traditional architecture in modern settings showcased the city’s awareness and intention to preserve its cultural identity. Yet, there remains a need for greater integration between urban planning and cultural heritage to create a more sustainable and cohesive identity for Kota Bharu.

The limitations of the research provided valuable insights for future studies. Researchers should focus on establishing collaborative partnerships with local artists, cultural practitioners, and institutions to gain deeper access to the city’s cultural scene. Utilizing mixed research methods, including virtual techniques, can overcome challenges related to limited access and awareness. Longitudinal studies could offer a better understanding of the evolving local identity and its influence on urban planning over time.

Moreover, fostering public awareness and engaging local residents as co-researchers will help enhance understanding and appreciation of local heritage, strengthening community involvement in preserving and promoting Kota Bharu’s cultural identity.

In conclusion, by addressing these limitations and following the recommendations for future research, scholars can contribute to a more comprehensive understanding of Kota Bharu's local identities and their integration into urban design and architecture. This holistic approach will pave the way for sustainable urban development that preserves the city's unique cultural heritage while creating a distinct sense of place for residents and visitors alike.

ACKNOWLEDGEMENT

All praises to Allah and His blessing for the completion of this thesis and for all the opportunities, trials and strength that have been showered on me to finish writing the thesis. Throughout this process, I learned a great deal about myself, both personally and academically. First and foremost, I would like to express my deepest thanks to my supervisor, Dr Nor Azlina Abu Bakar, for her direction, understanding, and patience, but most importantly for his encouragement and warmth in helping me complete my thesis. It has been a great pleasure and honour to have her as my supervisor.

I also would like to express my deep thanks to Dr. Mohd Zairul Bin Mohd Noor, my dissertation subject coordinator, for providing me with a preliminary overview of the research for my dissertation paper and for planning all the talks and lectures that has been done in my learning more about the dissertation writing process. Finally, my deepest gratitude goes to all my lecturers, family and friends and who were with me and supported me through thick and thin. Without their assistance, I could not have written my thesis.

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INVESTIGATING HERITAGE-LED URBAN REGENERATION STRATEGY FOR THE HISTORIC DISTRICT OF SEREMBAN

Chen Lit Ying, Nor Azlina Abu Bakar

ABSTRACT

Due to the accelerating urbanisation and population growth, there is growing concern about how to regenerate the deteriorated areas of old cities. Various signs of urban degradation are currently present in Seremban's historic centre. A novel strategy for halting legacy deterioration and preserving the growth of historic cities is known as "heritage-led regeneration." However, in the context of Malaysia's historic cities' redevelopment projects, there is a lack of a design requirement for a heritage protection strategy. In order to revive the dilapidated portion of Seremban's historic centre, the research intends to investigate the historical conservation strategy in the project. In order to evaluate the need for a regeneration project and offer the best heritage conservation plan for design of a regeneration project in Seremban's historic centre, the research will undertake a qualitative study through observation, desk review, and in-depth interviews. This study will offer a design brief for a rehabilitation project for the historic district of Seremban and help the area become more livable and sustainably developed. More variables may be added in future studies to the design brief study that has already been done.

Keywords: *Heritage-led Regeneration; Historic Cities; Conservation Strategy; Urban Regeneration; Seremban.*

INTRODUCTION

Heritage cities in Malaysia are currently dealing with more severe urban issues as a result of growing urbanisation, economic development, and population expansion. In Malaysia, new townships have been built on the outskirts of numerous old cities, subjecting them to intense pressure from commercialization, subpar architecture, and cultural uniformity that has eroded their sense of place. The idea of bringing new, modern development to historic districts, revitalising the areas, and renovating historic buildings—often referred to as the tools for the improvement schemes of the cities—are central to Malaysia's development program for historic cities. But many regeneration initiatives have failed to incorporate building conservation into their plans, and as a result, the old structures are typically demolished and replaced with new construction. (Said et al. 2013)

Kuala Lumpur, Penang, Melaka, and Taiping Local Authorities are leading the charge in implementing conservation-based policies to regenerate historic places in their Special Area Plan. The measures and initiatives taken by the local authorities to address the issues facing Malaysia's historic cities include zoning for conservation and buffer zones, pedestrianising heritage cities, diversifying tourism offerings, managing heritage and tourism, and local participation in heritage conservation. (Said et al. 2013) Urban regeneration initiatives are thought to breathe new life into historic locations by preserving the original community and enhancing their standard of living while also restoring the heritages' identity and the wealth of the illustrious past of historic cities. (Mansor & Said, 2012) Promoting growth that may enable the local populations of Malaysia's ancient cities to carry on with their traditional ways of life in newly revitalised physical environments while retaining their sense of place is the problem that faces urban regeneration in the country. A new, creative design that supports the demands of contemporary lifestyles with effective conservation work could help increase the value of the buildings.

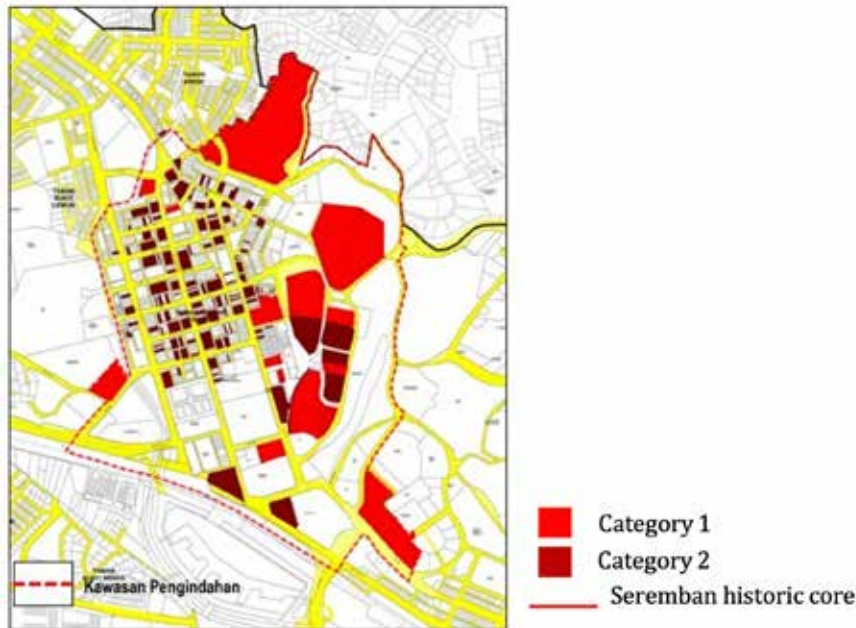


Figure 1: Map of Seremban historic core

Source: Rancangan Kawasan Khas Pusat Bandar Seremban 2025

In the context of the research, the focus is specifically on the 160 hectare historic core of Seremban. Seremban historic core is located in the heart of Seremban city, within the district of Seremban, Negeri Sembilan, Malaysia. It comprises the central area of the city where historical buildings, cultural sites, and traditional architecture are concentrated. According to Rancangan Tempatan Malaysia Vision Valley 2045 (RTMVV 2045), Seremban city centre as the main historic urban core of Seremban plays an important role for smart tourism, edu- tourism and heritage tourism.

However, due to rapid urbanization, Seremban historic core is exposed to various physical deterioration symptoms of urban decay especially the derelict and lack of conservation of historical buildings, hence declining of place characteristics where the dramatic changes to the replacing historical buildings and diminishing of place meanings. The abandoned buildings and commercial sites have also discouraged the owners/investors to initiate new business ventures or cultural projects. There is a lack of practice for conservation of heritage in Seremban historic core in the context of urban regeneration, conservation and sustainability. (Laporan RKK Pusat Bandar Seremban 2025). Hence, there is a need to revitalize the old town and safeguard its image as a heritage site.

The traditional approach of conservation that concentrates on building preservation such as listed buildings will not safeguard the urban heritage and secure the sense of place of the historic cities (Shamsuddin and Sulaiman, 2002). Vast majority of methods and action plans of identifying and protecting built heritage are often stalled at the designation (listing and conservation areas) stage, where intervention strategies are more suitable to deal with a singular heritage asset rather than with a whole urban heritage area and the many other less tangible features of townscape (Steinberg, 1996). The drawback of historic conservation in relation to urban regeneration in Malaysia is the failure of stakeholders to think of conservation as a holistic approach. Conservation is merely based on the restoration and maintenance of individual buildings. Heritage-led regeneration is a new approach to prevent decay and decrepitude of cultural heritage in most of important historical areas. (Said and Rahmat, 2014). Hence, this research aims to investigate the heritage conservation strategy in a regeneration project to revitalize Seremban historic core. The following are the research objectives of this paper:

1. To identify the requirement of a regeneration project in a historic core and to investigate the current heritage conservation strategy.
2. To recommend best practice of heritage conservation strategy to regenerate Seremban historic core.

LITERATURE REVIEW

Conservation Scheme for Seremban historic core

While the rapid development of new commercial and residential townships is focused on neighbouring townships such as Seremban 2, Seremban 3, Bandar Ainsdale, and Bandar Sri Sendayan, Seremban's authority introduced a conservation scheme for Seremban's historic core in the Special Area Plan (Rancangan Tempatan Kawasan Khas Pusat Bandar Seremban 2025), which was then replaced by the Malaysia Vision Valley Development Plan 2045 (RTMVV 2045). The scheme drew up an urban revitalization plan for the city centre of

Seremban, which included the preservation and conservation of heritage buildings and heritage locations with the following goals in mind.

- i. Preserving Category 1 heritage buildings/monuments and Category 2 shophouse buildings with potential as urban heritage relics for future generations.
- ii. Providing heritage tourism attraction areas.
- iii. Maintaining the most significant heritage areas in Seremban.
- iv. Enhancing the image of Seremban's heritage areas and promoting the Heritage and Food Trail as a tourism attraction.
- v. Enhancing the image of Seremban's old town cultural heritage and institutional zone as intangible heritage and positioning it as one of the heritage destinations that preserves a unique, colorful, and disabled-friendly socio-cultural and urban environment.
- vi. Transforming the heritage areas into pedestrian-friendly and safe urban concepts that can be visited at any time.

