

SOCIO-SPATIAL TRANSFORMATION: PERSPECTIVE OF MANAGEMENT OF COASTAL AREA DEVELOPMENT BASED ON OPTIMISING THE ROLE OF LOCAL COMMUNITIES IN MANADO CITY, INDONESIA

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Abstract: Socio-spatial transformation of urban architecture is a process that changes the elements of urban architecture and its formers. Development in coastal areas always impacts local communities on the coast. Sometimes they experience a process of change that requires them to adapt and even integrate situationally. This study aims to describe the socio-spatial transformation reality of contemporary urban architectural elements through a phased dynamic from the perspective of local communities in urban coastal areas. The method is conducted by qualitative research method. This is a single Case Study for identifies a specific case used to study real-life cases of the initiation of adaptation and integration of local communities. Data were obtained through participant observation, documentation and inductive in-depth interviews and focus group discussions that focused on descriptive theme analysis to understand the process of socio-spatial transformation of urban architectural elements in urban coastal local communities. The result of this study is a cycle of socio-spatial transformation of urban architectural elements is formed, consisting of (1) the natural, normal phase; (2) the adaptation initiation phase; and 3) the integration phase.

Keywords: Case study, cycle of socio-spatial, urban architecture, urban coastal.

Introduction

More than half of the world's population lives in cities and many of the world's densest conurbations are located on coasts, making coastal zones potentially productive for developing new forms of urban space in coastal cities (Brand, 2007). With the increasingly limited land in cities, land interventions in coastal cities tend to go to this area to put forward the concept of urban blue space in developing coastal cities as public goods and sustainable shared environments (Wessells, 2014). The trend of urban development towards the coastal areas because there are different periods in urban development and the major

influence is significantly optimised by an urban socio-spatial structure such as the evolution of urban socio-spatial structure, which shows the characteristics of expanding circle and gradual and stable transition (Wang & Liu, 2017).

The frequent changes that occur due to development in coastal areas bring periodisation or stages in its development. For example, authors have discussed the socio-spatial structure of planned community periods from early, transitional and modern (Wang & Liu, 2017), the adaptation process of evolving spatial functions, growing morphological diversity and the presence of road transportation (Surya, Saleh, & Ariyanto, 2018a), urban space regeneration

(Kazimierczak & Wrona, 2019), spatial integration and urban spatial interaction (Ahmad *et al.*, 2020a), spatial evolution experiencing different trends (You *et al.*, 2021), and Torrens *et al.* (2021) reviewing the sustainability transition theory of urban change. All such changes evolve through restructuring local economies across space (Panori *et al.*, 2019).

One form of spatial evolution that always receives attention is the impact on coastal areas that arise due to development on the coast, which causes the stages of transformation and evolution of coastal space (Waiyasusri & Chotpantararat, 2022). Recent studies related to development in coastal areas show that various impacts due to development in coastal cities ranging from environmental, socio-cultural and socio-economic impacts to changes in spatial structure and spatial patterns, are increasing in various coastal cities (Surya, Saleh, & Remmang, 2018b; Surya *et al.*, 2019; Hadijah *et al.*, 2020b). Some coastal cities are surprised by various development impacts that significantly affect socio-spatial transformation, such as Algeria (Bulakh, 2022), South Korea (Park *et al.*, 2020), West Africa (Nlend *et al.*, 2018), and China with its Green Development (Shang & Liu, 2021).

The development of road networks in coastal areas shows the existence of stages that cause socio-spatial transformations such as population growth, changes in socio-economic functions, increased economic productivity, sociocultural transformations towards differences in interaction and adaptation to the function of developed spaces marked by inequality in control of reproductive space which causes social change, community segmentation, marginalisation and poverty of local communities, and have been exposed to air pollution and are less comfortable for community activities (Surya *et al.*, 2019; Suriandjo *et al.*, 2021). The process of socio-spatial transformation that occurs in cities through strong spatial growth has significant negative impacts on the affected communities. Fragmented, incomplete, contradictory spatial

modernisation processes, lack of urban policies, uncontrolled private investment and private business interests are the main sources of transformation (Álvarez de Andrés *et al.*, 2015; Gnatiuk & Kryvets, 2018).

