

SOCIO-CULTURAL RESILIENCE FRAMEWORK FOR THE SUSTAINABILITY OF THE SEA TRIBES COMMUNITY OF THE INSULAR CITY

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ABSTRACT

Since 2000, industrial development in Batam, Indonesia, has led to urbanization and limited land, which has expanded to coastal settlements and threatened the community's social and cultural values. This problem needs to be addressed by the government efficiently and inclusively to ensure sustainable development that preserves local identity. This study formulated a socio-cultural resilience framework for Batam's local sustainability identity. The research used mixed methods, including a questionnaire among the Suku Laut aged 21-60 years, field observations, and expert interviews. This study used LSR, SPSS, AHP, and City Resilience Framework theory. Three indicators defined the socio-cultural resilience framework: people (human and employment), organizations (economy and society), and knowledge (education). The contribution of this study to the government's sustainable planning and management considerations includes the development of affordable and culturally appropriate housing, the creation of livelihood opportunities, the building of public trust, and the implementation of education strategies that address the needs of the Suku Laut community. The research has a far-reaching positive impact across diverse sectors, benefiting the Suku Laut community and the broader stakeholders involved in Batam's development and cultural preservation, urban planning, policymaking, community empowerment, academic discourse, and cultural heritage conservation.

1. INTRODUCTION

Industrialization was essential for economic growth (Frenken et al., 2007) and has brought economic prosperity, poverty reduction, generated income and employment and facilitated international trade. Conversely, industrialization results in overpopulation, urbanization, increased gas emissions, climate change, pollution, changes in land use, decreased health, and environmental degradation (Kniiivila, 2006; Hossain, 2011; Szirmai & Verspagen, 2015; UNIDO, 2015; Ismail, 2017; Patnaik, 2018; Sarkodie et al., 2020; Yong, 2021; Kasikoen et al., 2022).

Industrial processes play a significant role in urbanization, stimulating urbanization (Wijaya et al., 2018). The reason for urbanization was that immigrants from the countryside seek better opportunities for themselves and their families (Kanbur & Venables, 2007; Wijaya et al., 2018). City development as a center of economic activity attracts immigrants to come to the city in search of job opportunities;

people from areas with fewer facilities would go to areas with better development facilities (Ravenstein, 1885; Dickie & Gerking, 1998; Nahuis & Parikh, 2002; Hidayati, 2018).

The United Nations General Assembly set the Sustainable Development Goals (Pradhan et al., 2017). Goal 11 explicitly aims to make cities and human settlements inclusive, safe, resilient, and sustainable. Target 11.3 enhances inclusive and sustainable urbanization and and sustainable human settlement planning and management in all countries. Building a safe, resilient, and sustainable city requires maintaining positive economic, social, and environmental links between urban, peri-urban, and rural areas, strengthening national and regional planning, and safeguarding and protecting the world's cultural and natural heritage (Harahap, 2013; Almaaroufi et al., 2019).

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The significant problems faced in Indonesia regarding protecting the social and cultural heritage are increasing population density and urban environmental demands, causing changes in land use to provide housing needs and other urban facilities. Limited land has led to the expansion of development to suburban areas such as traditional coastal settlements, which have inherited historical, social, and cultural values that can threaten the loss of social and cultural values (Wagistina & Antariksa, 2019).

Geographically, Indonesia is a maritime country dotted with islands; of the 67,439 villages in Indonesia, approximately 9,261 villages are categorized as coastal villages or traditional coastal settlements (Trisniawati, 2015; Kusnadi, 2009). Batam City, Indonesia, consists of 329 inhabited islands, with one large island and the center of urban growth, namely Batam Island, as the mainland.