Below are the five focuses in the urban revitalization plan for Seremban historic core

- i. Maintenance and development of conservation areas
- ii. Preservation and restoration of buildings/monuments and heritage areas (22 nos of Heritage Buildings)
- iii. Preservation of main recreational areas
- iv. Old town heritage trail
- v. Heritage and food trail

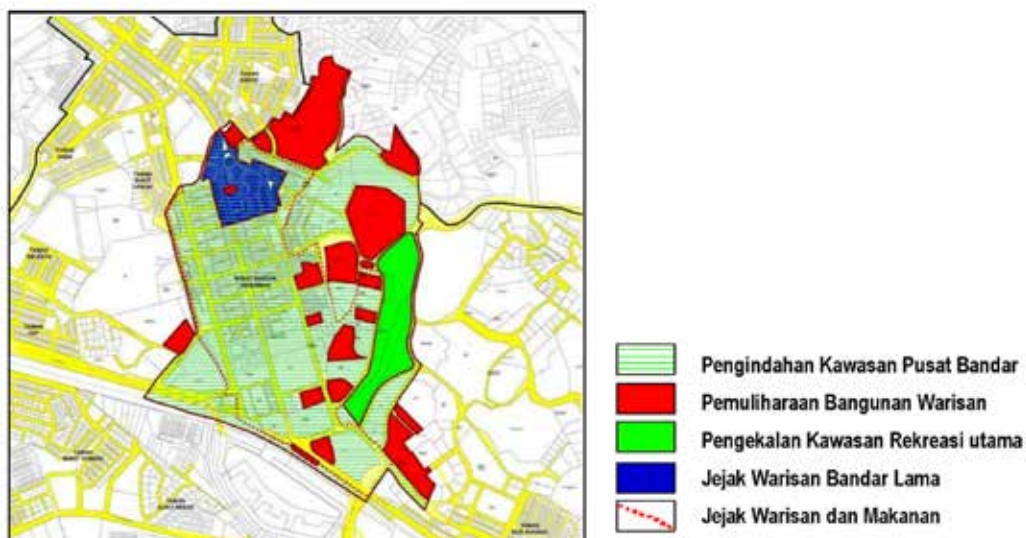


Figure 2: urban revitalization plan of Seremban's conservation area

Source: Rancangan Kawasan Khas Pusat Bandar Seremban 2025

Besides, the government also provide incentives to the owners of the historical buildings to encourage them to conserve their properties (shophouses).

- i. Exceptions from land surrender for road widening, building setbacks, and rear/side lanes.
- ii. Exceptions from providing physical parking where applicants can pay in lieu of parking provision (in-lieu). The percentage of physical parking exemption for Infill / Reconstruction development and Category 2 buildings is subject to the local planning authority.
- iii. Permission for adaptive reuse of buildings from existing use, subject to compliance with heritage development control rules and heritage building design guidelines.
- iv. Other incentives subject to the local planning authority.

Urban regeneration

Urban regeneration, also known as urban renewal, relates to the endeavour of enhancing the state of urban neighbourhoods, particularly those that are deemed dilapidated and historic. Meanwhile, heritage-led regeneration is a notion that centres on the revitalization of historic urban areas, which has prompted the implementation of programmes aimed at ameliorating the historical environment and averting the deterioration and decline of cultural heritage in significant historical zones. The authors of the aforementioned study are Said et al., and their work was published in 2013. In urban contexts, the term “regeneration” is commonly employed to encompass a wide range of initiatives aimed at fostering economic development and enhancing the livability of urban areas, including smaller-scale projects. A triumphant revitalization is a form of transformation that reinstates the social, economic, and environmental vitality of a particular location. The objective of urban regeneration is to augment the surroundings and guarantee their persistence as a favourable habitat. Consequently, it is imperative to preserve the historical infrastructure of the intended revitalised region to uphold its linkage with the bygone era since collective cultural and spiritual convictions can augment the worth of the legacy resources and can act as a motivating factor for their safeguarding.

Eni et al. (2020) highlights the significance of the urban regeneration concept in mitigating urban sprawl and promoting urban renewal and transformation. The introduction of strategies aimed at regenerating urban spaces was initially motivated by the need to circumvent new land uses. The proposed approach is founded upon fundamental principles aimed at enhancing spatial efficiency, promoting social cohesion, and optimising energy consumption. The process of urban regeneration has the potential to incorporate various elements such as residential functions, work-compatible activities, sufficient facilities and spaces, cultural and social integration, as well as leisure and sport facilities.

Regeneration Project in Historic Areas

Heritage cities in Malaysia encounter a range of challenges, including the emergence of new design township development, depopulation of inner city areas, intensifying and unregulated development pressures, insufficient legislative measures and enforcement, evolving lifestyles and consumption patterns of urban residents, the anticipation of new tourists, heightened public awareness, and environmental degradation. In order to address these challenges, it is believed that implementing an urban regeneration initiative can revitalise heritage sites by restoring their identity and showcasing the wealth of the prestigious past of historic cities. This approach also involves retaining the original community and improving their quality of life. The reference cited is Mansor and Said (2012). Lei and Zhou (2022) emphasised that an urban regeneration initiative must prioritise the preservation of a city’s continuity and authenticity, as these factors are essential elements of its place identity. Eni et al. (2020) has asserted that the absence of conventional sources of funding from public and private stakeholders has impeded the progress of numerous regeneration initiatives, thereby posing a significant challenge to urban regeneration policies. According to Lee et al. (2009) research, sustainable urban renewal design encompasses economic, environmental, and social aspects. According to Chahardowli et al. (2020), sustainable regeneration is achieved through the interplay of four dimensions: physical, economic, social, and cultural. These dimensions are integral to the revitalization of historic urban centres, a goal shared by all regeneration strategies.

Concept of Heritage-led Regeneration

Said et al. (2013) assert that heritage-led regeneration encompasses six key investment components that are directed towards the preservation of property, land, capital, human resources, heritage resources, and political commitment. According to Elseragy et al. (2018), there is evidence to suggest that a city's economic success is linked to the differentiation of its shape, as demonstrated by successful examples of heritage-led regeneration. According to Burham (2022), the implementation of heritage-led regeneration initiatives has the potential to yield positive outcomes across various societal domains, including community life and the public realm. Additionally, regeneration that is led by heritage has the potential to make a significant contribution to economic development, function as a focal point for community social activities, and generate prestige and tourism. Elseragy et al. (2018) emphasised the significance of the social public realm within urban heritage contexts for the purpose of regeneration and sustaining vibrancy. The authors suggest that involving local communities in the regeneration process is crucial to achieving these goals. Ghafoorikoohsar (2010) posits that the implementation of heritage-led regeneration can result in the establishment of a robust local and regional identity. This approach to regeneration is deemed inclusive, particularly in addressing social issues such as social exclusion within a multicultural community. The studies have provided an overview of the correlation between economic growth, the preservation and rehabilitation of cultural built heritage, and the social benefits of regeneration initiatives driven by heritage.

Heritage-led Regeneration in Melaka and Georgetown

The utilisation of heritage serves as the foundation for tourism endeavours and the advancement of the historic nucleus in the historic city of Melaka. The findings of a study conducted between 2010 and 2016 on a heritage-led regeneration scheme implemented in the historic area of Melaka demonstrate that such schemes have had a positive impact on the streetscape and have resulted in the creation of higher-quality spaces that benefit all stakeholders. A significant improvement was observed in the majority of the streets as compared to their previous state. The introduction of novel economic pursuits in the region has resulted in a significant influx of tourists. According to Shahrul's work in 2016, The primary objective of the regeneration efforts in Melaka is to enhance its economic viability by promoting inbound tourism. Consequently, there has been a rise in the construction of high-end hotels and commercial establishments to accommodate the growing influx of tourists. The erection of extensive high-rise, mixed-use edifices may potentially contribute to the deterioration of the cultural significance of the traditional structures and obscure the importance of the historic regions. The redevelopment scheme of Melaka is characterised by the conversion of various buildings, such as town halls to offices, warehouses to museums, and government offices to other uses. The conversion of the building has contributed to the economic growth of the area by introducing new sources of revenue. However, this transformation has also disrupted the historical context of the site by introducing gentrification, which has altered the demographic and population makeup of the area. The study conducted by Said et al. in 2013 is referenced.



Figure 3: Dutch Square, Malacca
Source: Author, 2017

The regeneration strategy implemented in George Town is a socially-oriented approach aimed at generating a multiplier effect to foster the economic development of the region. The preservation of George Town's heritage is primarily entrusted to the diverse communities that reside within its boundaries. The preservation of George Town's physical form, as well as its social and cultural aspects, is attributed to the perpetuation of traditional businesses, traditions, and activities. Since the 1990s, the government has provided support for these activities due to their contribution to the distinctive multiculturalism of Penang, thereby enhancing its appeal as a heritage city. (UNESCO) Additionally, it has been recognised by the Penang Structure Plan 2020 that the adaptive reuse of traditional shophouses is imperative for the revitalization and economic advancement of George Town. Hence, it is imperative that preservation efforts pertaining to the heritage structures adhere to the regulations outlined in the George Town Inner City Conservation Area Guidelines. The transformation of Melaka's historic site has been influenced by the pursuit of tourism-related benefits and modernization, resulting in gentrification and a shift in its original character. Regeneration efforts in Malaysia primarily centre on implementing initiatives aimed at revitalising a location with the goal of achieving enhancements in social, economic, and physical aspects. According to Shamsuddin and Sulaiman (2002), the majority of regeneration initiatives in the historical cities of Malaysia prioritise the revitalization of areas by introducing new activities while simultaneously preserving the historic fabric in compliance with local regulations and policies.