Such impacts give rise to various socio-spatial problems, such as land use change, social change and disruption of the coastal environment. While the impacts of coastal road construction have been widely reported in the media, there is little post-secondary literature describing the transformation process. To understand the problem, we must examine the socio-spatial transformation process in the urban architecture literature. While Guerrero Valdebenito and Alarcón Rodríguez (2018) discuss the process of socio-spatial transformation of urban architecture that often poses a threat to traditional sociocultural, economic, and habitability practices, other studies address the impact of development in coastal areas that affect spatial behaviour (Yılmaz & Terzi, 2021), the phenomenon of the transformation of urban space from being oriented towards the sea that has changed towards the land (Setioko, 2013), and socio-spatial interpretations that recommend urban response policies to address the spatial transformation of urban form in the future (Al-Tal & Ahmad Ghanem, 2019). However, most of these studies only discuss the impact of development on changes in the physical environment, sociocultural changes, and socio-economic changes in coastal areas, and the existence of transitions and community integration to the impacts of these changes. This means that there are no results of studies that focus on the process of social-spatial change that can describe every stage that affected local communities go through. So, there is a gap that can be filled by this research which can describe the process of social-spatial changes in urban architectural elements in gradual dynamics.

There is a need to study the socio-spatial transformation of urban architecture in the process to develop conceptual models for future studies and identify the changes that occur at each phase and/or stage. By studying socio-

spatial conditions and characteristics, we can shape and transform urban spaces to improve people's lives and reduce polarisation (Zain *et al.*, 2018). We need to understand better the socio-spatial dimensions of urban architecture and the issues of local communities involved in and affected by coastal development activities. In-depth qualitative case studies that examine the context of an incident can shed light on such conceptual and pragmatic understandings. The study presented in this article is a single-case qualitative analysis that describes the socio-spatial transformation of the city's architecture in each phase. We ask the following research questions:

- What happened?
- Who was involved in each stage and/or phase?
- What changed in each phase that emerged at the start of the construction of Jalan Boulevard II, during the construction transition and post-construction?
- What theoretical ideas help us understand the process of socio-spatial transformation of the city's architecture, and what are the unique changes in the socio-spatial dimensions of urban architecture?

The study aims to describe the process of socio-spatial transformation of the city's architectural elements today through a phased dynamic from the perspective of local communities in urban coastal areas.

After this introduction, the material and method section follows, then the results and discussion section, and the last section is the conclusion. This is the structure and organisation of this research.

Materials and Methods

Study Area

The three villages are located in the Boulevard II corridor of Manado City and are at coordinates $1^{\circ}29'59.66''$ - $1^{\circ}30'52.05''$ LU and $124^{\circ}50'27.24''$ - $124^{\circ}50'41.67''$ WEST. The three villages used as research locations in this study are Sindulang Satu, Sindulang Dua, and Bitung Karangria in the Tuminting sub-district. They are located in Boulevard II Manado City and are at coordinates $1^{\circ}29'59.66''$ - $1^{\circ}30'52.05''$ N and $124^{\circ}50'27,24''$ - $124^{\circ}50'41,67''$ E. The research location is presented in Figure 1.