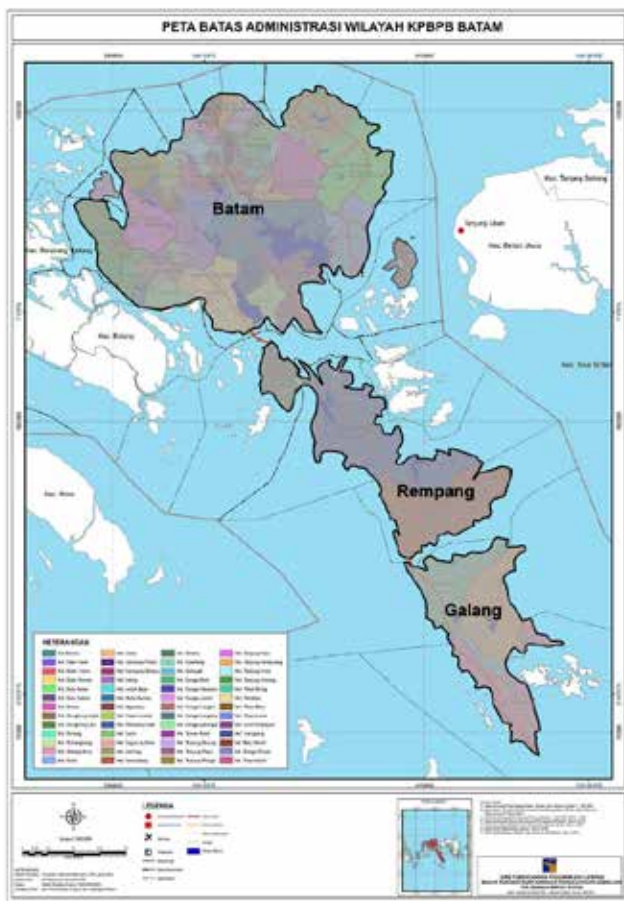


Figure 1: Map of islands in Batam City (adapted from BP Batam, 2020)

Batam Island was designated the city as the first industrial area in Indonesia based on Presidential Decree No. 74 of 1971. Batam as the melting pot of economic growth in the western part of Indonesia, being on the international sea trade route and dealing with developed countries such as Singapore and Malaysia. Industrial developments attracted many immigrants to work and settle in Batam. Therefore, in 2000, there was an explosion in the population of Batam City with

an increase of 3.36%. In line with the rapid population growth, there has been an increase in development so that by 2020 the number of built-up areas in the center of Batam City has reached 97% (BPS, 2020). Hence, the development coming close to the suburban area, including the traditional coastal settlement, affected social and cultural changes in the local community of traditional coastal settlements.

The ethnicity that settled on Batam is namely Suku Laut or sea tribes, a representation of the maritime indigenous. This society has a maritime spirit with a tradition that makes the sea the basis for forming culture. Historically, they were sea nomads who depended on fishing, living on canoes with shade covers (*sampan berkajang*). This canoe also served as a boat dwelling, where the Suku Laut conducted their daily life and livelihood activities on the sea and only go ashore for necessary occasions such as collecting clean water, repairing canoes, and funeral (Satria, 2015; Sidiq, 2019).

Nowadays, Suku Laut settled at the coastal settlement near the suburban area known as Kampung Tua. On the mainland, Batam island Suku Laut lives in Kampung Tua Tiang Wangkang. Furthermore, the traditional coastal settlement of Suku Laut embraces the historical value of traditional Malay wooden houses built on stilts (Yulia, 2016; Hairudin & Sri Wahyuni, 2019), which is the cultural heritage of Batam City.

Industrial development impacts the transformation of social and cultural elements that threaten to lose the character and existence of Suku Laut's traditional coastal settlement. Social change is an inseparable part of society; these changes occur because of the stability of society to adapt to new needs and conditions that arise in line with the growth of society. In addition, it is also influenced by internal factors such as increasing community members and increasing open-minded and educated individuals (Soekanto, 1993; Soerjono, 2009; Martono, 2011; Kinseng, 2021).

The research problem addressed in this study revolves around the impact of industrialization and urbanization on the social and cultural heritage of the Suku Laut community in Batam, Indonesia. This rapid urban growth has led to the expansion of development, encroaching upon traditional coastal settlements, which hold historical, social, and cultural significance, posing a challenge in maintaining the social and cultural heritage of the Suku Laut community. The focal point of this study delves into the social changes triggered by industrialization and urbanization, particularly in how they affect the social norms, behaviors, and interactions within the Suku Laut community—understanding these changes crucial for formulating effective urban planning strategies that safeguard the social and cultural values of traditional coastal settlements. The results of this research formulated the socio-cultural resilience framework for the sustainability of the insular city's Suku Laut community, to filled the gap between traditional coastal settlement preservation, and to support government spatial plan regulations (RTRW) in urban planning of Batam in the next twenty years.