Figure 4: Lebuhr Armenian, George Town
Source: Author; 2023

Conservation Strategy in Melaka and Georgetown

The unique characteristic of the historic core of Melaka which has been the administrative zone for different governments at different periods, has made the historic buildings within its compound suitable to be adapted to new uses, as commercial buildings, where the main tourism activities take place. Conservation activities in the historic core of Melaka involved preservation, adaptive reuse and building and minor restoration. The Special Area Plan 2010 which encompasses the Conservation Management Plan for the Melaka Historic City was a guideline for the development agendas in Melaka, which also include the regeneration schemes.

Georgetown's heritage conservation awareness dates back to 1974, when the former City Council of George Town introduced the Interim Zoning Plans 1/73, which served as the city's inaugural comprehensive land-use zoning plan. This Conservation Plan emphasised the significance of preserving the social and historical environment within the inner city, thereby preventing the degradation and demolition of its historic segment. Said et al. (2013)

reported that the conservation efforts in Georgetown encompass the restoration of communal areas, such as Armenian Park, China Street Ghaut, and Lebuhr Light. The landscape interventions'

design, which was funded by the City Council of Penang Island and developed by Think City, was informed by historical photographs and documentation. The design prioritised community uses and habitability.

Conceptual Framework

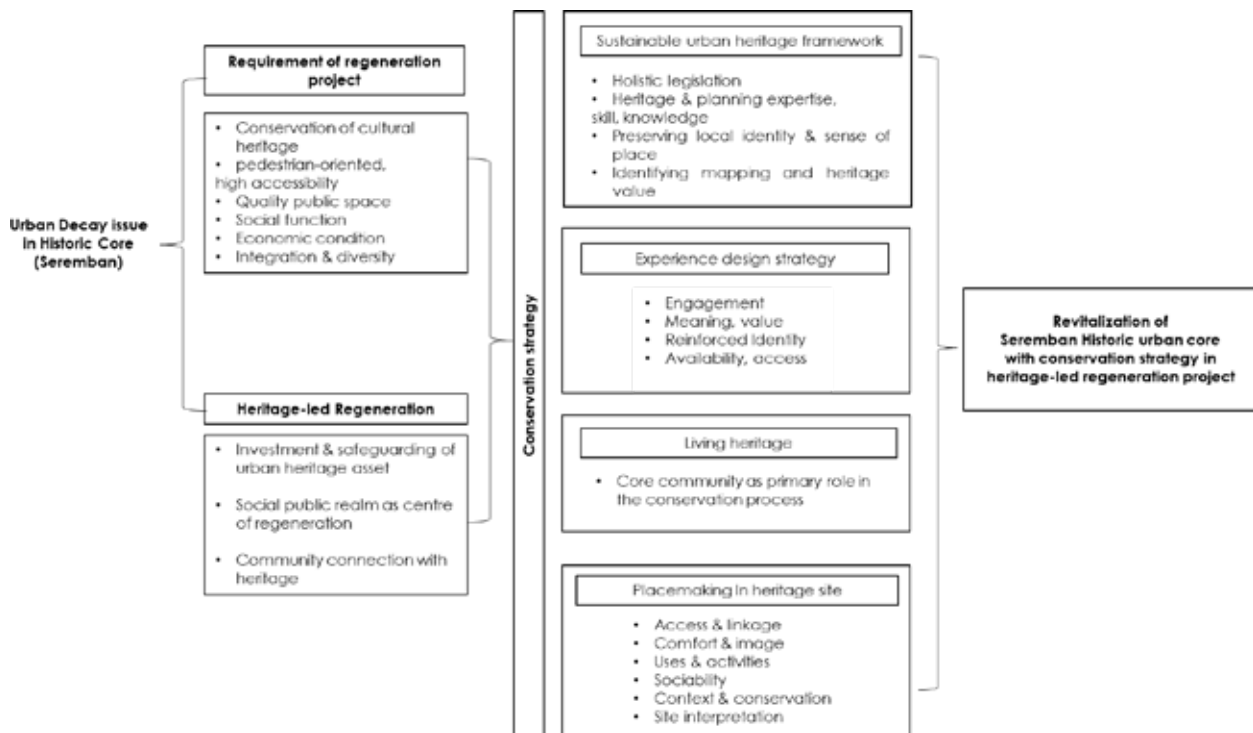


Figure 5. Conceptual framework

Source: Author, 2023

The conceptual framework highlighted the requirements to be considered in a regeneration project include conservation of cultural heritage, pedestrian-oriented, good accessibility, quality public space and so on. Studies show that regeneration project in historic area shall safeguard the urban heritage asset, connect the community to the heritage and highlighted the important of social public realm. Besides, there are various heritage conservation strategies can assist in heritage-led regeneration as a holistic approach instead of only preservation or conservation of individual listed building. These could be applied in regeneration project in Seremban historic core to revitalize the decaying part of the area and strengthen its identity as a city of heritage and culture.

METHOD

The research has employed a qualitative research methodology to obtain the necessary data for analysis, in accordance with the research aim and research question. The data collection phase of this study incorporated various methodologies, namely in-depth interviews, desk reviews, and case studies. The primary data were acquired through in-depth interviews, whereas the secondary data were gathered from desk reviews and case studies. The data collection regarding of the design considerations and requirements in heritage-led regeneration scheme was conducted through the review of initial information which includes cases citation, official publications of the relevant authorities as well as articles in journal and mass media. In the context of the research, the focus is specifically on the historic core of Seremban whereas the historic urban centre of two cities, Melaka and George Town, were selected as main case studies due to their observable heritage-led regeneration schemes. The research adopted purposive sampling as its sampling strategy. This approach focuses on identifying information-rich cases that provide valuable insights, making the data collection process more focused, relevant, and efficient.

The research centred on utilising a qualitative interview methodology to gather primary data. The primary objective of the interview was threefold: firstly, to ascertain the extant policies, measures,

and future plans of the local authority with regard to the management of the Seremban historic core; secondly, to gauge the perceptions of the local communities regarding the conservation of local heritage; and thirdly, to explore the optimal approach to heritage conservation strategy for a regeneration project in Seremban. The local authority representatives are comprised of a town planning officer and a professional architect, while the representatives of the local communities include significant personnel from the local heritage body and ordinary business owners within the historic core of Seremban. As a result, two distinct sets of semi-structured interview questions were formulated, tailored to the unique backgrounds, knowledge, and perspectives of interviewees from the local authority and individuals within the local communities.

The research conducted thematic analysis to interpret the qualitative interview data by identifying common themes, topics, ideas and patterns of meaning that come up repeatedly. The data was organized by using ATLAS.ti. as it helps in reducing the data set into a more concise form that allows for a more feasible analysis. In thematic analysis, codes and themes are forms of data reduction that address this need. By using an analysis software, the researcher can “code” the data by applying short but descriptive phrases to larger segments of data to summarize them for later analysis.



Figure 6. Process of data analysing using ATLAS.ti.
Source: Author, 2023

RESULT AND DISCUSSION

The transcriptions of the interviews are analysed as supportive data, and a thematic analysis matrix was utilized to organize the identified codes and develop themes from them. To answer Sub RQ 1, five key themes emerged as essential requirements were identified: 1) Conservation and Preservation, 2) Governance and Collaboration 3) Cultural Integration, 4)Urban Planning, and 5) Economic Development and Entrepreneurship. To answer Sub RQ 2, four final themes emerged for an effective heritage conservation strategy were identified

: 1) Heritage building conservation, 2) Adaptive reuse and integration, 3) Public space revitalization, and 4) Community engagement and awareness.

Table.1 Thematic Analysis Matrix

Main RQ: How heritage conservation strategy assists regeneration projects to revitalize Seremban historic core?			
Aim of research : To investigate the heritage conservation strategy in regeneration project to revitalize Seremban historic core.			
Sub RQ 1: What are the requirements a regeneration project in Seremban historic core?	Deductive	Inductive Codes Coding	Final Theme
	- Requirements a regeneration project	• Façade preservation • Heritage preservation and conservation • Gazetting support	Conservation and Preservation
	- Heritage-led regeneration	• Public-Private cooperation • Compliance to local plans	Governance and Collaboration
		• Integration with local food • Integration with local events	Culture Integration
		• Pedestrianization • Streetscape enhancement • Traffic and parking management • Safety and security	Urban Planning
		• Reinvention of craftsmen Industries • Unique business concept	Economic Development and Entrepreneurship
Sub RQ 2: What is the best practice of heritage conservation strategy to regenerate Seremban historic core?	- Heritage conservation strategy		
		• Building preservation • Facade enhancement • Structural maintenance	Heritage building conservation
		• Adaptive reuse • Integrating with local culture	Adaptive reuse and integration
		• Vibrant activity • Public space design • Mural art • Placemaking	Public space revitalization
		• Community engagement • Heritage awareness	Community engagement and awareness

Requirements a regeneration project in Seremban historic core

Based on the primary data and secondary data, the requirements of a heritage-led regeneration project both emphasizes the need to protect and safeguard historical and cultural heritage sites and structures. In urban regeneration initiatives, it is crucial to prioritize the preservation of a city's continuity and authenticity, as these factors are fundamental elements of its place identity. (Lai and Zhou, 2022) By preserving the heritage assets, local communities can maintain a connection to their past, promote cultural diversity, and foster a sense of pride and belonging. Besides, government policies also play important role in preventing the unnecessary changes of heritage building and heritage building retention in a historic district. (Wan Ismail, 2018)

A regeneration project shall consider involving both public and private entities in the planning and implementation processes for more comprehensive and successful outcomes. Chahardowli (2020) highlighted that a regeneration project can embrace participatory approaches by actively involving local stakeholders in the process in order to enhance social management and promote community empowerment. Collaboration between public and private sectors will allow for the pooling of resources, expertise, interest and diverse perspectives, which can contribute to effective decision-making and the achievement of shared goals.

The study also found that local community is aware that Seremban historic core is rich of multiracial characteristics, local delicacies and local trading culture. Chahardowli (2020) stated that development strategies for historic cores can effectively incorporate functional features, physical characteristics, local and seasonal retail, stakeholder participation, cultural and religious events, as well as creative and native culture. Hence, it is suggested that a regeneration project shall consider integration with local culture to response to the site context.