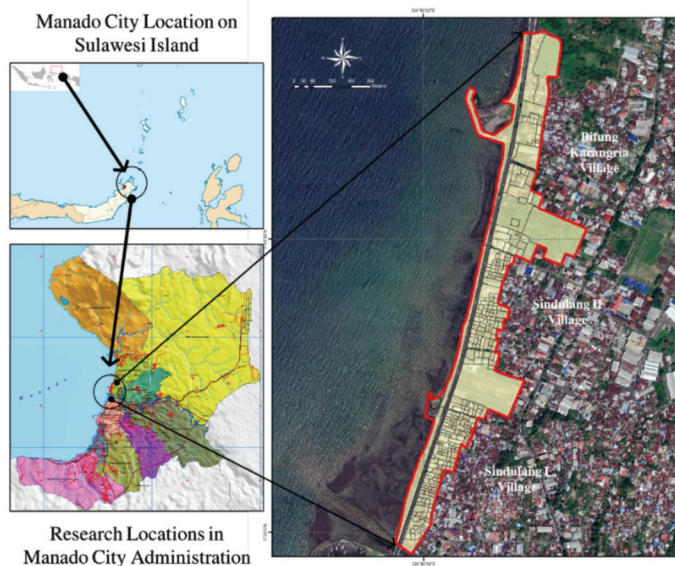


Figure 1: The location of the Boulevard II Corridor in Manado City

Data Collecting Techniques

The researcher used a single Instrumental Case Study method in this study. It was chosen to explore real-life, contemporary bounded systems through detailed, in-depth data collection from multiple compound sources of information and report case descriptions and case themes (Creswell & Poth, 2018).

Purposive sampling techniques were initially used in this study. Based on the focus of this study, informants from the local community in the research location are indigenous people who live permanently in the research location. They have lived in the area for at least 20 years, work as fishermen, and/or have switched professions due to the construction of Boulevard II Road. Furthermore, the snowball technique was used to develop data and information further.

The main data was obtained through semi-structured in-depth interviews using open-ended questions, participant observation, literature review, documentation, and Focus Group Discussions (FGD), which were also conducted to complement the missing data to find new ideas and categories. The zig-zag process collects information until the categories are saturated on the purposively selected interviewees, and data is collected until each category is saturated (Creswell, 2015). After the interviews and preliminary data analysis, preliminary codes and

categories were obtained to be simplified into several themes (Creswell & Poth, 2018).

Sample Size and Data Saturation

The threats that often arise in qualitative research are the validity of the data, such as various inconsistent statements, inaccurate data, and generalisation of data. For this reason, we use a triangulation technique to reduce this threat and end with a member checking in the FGD. Triangulation (data sources, methods, and time) was conducted through different sources of informants and prolonged time in the field (prolonged time) as an effort made also to understand more deeply the phenomenon under study and achieve data saturation (Creswell, 2014). Finally, the member-checking method was used in the form of a Focus Group Discussion (FGD) to determine the accuracy of the research results. The results of the FGD can help researchers revise their themes according to informants' views if it turns out that the explanation is not agreed by the informants (Creswell, 2016).

Creswell (2015) states that in some cases, it can study up to forty individuals. Based on the statement, 40 informants were interviewed in this study, half participating in the FGD. The characteristics of the informants are presented in Figure 2, which describes the percentage of employment, which is dominated by 32% of fishermen.

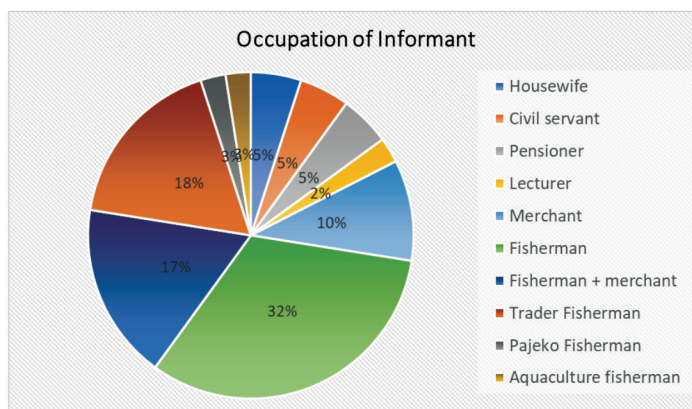


Figure 2: Occupation of informant

Data Analysis Techniques

The theme analysis is descriptive, detailing the case and its setting from multiple data sources with evidence of each phase in the evolution of the case (Creswell & Poth., 2018). The initial analysis involved coding the in-depth interviews and translating them into initial categories. The initial categories are then focused on the formed themes. This analysis procedure according to the stages, consists of (1) data category coding; (2) grouping categories into themes; (3)

confirmation of the theme in the field; and (4) synthesis of themes into theories.