2. METHOD

This research was a mixed method combining qualitative and quantitative methods. The qualitative descriptive method was chosen to describe and analyze phenomena at research sites in natural conditions, understand human or social phenomena, and obtain comprehensive data. A quantitative method for measuring the existence of a variable. The research data collection was through observation, interview, and questionnaire for primary data, and documentation for secondary data.

The study involved random sampling of the community’s population based on the characteristics of citizens who have lived there for at least a decade. This research was conducted on 174 people living in a traditional coastal settlement on mainland Batam, who has the original bloodline of Suku Laut and are productive aged 21-60. Determination of the number of sample populations using the Slovin formula: $n = \frac{N}{N(d)^2 + 1}$ (n = sample; N = population; d = 95% precision value or $sig. = 0.05$).

The questionnaires used Likert’s Summated Rating (LSR) and SPSS software. All data collected would be verified using the Analytical Hierarchy Process (AHP) analysis to obtain verified data. Furthermore, the researcher described the overall analysis as the final result of this study. In contrast, AHP was used in this study to analyze the opinions of nine (9) professionals or experts on the social dan cultural changes that occur at traditional coastal settlements. The expected results of this AHP as the basis for designing the socio-cultural resilience framework combined with the resilience framework (CRF) theory by the Rockefeller Foundation and ARUP. The flowchart of this research methodology can be seen in Figure 2 below.

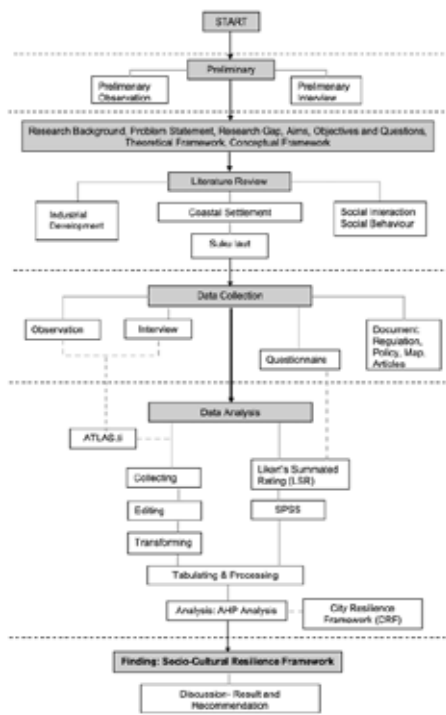


Figure 2: Research Methodology Flow Chart

3. RESULTS AND DISCUSSION

3.1 Social Interaction Changes Analysis

In order to find changes in social interaction, observations took place on the Suku Laut community at the study site, Tiangwangkang traditional coastal settlement, Batam mainland. In order to obtain a comprehensive picture of changes in social interactions and behavior in the Suku Laut community during the mornings, afternoons, evenings, and nights, observations were conducted for a week from Sunday to Saturday. These observations were performed in order to determine changes in social interaction. Research related to social interaction also took place using questionnaires of 20 questions given to 174 respondents to find some changes in the social interaction of the Suku Laut in Tiang Wangkang traditional coastal settlement, Batam mainland. The result of social interaction change is shown in table 1 below.

Table 1: Social Interaction Change

Parameters	Past	Changes	Criteria
Life	Protective and closed social life	Open and widely socialized, the community has a strong sense of belonging	Trust others; respect others; love meeting
Belief	Religion is not practiced, only within the nuclear family or among individuals	The whole community participates in religious activities	Religious interaction
Family	Families that are nuclear (<i>Batih families</i>)	Interaction of family members with other groups	Trust others; sense of empathy
House	Traditionally, nomads live in 'sampan berkajang' (canoes)	Inhabitants of a settlement	Modern life; educated; togetherness
Knowledge	Barter transactions do not recognize currency as a form of payment	Knowledgeable of the currency, educated	Educated

Table 1 above demonstrated that Suku Laut, who used to live far from the outside world and only communicated with their family groups, now like togetherness and helping each other and values mutual respect and solidarity among their settlement neighbors. Suku Laut communities have social interactions that turn out to be more open to others and solidarity with others. Suku Laut experienced changes in social interaction with the classification results into five (5) parameters, including life, belief, family, livelihoods, house, and knowledge, and 15 criteria as indicators of social interaction changes. The changes that occur was in a positive direction. Nevertheless, the Suku Laut was slowly losing their identity and character by no longer preserving their *sampan berkajang*, cultural value and historical identity. The younger generation needs more expertise to make *sampan berkajang*, a cultural and historical heritage important to the Suku Laut. Instead, they live in wooden houses in settlements and fish with modern motorized boats.