The study revealed that the urban planning of Seremban historic core is perceived as lacking in effectiveness, primarily due to inadequate parking space and persistent traffic congestion issues. These issues not only hinder the development of Seremban historic core, it also discouraged new business venture inside the dense city centre. Given the evolving transformation of the Seremban historic core into a heritage-tourism district, it becomes imperative to address these urban planning challenges by prioritizing pedestrian-friendly design. According to Hew et al. (2014), the focus of revitalization efforts should prioritize meeting the needs of the local communities rather than solely aiming to benefit from tourism development. Moreover, it is also crucial to enhance the safety and security in the old town especially during evening and night time as most shops in the town will be closed down in evening.

Based on interview findings, Seremban as a traditional business district shall inject new and young business such as reinvention of craftsmen industries and incorporate unique business concepts as means of fostering economic development in urban regeneration. Burnham (2022) highlighted that successful urban regeneration initiatives are not solely the outcome of government leadership but also involve social enterprises generated by civic interest and entrepreneurship. Hence, a regeneration project shall consider active participation of social enterprises, civic interest and entrepreneurship, as it helps to add dynamism, creativity, and community engagement to the regeneration process.

Heritage Conservation Strategy to regenerate Seremban Historic Core

To investigate the suitable heritage conservation strategy for regeneration project in Seremban historic core, the interview data reinforced and complemented the findings from the existing literature, providing real-life examples and perspectives of strategy in heritage conservation.

Building preservation, facade enhancement and structural maintenance are important strategies in conserving Seremban historic core because the site is currently plagued with high numbers of dilapidated heritage buildings, particularly the traditional shophouses. Abdullah (2012) emphasised that a regeneration project shall consider compatibility, visual harmony, meaning, and appropriate architectural design tools to respect the authenticity and achieve aesthetic fitness in a historical context. This helps to preserve the historical and cultural significance of the overall historic site, enhance the visual of townscape, and ensure the safety and longevity of the buildings' structures.

According to architect from Seremban City Council, the successful adaptive reuse projects in Seremban are LEHPAK Café, Bunga & Gula Café and Seremban Citizen Gallery. These projects have reused the original building and turn it into vibrant and attractive spots in the old town. This practice not only conserved the heritage assets in the old town, it also saves energy, resources, and emissions that would otherwise be required for demolition and construction of new buildings. Furthermore, Chahardowli (2020) suggested that incorporating functional features, physical characteristics, local and seasonal retail, stakeholder participation, cultural and religious events, as well as creative and native culture, can help to develop historic cities.

Next, effective heritage conservation strategies in urban regeneration involve the integration of vibrant activities and elements such as public space design, mural art, and placemaking. Lorong Seni Seremban, a 500-meter-long street art attraction, exemplifies the concept of “Returning the street to the public.” This initiative aims to provide a space for tourism, leisure, and placemaking activities. To breathe life into the area, the local government encouraged local street vendors to establish their businesses in Lorong Seni. According to Samir et al. (2019), creative placemaking is an approach that promotes cultural and social vibrancy through activity-based interventions. Additionally, Dreyfuss et al. (2013) suggests that urban spaces should maintain a balance between heritage preservation and creative architectural elements to ensure their vitality. By revitalizing public spaces within heritage sites, it is possible to enhance the overall sense of place, encourage community engagement, and promote local culture and heritage.

Lastly, the study found that there is a lack of awareness among the local communities regarding heritage conservation and it has contributed to one of the reasons of the abandonment and demolition of heritage shophouses in the town. Said et al. (2013) emphasizes the importance of public awareness as a crucial element in urban conservation processes. It is essential to actively involve and empower the local communities in order to nurture a heritage community. This involvement allows stakeholders to ensure that regeneration efforts align with the needs and aspirations of the local communities. Additionally, stakeholders should play a role in policy design and enforcement to effectively address heritage conservation concerns. By promoting awareness and involving the community, it becomes possible to mitigate the issues of abandonment and demolition, fostering a more sustainable approach to heritage preservation and urban regeneration.

CONCLUSION

This study attempts to provide a useful resource for regeneration initiatives in the historical cities of Malaysia. Currently, there is a shortage of comprehensive guidelines for heritage- focused revitalization projects in towns beyond Melaka and Penang. Therefore, this research focuses on the historic core of Seremban as a case study to create a customized design brief that considers the area’s distinctive features and the obstacles associated with urban decline.

The study highlights several important practical implications for the regeneration of Seremban’s historic core. These implications revolve around conservation and preservation, governance and collaboration, culture integration, urban planning, economic development and entrepreneurship, as well as heritage conservation strategies. The research emphasizes the need to prioritize the protection and safeguarding of historical and cultural heritage sites and structures in heritage-led regeneration projects. It stresses the importance of preserving a city’s continuity and authenticity as fundamental elements of its place identity. Government policies play a crucial role in preventing unnecessary changes to heritage buildings and promoting their retention in historic districts.

The study also highlights the significance of governance and collaboration, advocating for the involvement of both public and private parties in planning and implementation processes. This collaborative approach allows for the pooling of resources, expertise, and diverse perspectives, leading to more comprehensive outcomes. Next, integrating local culture into regeneration projects is another vital aspect, as it responds to the context of the site and acknowledges the multiracial characteristics, local delicacies, and trading culture present in Seremban’s historic core. By incorporating functional features, physical characteristics, and cultural events, the regeneration process can effectively enhance the vibrancy and uniqueness of the area.

The study further highlights the importance of addressing urban planning challenges, such as inadequate parking space and traffic congestion, by prioritizing pedestrian-friendly design. Additionally, the need to enhance safety and security, particularly during evening and night time, is emphasized to encourage the growth of businesses within the dense city center. Furthermore, economic development and entrepreneurship are identified as key factors in the regeneration process. The study suggests injecting new and young businesses, reinventing craftsmen industries, and incorporating unique business concepts to foster economic growth. It highlights the value of social enterprises, civic interest, and entrepreneurship in adding dynamism, creativity, and community engagement to the regeneration process. Moreover, the research stresses the significance of heritage building conservation, adaptive reuse, public space revitalization, community engagement, and awareness. These strategies contribute to preserving the historical and cultural significance of the area, enhancing the overall sense of place, encouraging community participation, and fostering sustainable approaches to heritage preservation and urban regeneration. By considering and implementing these practical implications, stakeholders and decision-makers can guide the regeneration of Seremban's historic core towards a more sustainable, culturally vibrant, and community-centric future.

The limitations in the research include a lack of comprehensive written investigations on the heritage significance and conservation movements specific to the Seremban historic core, which hindered analysis and understanding. Accessing archival information from local authorities and NGOs was challenging, limiting historical data and records. Socioeconomic and physical data on the area, such as demographics, economic indicators, building demolitions, and abandonment rates, were insufficient or inaccessible. Further research and data collection are necessary to bridge these gaps in understanding the heritage significance, conservation efforts, and socio-economic aspects of the Seremban historic core.

Besides Seremban historic core, there are also other historic sites in various states of Malaysia that are facing deterioration due to urban decline. While heritage-led regeneration initiatives have the objective of revitalizing and preserving these areas, they are not without limitations. Therefore, future research can concentrate on exploring different conservation initiatives implemented in various historic cities across Malaysia. Simultaneously, it is crucial to analyze the drawbacks of heritage-led regeneration in historic areas to provide a more comprehensive understanding of the limitations associated with these initiatives and offer valuable insights into effective strategies to overcome them. Therefore, this knowledge can contribute to the development of more inclusive, sustainable, and socially beneficial approaches to heritage-led regeneration of historic areas in Malaysia.

ACKNOWLEDGEMENT

The author would like to express sincere appreciation for the guidance and support provided by their supervisor, Dr. Nor Azlina Abu Bakar, and subject coordinator, Dr. Zack. The author also appreciates all the group mates, friends, tutors, and family for their unwavering support throughout the research.

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INVESTIGATING THE COMMUNITY DINING SPACE THROUGH MALAYSIAN'S FOOD CULTURE IN KUALA LUMPUR

Wong Zi Chen, Wan Srihani Wan Mohamed,

ABSTRACT

Urbanization has profoundly impacted the food habits of inner-city populations, leading to the loss of cultural foodways, demographic shifts, and changes in urban economies. This has resulted in the emergence of food as a critical aspect of urban policy and the displacement of low-income individuals. Simultaneously, intentional marketing campaigns have sought to reshape global food cultures emotionally, exacerbating food inequality and transforming food landscapes in cities. This research focuses on investigating the potential of community dining spaces with Malaysian food culture to enhance the livability of inner-city areas. Through quantitative methods including desk reviews and questionnaire surveys, perceptions of community dining designs in Bukit Bintang, Kuala Lumpur, will be explored. The study aims to examine cultural food habits influenced in the overdeveloped urban area of Bukit Bintang, particularly for low- and average-income communities. Additionally, this research contributes to understanding the design of community dining spaces for local communities in Malaysian cities. Future research can delve into the suitability of incorporating food cultures from regions like Sabah and Sarawak, which have distinct culinary identities, necessitating different spatial designs to accommodate diverse foodways. This study offers valuable insights for urban policy development by providing practical recommendations for inclusive community dining spaces that promote local food cultures and enhance the well-being of inner-city residents in Malaysia.

Keywords: Food Culture, Community Dining Space, Sustainable Design, Malaysia Food Heritage, Malaysia Foodways.