Drawing conclusions from the analysis is done by comparing the findings with the findings and conclusions of other studies, which usually use different approaches and methods that are relevant in clarifying, modifying, explaining and enriching this research (Salman *et al.*, 2021). The data categorisation process to find the related themes using causal loop diagrams can be seen in Figure 3.

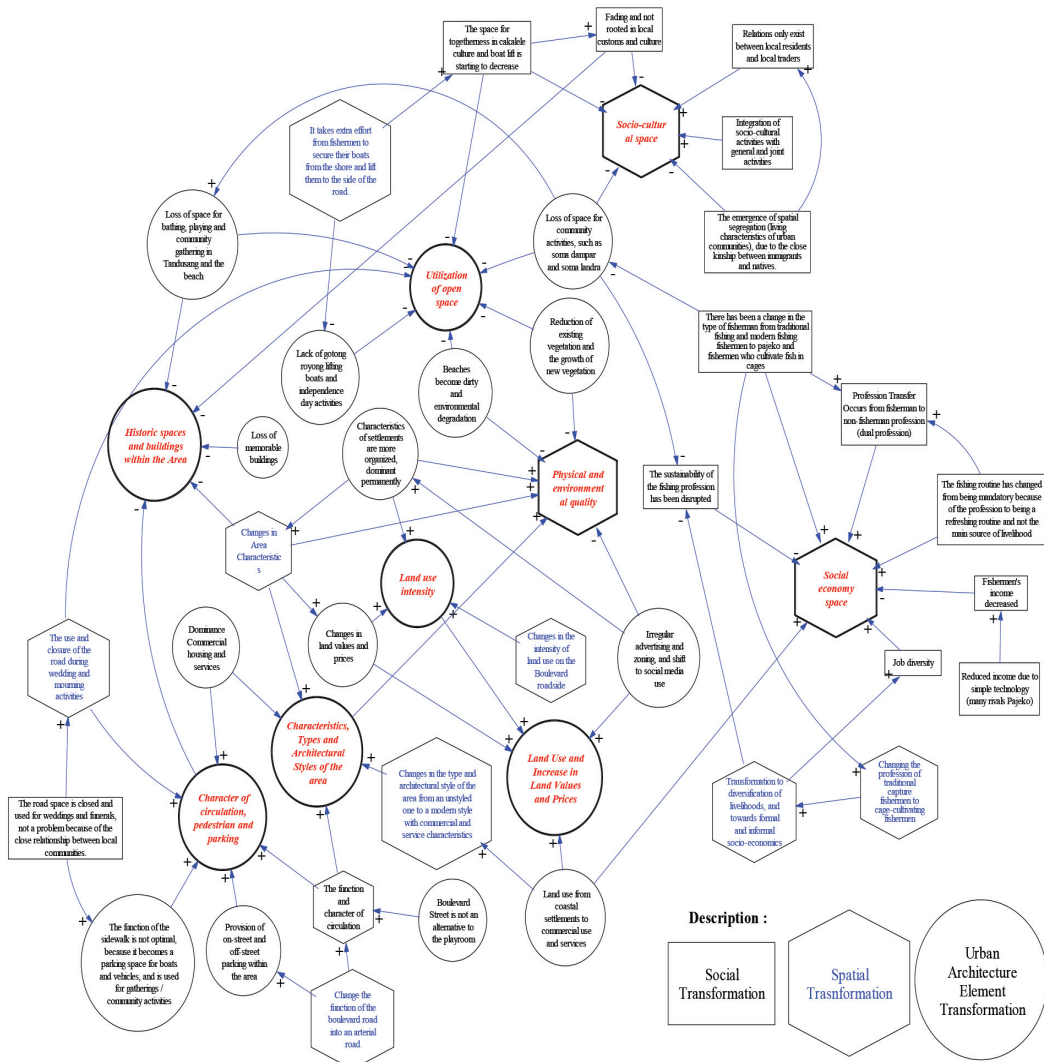


Figure 3: Process of categorising data with causal loop diagrams

Results and Discussion

Normal Phase (<1990)