3.2 Social Behavior Changes Analysis

Suku Laut's social behavior was also investigated through observation and questionnaire distribution, as was done in research on changes in social interaction. A change in behavior result from observational data and questionnaires was shown in the following table 2 below.

Table 2: Social behavior change

Parameters	Past	Changes	Criteria
Life	A nomadic life	A sedentary life	Sedentary housing; trust others; togetherness
Belief	Belief in animism	Beliefs in religion	Has religion
Family	A 'sampan' is prepared by parents for their married children	Children are taught to have an independent work ethic by their parents	Independence; responsibility; courage; sense of empathy
Married	Maintain group authenticity/distinctness by marrying cousins	Modern marriage, open-mindedness, freedom	Modern marriage; is open-minded; accepts differences
Livelihoods	Visit a mangrove swamp to catch crabs or fish in the sea	A diverse range of livelihoods	Independence; responsibility; courage
House	West-facing houses are less fortunate (dead sun)	House built in a linear pattern	Modern life; educated; togetherness
Knowledge	Goods of traditional origin	Life in the modern age	Modern life; high standard of living

According to Table 2 above, Suku Laut experienced changes in social interaction, produced 7 (seven) parameters and 15 criteria as indicators of changes in social interaction. The Suku Laut experienced a change in their formerly nomadic dwellings in canoes to settle in a house with a linear settlement pattern following the path of the road and no longer understanding the direction of the house based on the rising and setting of the sun. The social life that is more open to outsiders no longer requires marrying cousins; they have also known religion and have modern lives and received an education. However, Suku Laut no longer maintains group authenticity or distinctiveness, with openness to accepting newcomers with modern culture, friendship, and marriage, causing the Suku Laut to lose its traditional culture. Changes in social interaction and behavior have the potential for changes in social and cultural (norms) changes. Combining and merging with an analysis of the criteria for changes in social interaction and behavior would produce 17 criteria related to social interaction and social behavior; AHP would then analyze these parameters to find social and cultural (norms) changes.

3.3 Social and Culture Parameters

In order to get the priority parameters of changes in social norms, an analysis of 17 criteria took place based on changes in social interaction and social behavior used Analytical Hierarchy Process

(AHP). Coding for each criterion is: 1 = trust other; 2 = respect other; 3 = accept differences; 4 = courage; 5 = independence; 6 = responsibility; 7 = open minded; 8 = sedentary housing; 9 = togetherness; 10 = sense of empathy; 11 = educated; 12 = modern life; 13 = modern marriage; 14 = has religion; 15 = love meeting; 16 = competition; 17 = high standard of living. The AHP process involved nine experts in formulated priority criteria that would be the basis for the formulation of social norms change.