INTRODUCTION

According to the UNESCO Substantial City Development 2050 report, food culture plays a crucial role in the cultural identity of individuals and communities at both local and global levels. It serves as a powerful tool for promoting intercultural dialogue, social inclusion, and sustainable development (UNESCO, 2019). Food holds immense significance in bringing Malaysians together and facilitating the learning of each other's cultures and traditions. However, it can also become a source of contestation and ethnic tensions (Perry, 2017). Rapid urbanization has presented numerous challenges for cities today. Globalization has contributed to a sense of detachment from the local environment, as sites across Malaysia and elsewhere seem to resemble one another in appearance, smell, and sound (Cresswell, 2004). The process of economic and cultural redevelopment, aimed at attracting wealthier residents, often prioritizes individual tastes for maximum profitability. Unfortunately, this approach may lead to a lack of inclusivity in accessing local food for all communities. As food plays a vital role in culture and community development, the gentrification of globalization can result in cultural appropriation and social divisions, posing a destructive force in rapidly changing communities. This, in turn, contributes to food inequality in cities and threatens their long-term sustainability (Ramirez, 2021).

Rapid change and globalization are the norm in many parts of the Malaysian capital. As developer has Rapid change and globalization have become the norm in many parts of the Malaysian capital. Unfortunately, the closure of two hawker centers in Kuala Lumpur by developers has had a detrimental impact on the poor and middle-class communities, causing them to lose their

communal spaces (South China Morning Post, 2017). Despite the immense popularity of hawker centers and street food vendors among the public, the authorities (DBKL) do not always hold them in the same regard (South China Morning Post, 2017). Moreover, with rapid urbanization and an influx of foreigners, Petaling Street in Chinatown has gradually lost its cultural identity. Traditional businesses have been replaced by hipster cafes and bars, resulting in the loss of local communal spaces and displacement of inner-city inhabitants (The Edge Market, 2019). It can be argued that urbanization is taking place without considering food accessibility and inclusivity for local and inner-city communities. There is a need for planning that ensures equitable access to communal dining spaces, meeting the daily needs of all communities and promoting sustainable development.

Many scholars argue that the foodways of various ethnic groups in multiracial countries play a significant role in shaping the country's food identity (Noriza et al., 2012). Food is an integral part of our sense of identity in Malaysia. The ways in which different human groups eat help assert their diversity, hierarchy, and organization, as well as their oneness and the distinctiveness of those who eat differently (Fischler, 1988). Food patterns also serve as a means for people to connect with their cultural or ethnic groups and retain their cultural identity. Food preferences are influenced by the areas where families live and their ancestral origins, leading to distinct patterns of food choices within cultural or regional groups (Narayan, 1995). Food culture, as a non-material culture with authenticity, must be protected to achieve the sustainable development of translocal heritage and food culture (Zeng et al., 2014). Unfortunately, most hipster bars and restaurants have failed to preserve the identity and cultural significance in Malaysia, and they do not serve as communal dining places for all communities in Kuala Lumpur (Hairon, Zahari, Akbarruddin, & Majid, 2017). However, as an essential component of human development and a source of identity, food culture can provide sustainable solutions to local challenges. Currently, there is a lack of investigation into architectural space studies that explore the relationship between food culture and the sense of identity, which would contribute to the well-being of communities in Malaysian cities.

The research findings demonstrate that urbanization is often planned without considering food accessibility and inclusivity for local and inner-city communities as integral community spaces. Consequently, there is a critical need to prioritize the planning of community dining spaces that equally cater to the daily needs and social interactions of all communities, fostering better sustainable development. Furthermore, food culture plays a vital role in human development and serves as a source of identity. It offers sustainable solutions to local challenges. Therefore, it is imperative to investigate the relationship between food culture, a sense of identity, and the built environment through architecture space studies, aiming to create well-being communities in Malaysia.

For this dissertation, the selected city in Malaysia will be Bukit Bintang. Historically, Bukit Bintang was a vibrant area renowned for its diverse cultural attractions, such as theaters, exhibitions, cabarets, and the famous BB Park, featuring local food stalls. However, as Bukit Bintang underwent westernization, it became disconnected from the preferences of the local community. Consequently, many local residents relocated, resulting in an influx of immigrants and a loss of authenticity, particularly in Jalan Alor. Moreover, due to urban development and changing consumer preferences, several establishments have closed down or relocated over the years. As a consequence, Bukit Bintang has experienced a decline in its original charm and identity. Therefore, Bukit Bintang will serve as a case study to explore the factors that contribute to a robust food culture through community dining spaces, creating a better dining experience and fostering a sense of neighborhood community among local communities in Kuala Lumpur.

METHOD

This study will employ a quantitative survey method to collect data. The study population will focus on exploring multiple case studies and delving deeply into the approaches taken for community dining spaces with different cultural backgrounds, examining how they are transformed into spaces for social engagement and sustainable development in Bukit Bintang.

To gather perspectives, the study will survey 50 individuals residing in Kuala Lumpur who frequently dine in the selected case study locations. A set of questionnaires will be distributed online using a platform like Google Forms to collect the data. The survey questionnaire aims to capture the opinions of eaters and understand the factors that contribute to a robust food culture in the selected community dining spaces in Bukit Bintang. The survey findings will be instrumental in formulating guidelines for integrating a sense of community with a strong Malaysian food identity in dining spaces, creating neighborhood community spaces in Bukit Bintang.

The questionnaire will be divided into three parts. The first part will gather data on respondent demographics and backgrounds. The second part will collect data on public perceptions of community dining spaces and the factors influencing the development of a strong food culture identity in Malaysia's dining spaces.

The third part will collect data on the factors influencing communal dining spaces that have a strong food culture identity in Kuala Lumpur, with the aim of enhancing their sustainability. This information will assist in developing comprehensive design guidelines that address the needs and preferences of Malaysia's future community dining spaces. The questionnaire will gather data on the public's knowledge of sustainable traditional food culture, their responses to and acceptance of the application of a sense of community through food culture and dining space design.

The collected data will be analyzed using Microsoft Excel to identify the most frequently preferred facilities, amenities, and lifestyles for future community dining spaces, with an emphasis on enhancing their cultural sustainability.

The research will utilize a case study approach, selecting existing community dining spaces that serve recognized Malaysian heritage food and cater to the dining needs of the Bukit Bintang community. The criteria for selection will include the following:

- Representation of the three main cultures in Kuala Lumpur
- Recognition by a majority of Kuala Lumpur residents
- Offering of Malaysian heritage food

By conducting this research based on literature review findings and examining existing community dining spaces, the study aims to uncover insights and characteristics that contribute to the creation of vibrant community dining spaces that promote a strong food culture identity in Bukit Bintang.

RESULT

Understanding of Communal Dining Space with a Sense of Community. This section aims to assess respondents' understanding of communal dining spaces and their perception of a sense of community within these spaces.

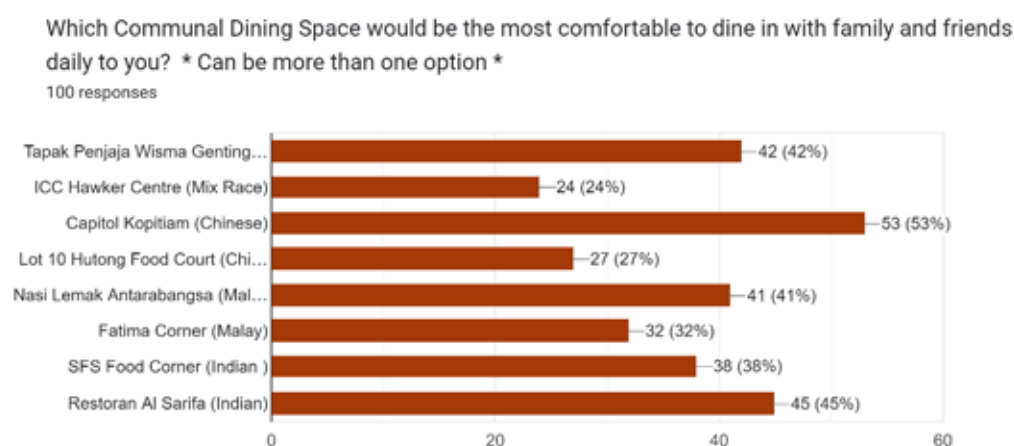


Figure.1 Respondents' preference for the most common dining space during normal times.

Source: The Author of this Article

The results indicate that the respondents' most common dining spaces during normal times varied. The highest number of responses were for Capitol Kopitiam (Chinese) with 49 respondents, followed closely by Tapak Penjaja Wisma Genting (Mix Race) with 50 respondents. Other dining spaces such as ICC Hawker Centre, Lot 10 Hutong Food Court, Nasi Lemak Antarabangsa, Fatima Corner, SFS Food Corner, and Restoran Al Sarifa also received significant responses ranging from 36 to 48 respondents.

Do you agree that table and seating arrangement influence your dining choices?

100 responses

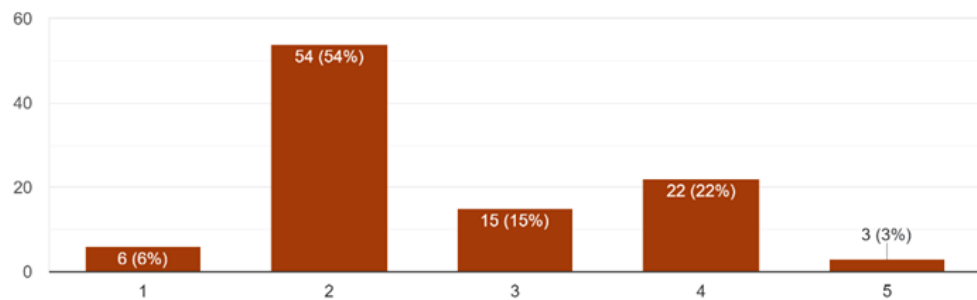


Figure.2 Influence of table and seating arrangement on dining choices.

Source: The Author of this Article

The respondents were asked to rate their agreement on a scale of 1 to 5, where 1 represents the highest agreement and 5 represents the highest disagreement. The majority of respondents (54%) chose rating 2, indicating that they agree that table and seating arrangement influence their dining choices. Ratings 3 and 4 received moderate agreement from 15% and 22% of the respondents, respectively. Only a small percentage (6%) chose rating 1, indicating the highest agreement, while 3% chose rating 5, indicating the highest disagreement.