The first phase in this process is the Normal Phase in the time before the 1990s, characterised by the condition of the urban coastal area before the construction of the Boulevard II Road, which was around the 1980s; the lifestyle of the local community in this case the Fishermen community was in a normal standard of living.

From 1970 to 1980, dozens of trawling businesses were owned by indigenous family employers and people of Spanish-Portuguese descent who had long settled and built Borgo villages on the Manado coast. Netting and catching fish for fishermen on Manado's coast was a way to survive. However, it was also a culture that united the fate of thousands of fishermen scattered along the coastline. They hunted for the sea's bounty in the same rhythm, with trawls illuminated to mark the spot where they were stranded. The guard fishermen would be waiting, and when the trawl was pulled ashore, the beach would immediately erupt with shouts of "Pull the rudder" Other fishermen on guard on land immediately would run towards the sea to help pull the trawl ashore.

During this period, the waterfront area stretching from the Tondano estuary to the Bailang estuary, which is currently the object of the research site, was a coconut plantation area and also a fishermen's village. In that era, at night, we would see rows of lights from fishing boats floating beautifully in Manado Bay, while on other days, the trawl could be stocked at dawn when the sea birds cheerfully chirped to signal a school of pelagic fish entering the bay. That was when Manado's coastal fishermen truly enjoyed the abundance of the sea's gifts.

When the full moon arrives, the fishermen of *soma dampar* or trawl would rest from their activities and make a thanksgiving party for the bounty of the sea on where they depended on. Before the construction of the Boulevard II Road, the situation at that time was so easy for fishermen to catch fish, fishermen's activities before and after fishing were carried

out on the beachfront, such as preparing boats and nets, unloading seafood, chatting in the *daseng*, making fishing nets, even some groups of residents made social gatherings in the beachfront area on Sundays/holidays. Other local community activities included walking and running on the beach, enjoying the calm waves, gentle breeze. Moreover, the atmosphere was more beautiful when the moon was full, where a Thanksgiving party held as mentioned above.

Some local communities who work as fishermen tell stories of how the coastal area was at that time:

"I used to know that the beach was still neat, there were no other disturbances. At that time, I helped pull the trawl. I often slept on the beach. There were many *soma dampar* or trawls. Cries of "Pull the bow" and cursing were often heard. In fact, I often slept on the beach because it was so beautiful at that time."

"The beach was very nice. The water was blue and there was rarely any trash. There used to be only *woka* leaves around the *daseng*. It used to be so beautiful that when we were young and teenagers, if we wanted to go to the beach, we would pull *soma* directly into the sand without thinking about it."

"The beach used to be beautiful. On full moon nights, we would sleep on the sand. I was a teenager then. Now we rarely do that anymore. Bathing on the beach is also rare now, which only can be done in a few places, here and over there."

The Adaptation Initiation Phase (Year 1990–2010)

The second phase of the process, the Adaptation Initiation Phase, was characterised by early decision-making and actions initiated by the local community. The local community entered this process by initiating to adapt to the process

of physical change in the area due to the construction of Boulevard II Road. Although it was not the only reason, many local communities stated that they began to utilise the spaces created by the construction of the Boulevard II Road. In this phase, local communities tried to carry out social activities related to utilising newly formed spaces, in this case, when the coastline was landfilled for the construction of Boulevard II Road, which was used for open space functions, gathering and playing. During this Adaptation Initiation Phase, the local community began to initiate whether to stay in the area or choose to leave it. Fishermen groups also initiated adaptation by making access to up and down boats by rails or girders due to the loss of beach sand for their boat moorings.