The 17 criteria indicators produced 136 pairwise comparisons to calculate priorities using the Analytic Hierarchy Process with an AHP scale of 1-9, namely: 1-Equal importance, 3-Moderate importance, 5-Strong importance, 7-Very vital importance, 9-Extreme importance (2,4,6,8 values in-between). The result weights depend on the principal eigenvector of the decision matrix, as seen in figure 2 below, with principal eigenvalue (λ) = 17.990 and consistency ratio (CR) = 3.8% (0.038). The consistency ratio value is $-0.005 \leq 0.1$, meaning that the matrix is consistent.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	2.00
2	1.00	1	2.00	2.00	2.00	2.00	2.00	1.00	1.00	3.00	2.00	2.00	2.00	1.00	1.00	2.00	2.00
3	1.00	0.50	1	3.00	3.00	3.00	3.00	3.00	3.00	1.00	3.00	3.00	1.00	3.00	3.00	3.00	3.00
4	1.00	0.50	0.33	1	1.00	1.00	1.00	2.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	3.00
5	0.50	0.50	0.33	1.00	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
6	1.00	0.50	0.33	1.00	1.00	1	1.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00
7	1.00	0.50	0.33	1.00	1.00	1.00	1	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00
8	1.00	1.00	0.33	0.50	1.00	1.00	1.00	1	1.00	2.00	1.00	1.00	3.00	1.00	1.00	1.00	2.00
9	1.00	1.00	0.33	1.00	1.00	1.00	1.00	1.00	1	2.00	1.00	2.00	3.00	1.00	1.00	2.00	1.00
10	1.00	0.33	0.33	0.50	1.00	0.50	1.00	0.50	0.50	1	1.00	2.00	2.00	1.00	1.00	3.00	2.00
11	1.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1	2.00	3.00	1.00	1.00	1.00	1.00	3.00
12	0.50	0.50	0.33	0.50	1.00	0.50	1.00	0.50	0.50	0.50	1	1.00	1.00	1.00	1.00	1.00	1.00
13	0.50	0.50	0.33	0.33	1.00	0.50	0.50	0.33	0.33	0.50	0.33	1	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1	3.00	5.00	5.00	5.00
15	1.00	1.00	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	1	1.00	2.00	2.00
16	1.00	0.50	0.33	0.33	0.50	0.50	1.00	0.50	0.33	1.00	1.00	1.00	0.20	1.00	1	1.00	1.00
17	0.50	0.50	0.33	0.33	0.50	1.00	0.50	0.50	1.00	0.50	0.33	1.00	1.00	0.20	0.50	1.00	1

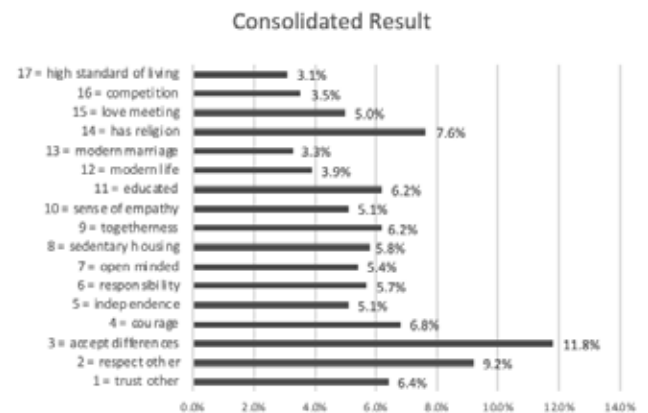


Figure 3: AHP result

A summary of the consolidated results of the resulting weights for criteria based on pairwise comparisons, which displayed the priority order of the results of the expert assessment used the AHP software, was presented in table 3 below.

Table 3: Social Norms AHP Result

No	Criteria	Priority
1	Accept differences	11.8%
2	Respect others	9.2%
3	Has religion	7.6%
4	Courage	6.8%
5	Trust others	6.4%
6	Educated	6.2%
7	Togetherness	6.2%
8	Sedentary housing	5.8%
9	Responsibility	5.7%
10	Open minded	5.4%
11	Sense of empathy	5.1%
12	Independence	5.1%
13	Love meeting	5.0%
14	Modern life	3.9%
15	Competition	3.5%
16	Modern marriage	3.3%
17	High standard of living	3.1%

Table 3 above shown the priority indicators of social interaction and behavioral change. The top priority score (11.8%) was accepting differences, whereas previously, Suku Laut lived closed, isolated, with their nuclear family and only gathered with their fellow. As long as Suku Laut was composed of the inner family or *batih family*, outsiders or strangers were not allowed in. The group maintains its integrity and authenticity (distinctiveness). The growth of mainland Batam as an industrial city and technological developments have led to changes in accepting differences and living more openly with others. High living standards (3.1%) were the lowest priority, despite Suku Laut's rapid growth and technological advances. It was far more critical to have a high education and religion than to have a high standard of living.

The AHP analysis produced the ten (10) highest criteria out of 17, the ten priority parameters which would then be further analyzed for the establishment of the Sea Tribe's socio-cultural resilience framework, namely: Accept differences, respect others, has religion, Courage, Trust other, Educated, Togetherness, Sedentary housing, Responsibility, and Open minded.