Does digital technology influence your choice of dining?

100 responses

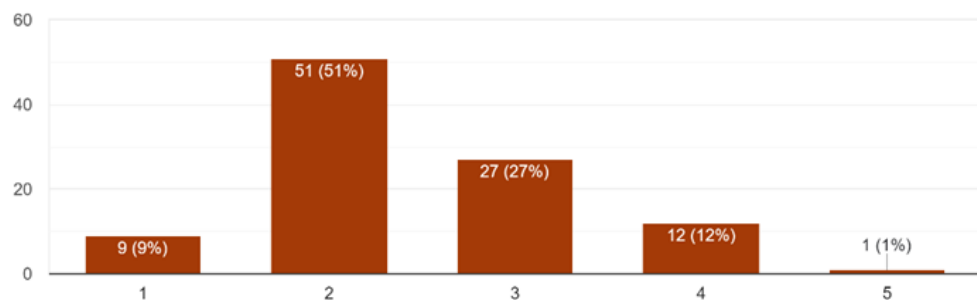


Figure.3 Impact of digital technology on dining choices.

Source: The Author of this Article

The respondents were asked to rate their agreement on a scale of 1 to 5, where 1 represents the highest agreement and 5 represents the highest disagreement. The results show that digital technology does influence the choice of dining for the majority of respondents. The highest percentage of respondents (51%) chose rating 2, indicating agreement. Ratings 3 and 4 received moderate agreement from 27% and 12% of the respondents, respectively. Only a small percentage (9%) chose rating 1, indicating the highest agreement, while 1% chose rating 5, indicating the highest disagreement.

What factors influence your comfort perception when dining in a group, including table and seating, lighting, and decoration?

100 responses

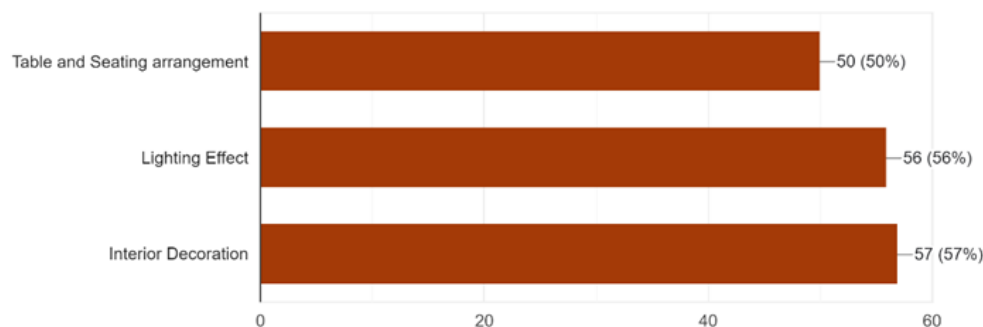


Figure.4 Factors influencing respondents' comfort perception, including table and seating, lighting, and decoration.

Source: The Author of this Article

The respondents were asked to select the factors that influence their comfort perception when dining in a group. The results show that table and seating arrangement (50%), lighting effect (56%), and interior decoration (57%) were considered important factors influencing their comfort perception.

Which of the following requirement should make you feel comfortable dining in? * Can be more than one option *

100 responses

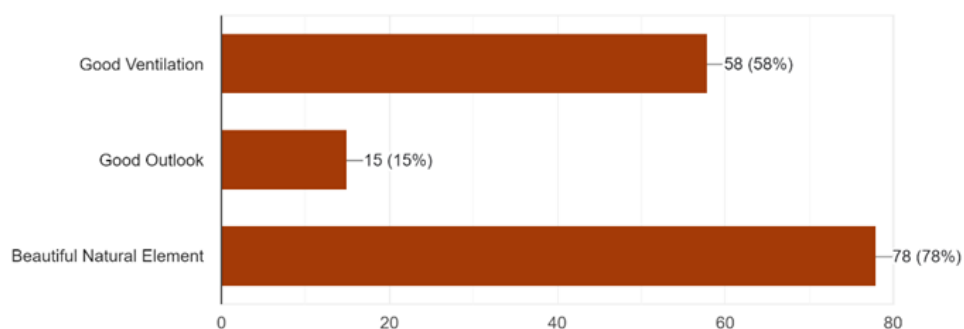


Figure.5 Respondent agreement's the factors that contribute to their comfort while dining.

Source: The Author of this Article

The respondents were asked to select the requirements that would make them feel comfortable when dining. The results indicate that the majority of respondents (78%) considered beautiful natural elements as a requirement for their comfort. Good ventilation (58%) was also considered important, while a good outlook (15%) received a relatively lower percentage of responses.

What types of community involvement spaces do you think should be included in the communal dining space in the city? * Can be more than one option *

100 responses

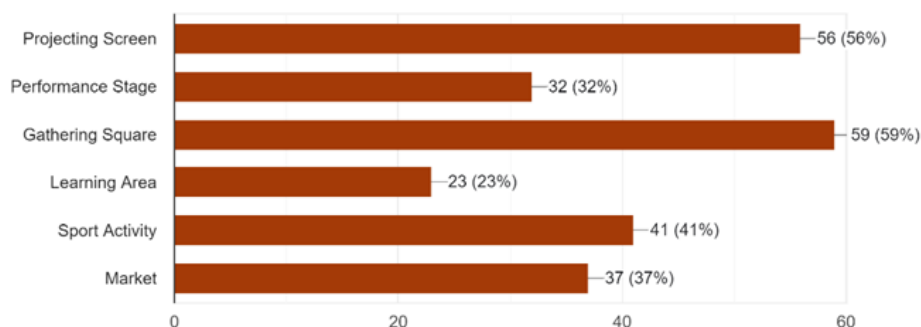


Figure.6 Preferences for activities to be included in the communal dining space in the city.

Source: The Author of this Article

The respondents were asked to select the types of community involvement spaces they think should be included in the communal dining space. The results show that projecting screen (59%), gathering square (59%), and sport activity (41%) were considered important community involvement spaces. Other options such as performance stage (32%) and market (37%) also received significant responses. The majority of respondents (99%) indicated that their answers were related to their opinion about local events and the context of Bukit Bintang. Only a small percentage (1%) provided other reasons based on the program given.

Do you agree communal dining space is one of the community space for the public?

100 responses

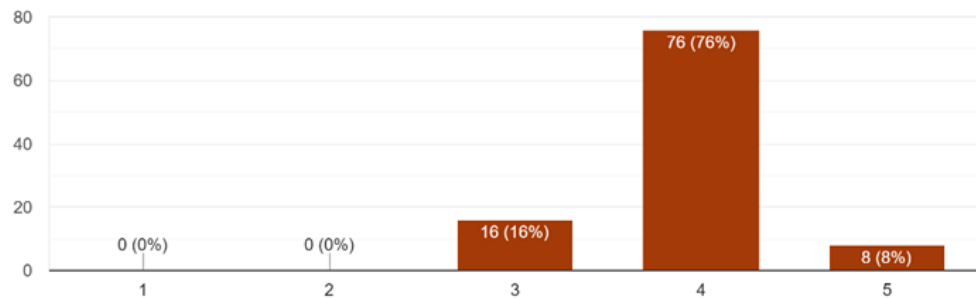


Figure.7 Respondent agreement on communal dining spaces as part of public community spaces.

Source: The Author of this Article

The respondents were asked to rate their agreement on a scale of 1 to 5, where 1 represents the highest agreement and 5 represents the highest disagreement. The results show that the majority of respondents (76%) chose rating 4, indicating their agreement that communal dining space is one of the community spaces for the public. Ratings 3 and 5 received moderate agreement from 16% and 8% of the respondents, respectively, while no respondents chose rating 1 or 2.

Which natural environment aspect should you have to make you feel comfortable dining in? * Can be more than one option *

100 responses

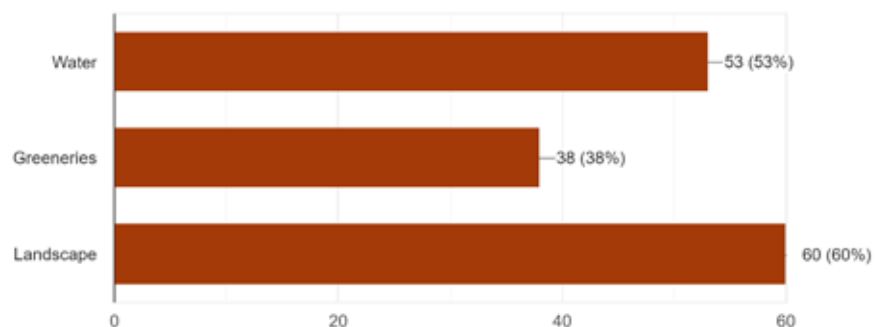


Figure.8 Importance of specific natural environment aspects in creating a comfortable dining atmosphere.

Source: The Author of this Article

The respondents were asked to select the natural environment aspects that would make them feel comfortable when dining. The results indicate that landscape (60%) received the highest percentage of responses, indicating its importance for comfort. Water (53%) and greenery (38%) were also considered significant natural environment aspects for dining comfort.

This section of the study focuses on the investigation and analysis of the intricate relationship between food cultural identity and architectural space. It delves into understanding how these two elements intertwine and influence each other within the context of community dining spaces.