The Integration Phase (Year 2010 – 2020)

The integration phase represents the last phase of the main-stream process of socio-spatial transformation of the urban architectural elements. At this point, the local community saw their efforts to adapt to the construction of the Boulevard II Road as already in the integrated phase. Most of the local communities were also taking advantage of the impact of the construction of Boulevard II Road, such as direct access and the area becoming more crowded and safe from waves during dangerous weather.

At this point, the local community entered a cycle of socio-spatial urban architectural elements transformation through the normal phase, the initiation phase of adaptation, and the integration phase. This cycle shows that when a process of socio-spatial urban architectural elements transformation occurred and was successful (for example, bringing a good impact to the area), major benefits to local communities and the region became visible and resulted in a better regional arrangement in terms of architectural element changes of the city in the area, and of course, it would be integrated with the sustainability of the socio-economic and socio-cultural life of the local community.

This condition will create a circular cycle, although the last integration phase becomes

a key point for starting new local community life activities as part of the Boulevard II Road construction integration. The cycle that occurs at the end of the process is an important long-term condition of the normal phase of local community activity that takes time and can reach the initiation and adaptation stages. Since it takes time for the benefits in the initiation phase of adaptation, it will take time to reach the Benefit cycle of the integration phase.

Achieving this cycle leads the local community to feel that the socio-spatial of urban architectural elements transformation has been integrated and integrated into the life of local community activities. Although local communities still must struggle to maintain fishing activities, some have begun to adapt and integrate with the urban environment. The local community integrates into various ways, including changing professions but not leaving the side activity of being a fisherman, changing professions temporarily when unable to go to sea, and returning to sea when the weather is good, then other integration by selling their plots of land to move to other areas, rent or lease their dwellings, or also survive by carrying out repairs and renovations to suit the use of space areas that are turned to commercial functions and services.

Model Process of Socio-Spatial Urban Architectural Elements Transformation

The rich and illustrative descriptions of the local communities affected by the construction of Boulevard II become the basic framework that explains the transformation of socio-spatial urban architectural elements in coastal areas. The framework or model shows the socio-spatial changes in urban architectural elements experienced by the local community throughout the Boulevard II construction process. The model presented in Figure 4 shows a kind of mainstream through which local communities go through phases of transformation and delay stages in each of these phases. The flow throughout the process is characterised by three phases: the normal phase, the adaptation

initiation Phase, and the integration phase. Each phase in the process represents every important socio-spatial change and architectural element of the city. The arrows move directly from one phase to another, entering and exiting each phase.

From the framework of the model, a cyclical process of socio-spatial changes in urban architectural elements can be found, which will continue to cycle and each phase is triggered by development in the area. In the context of this research, the impact and benefits felt by the local community in the adaptation initiation stage can be seen in the increase in land value, which initially in the 1990-2010 period was only around IDR 200,000.00/M², increasing to IDR 4,000,000.00/M² in 2010-2020. Local communities utilised the increase in land value by selling their land and in this phase, also after being stopped in the time delay zone, the initiation was continued to restart the adaptation of socio-spatial changes in urban architectural elements leading to an integration phase that no longer shows the impact, but rather integrated benefits. In the integration

phase, there is also a change process in the local community of fishermen who were originally traditional capture fishermen (characteristic of rural fishermen). Through the initiation phase of adaptation, they finally integrated into the local community of cultured fishermen and pajeko fishermen, as well as the tendency to have multiple professions (characteristic of urban fishermen). A simplification of the cycle can be seen in Figure 5.