In the process, it could said that considerable changes had occurred in the positive category where indigenous tribes, namely Suku Laut, could be more advanced with the times and became prosperous human beings through openness and ownership of belief. Suku Laut understood the importance of education and send their children to school. Nevertheless, the government needs to recognize that this change would affected Suku Laut, who used to live in peace with nature, would compete with modern humans to satisfy their desires. In the Suku Laut community, which has a tradition of married with cousins, marriage education still needs to be socialized.

Socio-Cultural Resilience Framework

City Resilience Framework (CRF) divided the resilience framework into four dimensions, namely: 1) Health and wellbeing, 2) Economy and society, 3) Leadership and strategy, 4) Infrastructure and ecosystems (Rockefeller Foundation and ARUP, 2015).

Changes in social dan cultural values that impacted the vulnerability of local communities' social values, culture, and identity require an appropriate strategy of resilience. This socio-cultural resilience strategy could be a reference for the government in designing policies to maintain the Suku Laut community's social, cultural, and local identity values.

The framework was an effective instrument for demonstrating a comprehensive plan in city management. A lack of precise planning and framework could reduce the effectiveness of regional and city resilience. Therefore, by conducting a comprehensive analysis of the social and cultural parameters, it was necessary to have a framework as an essential instrument to increase resilience and implement resilience strategies for the sustainability of the socio-cultural values of the Suku Laut in mainland Batam.

The socio-cultural resilience framework adopted the dimensions of the Urban Resilience Framework (CRF) issued by the Rockefeller Foundation and ARUP and integrated the ten (10) highest criteria of the social and cultural (norms) changes of the Suku Laut.

Table 4: Socio-Cultural Resilience Framework Criteria and Indicators

Criteria	Category	Resilience Indicators
Accept differences	Cohesive communities	Organization -Society
Respect others	Cohesive communities	Organization -Society
Has Religion	Adequate education	Education-Empowered Stakeholders
Courage	Diverse livelihoods	People-Employment
Trust other	Cohesive communities	Organization -Society
Educated	Adequate education-empowered stakeholders	Education-Empowered Stakeholders
Togetherness	Collective identity and community support	Organization -Society
Sedentary housing	Safe and affordable housing	People-Human
Responsibility	Minimal human vulnerability	People-Human
Open minded	Cohesive communities	Organization -Society

As in table 4 above, there were ten criteria of social and cultural changes currently prevailing in the Suku Laut community in mainland Batam. With the influence of development-industrial growth and urbanization, some changes occur in society, knowledge-education, economy-livelihoods, and housing-environment. The dimension of the Suku Laut community, which used to be closed and had limited socialization with outsiders, has turned into an open relationship with outsiders and has broad socialization with various tribes. The unity in society was getting closer, and the

relationship was more harmonious (cohesive communities), with active community involvement and solid social networks (collective identity and community support).

Changing economic conditions have altered cultural values in education in the families of the Suku Laut, which educate their children to be independent and capable of earning an income that meets their adult needs. Changes in livelihoods occur with a large variety of livelihoods (diverse livelihoods), whereas previously, the Suku Laut only had a livelihood as traditional fishermen catching fish with spears. Several other livelihoods include being a modern fisherman using motor boats and fishing gear, seaweed farmers (sargassum), charcoal makers, and employees to meet the basic needs of the Suku Laut (minimum human vulnerability).

Another significant change was Suku Laut, who used to live in *sampan berkajang*, nomadic in the sea. They could now lived permanently on the coast, built permanent houses with space and functions (safe and affordable housing). Even though the Suku Laut had a religion and understood the importance of education for their children, they still need more education from the government regarding disaster risk management for safe settlement and ideal marriage (empowered stakeholders).

The resilience strategy addresses the social and cultural changes of Suku Laut, who lived in traditional coastal settlements in sub-urban areas. The strategy intends to address the problem of vulnerability to social and cultural values of the Suku Laut community in maintaining the local identity and existence of the Suku Laut community. For this reason, the author produced a socio-cultural resilience framework explicitly made for the Suku Laut community as a government resilience strategy to preserve the social and cultural values of Suku Laut on mainland Batam, as shown in Figure 4 below.