What kind of Malaysian culture do you usually see in Bukit Bintang, Kuala Lumpur? * Can be more than one option *

100 responses

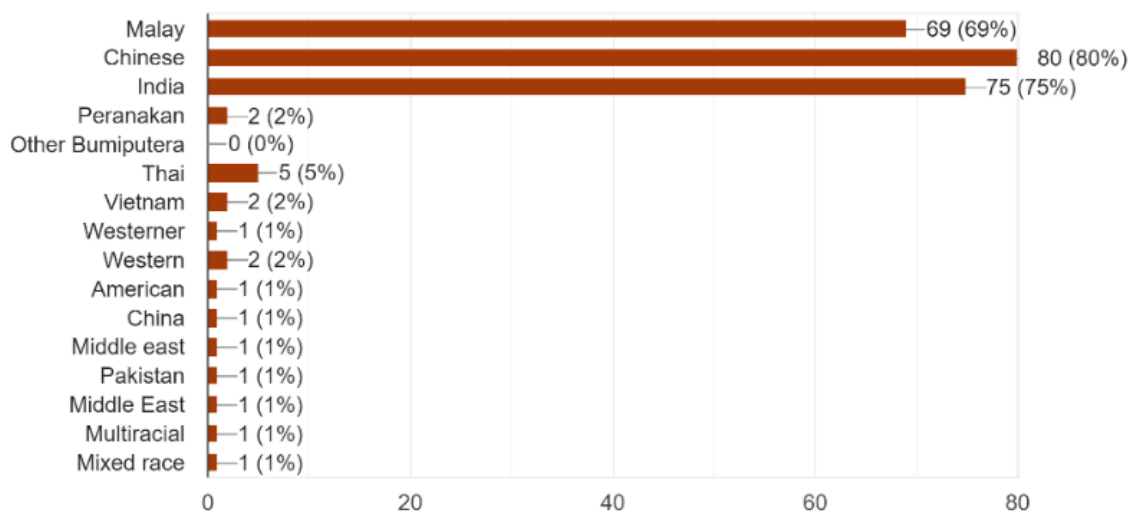


Figure.9 Observations of Malaysian cultural elements in Bukit Bintang, Kuala Lumpur.

Source: The Author of this Article

The respondents reported the presence of multiple cultures in Bukit Bintang, Kuala Lumpur. The majority identified Malay (69%), Chinese (80%), and Indian (75%) cultures as commonly seen. Other cultures mentioned include Thai, Vietnamese, Western, Chinese, Middle Eastern, and Pakistan.

What are the following characteristics of eating or cooking habits are representative of Malay culture? * Can be more than one option *

99 responses

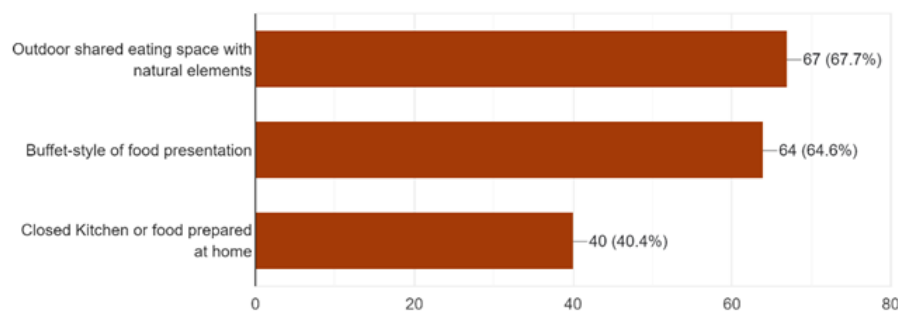


Figure.10 Identifying characteristics of eating or cooking habits that represent Malay culture.

Source: The Author of this Article

What are the following characteristics of eating or cooking habits are representative of Chinese culture? * Can be more than one option *

99 responses

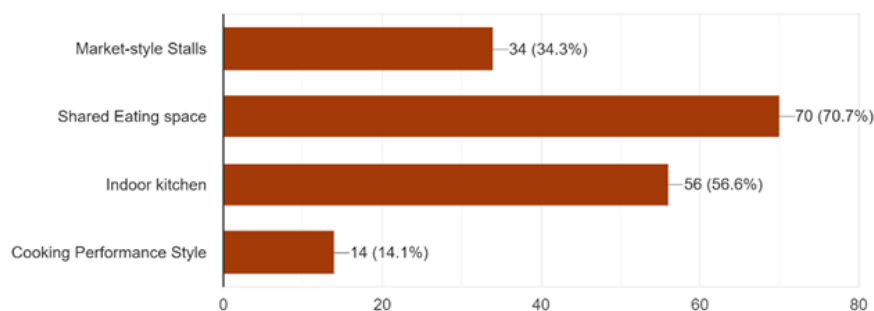


Figure.11 Identifying characteristics of eating or cooking habits that represent Chinese culture.

Source: The Author of this Article

What are the following characteristics of eating or cooking habits are representative of India culture? * Can be more than one option *

99 responses

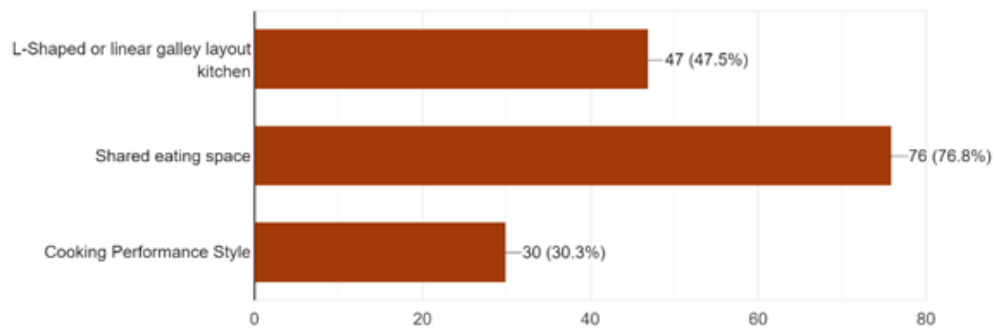


Figure.12 Identifying characteristics of eating or cooking habits that represent Indian culture.
Source: The Author of this Article

Based on the responses, the characteristics of eating or cooking habits representative of Malay culture include the preference for outdoor shared eating spaces with natural elements (67%), buffet-style food presentation (64%), and a tendency for closed kitchens or food prepared at home (40%).For Chinese culture, the identified characteristics include the presence of market-style stalls (34%), shared eating spaces (70%), indoor kitchens (56%), and occasional cooking performance styles (14%). Regarding Indian culture, the characteristics consist of a preference for L-shaped or linear galley layout kitchens (47.5%), shared eating spaces (76.8%), and a tendency for cooking performance styles (30.3%).

Do you agree that the selected cultural characteristics represent Malaysian food culture in Kuala Lumpur?

99 responses

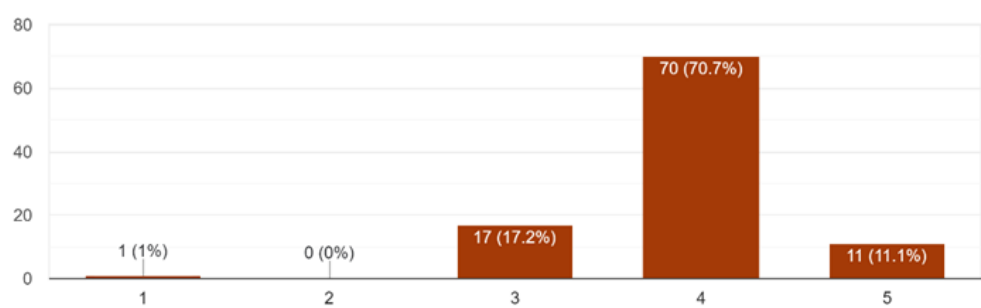


Figure.13 Agreement on selected cultural characteristics representing Malaysian food culture in Kuala Lumpur.
Source: The Author of this Article

Do you agree that community involvement and cultural activities reflect Malaysia's identity?

98 responses

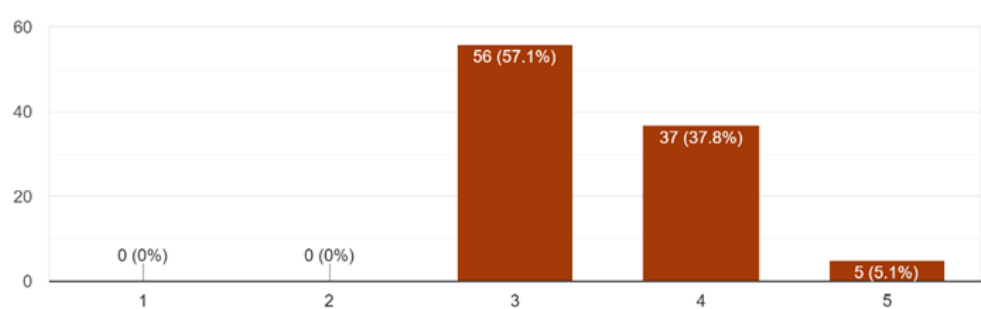


Figure.14 Agreement on selected cultural characteristics representing Malaysian food culture in Kuala Lumpur.
Source: The Author of this Article

Regarding the agreement on cultural characteristics and representation, the majority of respondents agreed that the selected cultural characteristics represent Malaysian food culture in Kuala Lumpur. However, the level of agreement varied across the different questions, with ratings ranging from 1 to 5.

What is the following physical element in communal dining space could reflect its cultural identity? *

Could be more than one *

100 responses

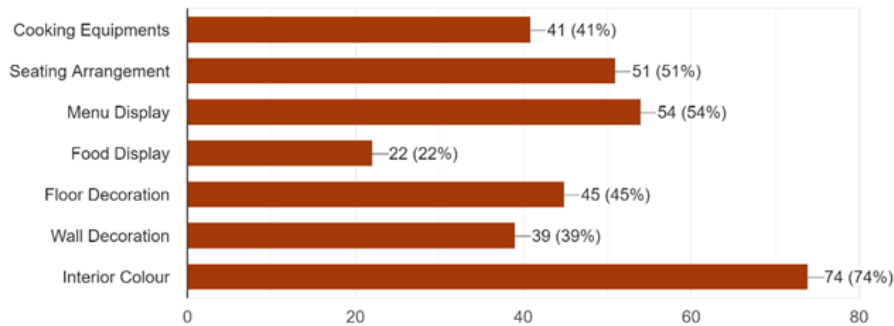


Figure.15 Identifying physical elements in communal dining spaces that reflect cultural identity.

Source: The Author of this Article

According to the respondents, seating arrangement (51%), menu display (54%), interior color (74%), and floor decoration (45%) were identified as physical elements that could reflect cultural identity.