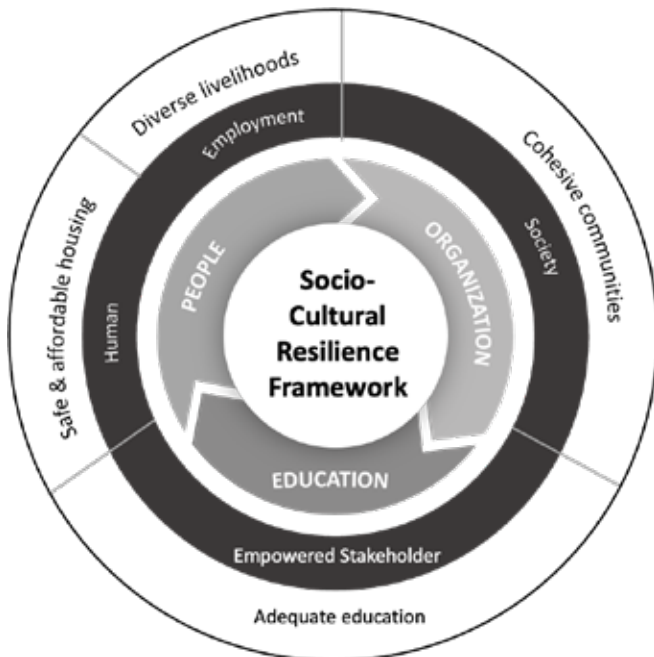


Figure 4: Socio-Cultural Resilience Framework of Suku Laut in Mainland Insular City

The government must consider three indicators from the socio-cultural resilience framework of Suku Laut in the insular mainland city for sustainable planning and development. In the first indicator, ‘People’ relates to Humans and Employment. Human focuses more on basic needs, whereas for the community, the most significant focus is adequate, affordable housing, health, and safe settlements for all communities. Meanwhile, Employment focuses on the diversity of livelihoods and ensuring the availability of livelihoods for the community. In the second indicator, ‘Organization’ relates to society and focuses on the community to create a cohesive and harmonious community so that mutual trust exists between the community and the public’s trust in the government. The existence of a cohesive community would have an impact on strengthening local identity and culture, where all citizens feel a sense of belonging.

The third indicator is ‘Education’ relates to empowering stakeholders (communities) through affordable and quality education for communities. Providing adequate disaster risk management knowledge was a positive value to equip the Suku Laut knowing what to do during unexpected events was an invaluable asset for resilience. In addition, adequate education would facilitate communication and cooperation between the community and the government in implementing resilience plans and management to preserve the social and cultural values of the Suku Laut in mainland Batam. This Socio-cultural Resilience Framework aims to assist the government in planning the development of traditional coastal settlement areas in the spatial plan regulations (RTRW) of Batam in the next twenty years to preserve the social and cultural values of Suku Laut on mainland Batam.

4. CONCLUSION

Along with the industrial and city development, coastal communities surrounding the mainland were slowly experiencing changes in social life. The Suku Laut community has a changed in social interaction and behavior, which turned out to be more open to others, comprehensive relationships, and solidarity with others. Openness impacted the entry of new values and cultures, eliminated the community’s original values. Even the existence of Suku Laut communities was possible only to become history, and Batam could lose its social and cultural heritage.

Each city had its characteristics, identity, and social and cultural values. Thus, resilience manifests itself differently in different places according to the character of the place. This framework formed the basis of a tool that allows for resilience and starts basing what matters most to make it more resilient. Ultimately, this led to new ideas and opportunities to engage new actors in society, government, and industry about what makes resilience. As recommendations for the government to ensure the resilience of the socio-cultural values of the Suku Laut on the mainland of Batam, the following needs to be addressed: 1) safe and affordable housing, 2) ensuring the diversity and availability of livelihoods for the community, 3) creating a cohesive and harmonious community through increasing

public trust in the government, and 4) empowering communities by providing affordable and quality educational facilities.

This research has limitations on Suku Laut in the mainland and did not discuss the hinterland; this limitation opens opportunities for further research to focus on the hinterland. Hopefully, other traditional tribes worldwide that faced similar threats to their social and cultural values could adopt this socio-cultural resilience framework.

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