Do you agree that kitchen space arrangements from different food cultures can represent their identity?

98 responses

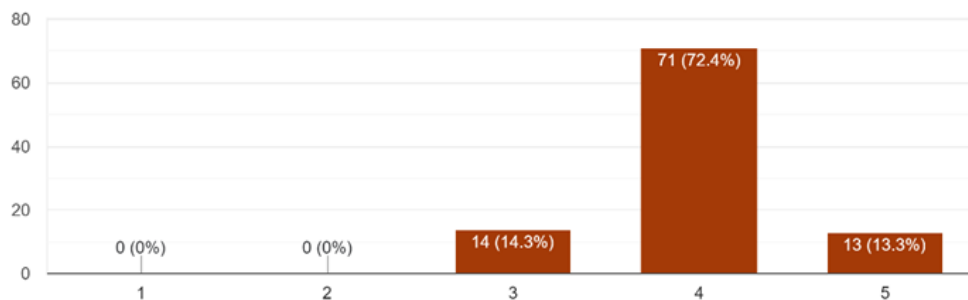


Figure.16 Agreement on kitchen space arrangements representing cultural identity

Source: The Author of this Article

The majority of respondents (72.4%) agreed that kitchen space arrangements from different food cultures can represent their cultural identity.

DICUSSION

The previous chapters have presented the research methodology and the results of the survey questionnaire, focusing on understanding the perception and preferences of respondents regarding communal dining spaces with a sense of community in Bukit Bintang, Kuala Lumpur. In this chapter, the findings will be discussed and analyzed in relation to the research objectives, providing insights into the factors that contribute to the creation of vibrant community dining spaces and the integration of food cultural identity with architectural space. The discussion will also explore the implications of the findings for architectural design strategies and the promotion of sustainable community dining spaces.

Understanding of Communal Dining Spaces and Sense of Community

The survey findings indicate that respondents have a good understanding of communal dining spaces and recognize their role in fostering a sense of community. The majority of respondents preferred dining spaces such as Capitol Kopitiam and Tapak Penjaja Wisma Genting, highlighting their popularity among the community. The agreement on the influence of table and seating arrangements on dining choices suggests that the physical layout of communal dining spaces significantly impacts the comfort and preference of individuals.

The preference for smaller seating arrangements when dining alone and medium-sized groups when dining with family and friends reflects the social nature of communal dining. The flexibility to adjust seating arrangements to accommodate larger groups was also acknowledged as facilitating comfortable dining experiences. This finding emphasizes the importance of providing flexible and adaptable seating arrangements in community dining spaces to cater to different group sizes and promote inclusivity.

The influence of digital technology on dining choices indicates the growing impact of technology in shaping individuals' preferences and behaviors. Community dining spaces need to consider integrating digital elements that enhance accessibility, convenience, and engagement for visitors. This can include features such as digital menus, online reservations, and interactive displays that showcase community events and cultural activities.

The findings also highlight the significance of factors beyond the dining space itself in influencing respondents' choices, such as the availability of local food establishments and the cleanliness of the dining spaces. These factors should be considered when designing and managing community dining spaces, as they contribute to the overall dining experience and satisfaction of individuals.

Integration of Food Cultural Identity and Architectural Space

The survey findings reveal that respondents recognize the influence of food cultural identity on communal dining spaces. The presence of multiple cultures in Bukit Bintang, including Malay, Chinese, and Indian, reflects the diverse culinary traditions and eating habits within the community. Respondents identified specific characteristics of each culture's eating and cooking habits, such as the preference for outdoor shared eating spaces with natural elements in Malay culture and market-style stalls in Chinese culture.

The agreement on the representation of cultural characteristics in communal dining spaces suggests that individuals value the incorporation of cultural elements that reflect their food traditions and heritage. Factors such as cooking methods, eating habits, dining space layout, and food displays were considered important in reflecting cultural identity. These findings highlight the need for architects and designers to create spaces that celebrate and embrace the unique food cultural identities of the community.

Respondents expressed a preference for communal dining spaces that incorporate natural elements, good ventilation, and attractive landscape features. This aligns with the concept of biophilic design, which emphasizes the connection between humans and nature in the built environment. Integrating natural elements, such as greenery, water features, and outdoor seating areas, can enhance the dining experience and create a sense of harmony with the surrounding environment.

The agreement on the significance of kitchen space arrangements in representing cultural identity suggests that the visibility of cooking activities and the design of kitchen spaces play a crucial role in creating a strong food cultural identity. Open kitchens, cooking performance styles, and specific kitchen layouts were identified as elements that reflect cultural traditions and contribute to the overall dining experience.

Implications for Architectural Design Strategies

The findings from the survey questionnaire provide valuable insights for developing architectural design strategies that promote vibrant community dining spaces with a strong sense of community and food cultural identity. Based on the discussion of the results, the following implications and recommendations can be made:

Flexibility and adaptability: Community dining spaces should be designed to accommodate different group sizes and promote social interaction. Providing flexible seating arrangements that can be easily adjusted based on the number of diners will enhance inclusivity and the overall dining experience.

Integration of technology: Incorporating digital elements in communal dining spaces can enhance accessibility and engagement. Features such as digital menus, interactive displays, and online platforms for reservations and community event information should be considered to meet the expectations of modern visitors.

Cultural representation: Architectural design should celebrate and reflect the food cultural identity of the community. This can be achieved through the incorporation of cultural elements in the physical space, such as seating arrangements, menu displays, interior colors, and floor decorations. Open kitchens and cooking performance spaces can also provide opportunities for showcasing cultural traditions.

Biophilic design: Integrating natural elements and creating connections with the surrounding environment can enhance the dining experience. Incorporating greenery, water features, and outdoor seating areas will contribute to a sense of tranquility and harmony with nature.

Community involvement spaces: Community dining spaces should be designed to encourage community involvement and cultural activities. Providing spaces for projecting screens, gathering squares, performances, and markets will foster community engagement and create opportunities for social interaction.

Sustainable practices: Designing community dining spaces with sustainability in mind is crucial. This includes considering the use of local raw materials, promoting local agriculture, and incorporating energy-efficient and environmentally friendly design strategies.

Accessibility and inclusivity: Community dining spaces should be designed to be accessible and inclusive for all individuals, regardless of age, physical ability, or cultural background. Incorporating universal design principles and ensuring barrier-free access will enhance the inclusiveness of the spaces.

Collaboration and stakeholder engagement: Architects and designers should collaborate with local communities, food vendors, and relevant stakeholders to ensure that the design of community dining spaces aligns with the needs and aspirations of the community. Engaging stakeholders in the design process will foster a sense of ownership and increase the chances of successful implementation.

CONCLUSION

This dissertation aimed to explore the integration of food cultural identity and architectural space in community dining spaces with a sense of community in Bukit Bintang, Kuala Lumpur. The research methodology involved a quantitative survey approach, collecting data from 50 respondents residing in Kuala Lumpur. The survey questionnaire investigated respondents' understanding and perception of communal dining spaces, as well as the influence of food cultural identity on architectural design.

The findings from the survey questionnaire provided valuable insights into respondents' preferences and perceptions. Respondents showed a good understanding of communal dining spaces and recognized their role in fostering a sense of community. The physical layout, including table and seating arrangements, was identified as influential in dining choices. The integration of digital technology, such as digital menus and online reservations, was also acknowledged as impacting dining preferences.

Respondents recognized the influence of food cultural identity on communal dining spaces. Specific characteristics of Malay, Chinese, and Indian cultures were identified, and the representation of these cultural elements in dining spaces was considered important. Factors such as cooking methods, eating habits, dining space layout, and food displays were seen as reflecting cultural identity.

The preferences for natural elements, good ventilation, and attractive landscape features in communal dining spaces were also highlighted. Respondents expressed a desire for spaces that create a sense of harmony with nature, aligning with the concept of biophilic design.

Based on the findings, several implications and recommendations can be made for architectural design strategies that promote vibrant community dining spaces with a strong sense of community and food cultural identity. These include:

- Designing flexible and adaptable spaces to accommodate different group sizes and promote social interaction.
- Integrating digital elements to enhance accessibility, convenience, and engagement for visitors.
- Celebrating and reflecting the food cultural identity of the community through the incorporation of cultural elements in the physical space.
- Incorporating biophilic design principles to create a connection with nature and enhance the dining experience.
- Providing spaces for community involvement and cultural activities to foster community engagement and social interaction.
- Designing with sustainable practices in mind, considering the use of local materials and energy-efficient strategies.
- Ensuring accessibility and inclusivity for all individuals by incorporating universal design principles and barrier-free access.
- Collaborating with local communities and stakeholders to ensure the design aligns with their needs and aspirations.

While this dissertation provides valuable insights into the integration of food cultural identity and architectural space in community dining spaces, it is essential to acknowledge the limitations of the study. The research was conducted in Bukit Bintang, Kuala Lumpur, with a relatively small sample size of 50 respondents. The findings may not be representative of the entire population, and the specific cultural context of Bukit Bintang should be considered when generalizing the results.

Future research could expand the scope of the study to include a larger sample size and investigate other geographical locations. Comparative studies between different cultural contexts could provide further insights into the influence of food cultural identity on communal dining spaces. Additionally, qualitative research methods, such as interviews and observations, could provide more in-depth understanding of individuals' experiences and behaviors in community dining spaces.

In conclusion, this dissertation contributes to the understanding of the factors that contribute to vibrant community dining spaces with a strong sense of community and food cultural identity. The findings provide valuable insights for architects, designers, and stakeholders involved in the planning and design of community dining spaces. By creating inclusive, culturally representative, and sustainable dining environments, these spaces can foster social interaction, celebrate cultural heritage, and enhance the overall well-being of the community.

ACKNOWLEDGEMENT

The author would like to express sincere and special gratitude to advisor Dr Wan Srihani Wan Mohamed and the surveys' participants for their invaluable participation and insightful feedback in this study.

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