Time Delay

Although the Normal Phase-Initiation Phase-Adaptation Phase-Integration Phase cycle appears to be the last box in the process, another important dynamic component contributes to accelerating the socio-spatial transformation process so that this urban architectural element occurs. The dynamic and flexible nature of time delay is an important variable in this transformation process. After going through the cycle and integration, the local community realises that it must initiate to adjust to the socio-spatial changes and changes in urban architectural elements that occur along with the

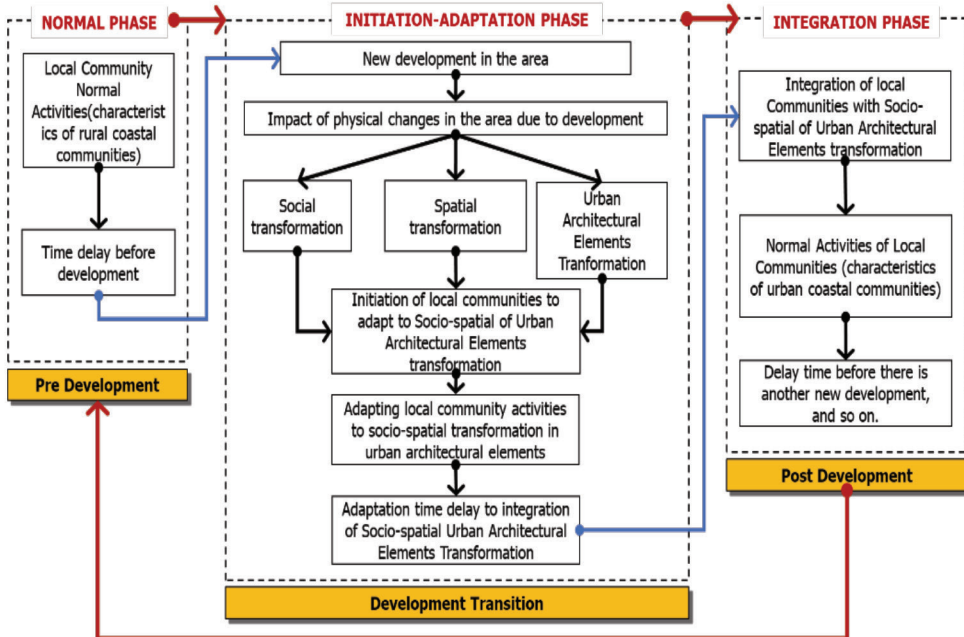


Figure 4: The model framework for the socio-spatial of urban architectural elements transformation

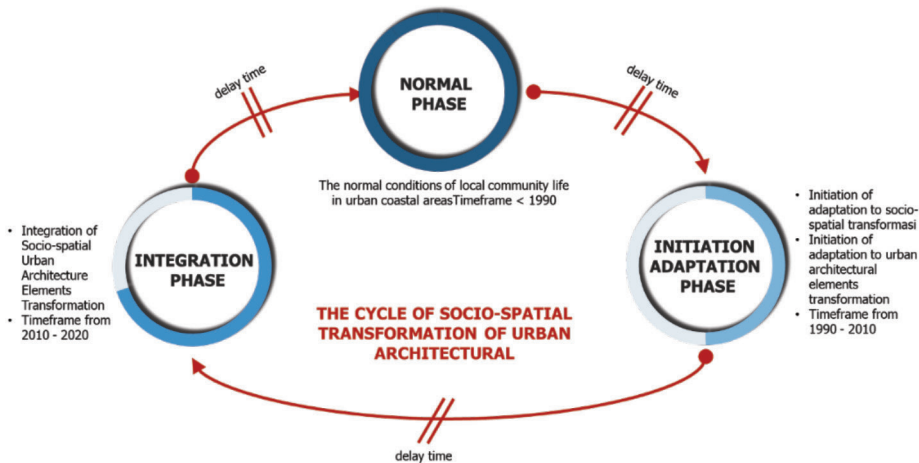


Figure 5: The cycle of socio-spatial transformation of urban architectural elements

time delay as shown by the flow of arrows from the normal phase to the adaption initiation phase and the integration phase.

Under these conditions, the local community, in this case fishermen, initiated by following each stage of socio-spatial change and changing the city's architectural elements according to the needs of the local community. The reasons include changes in profession or occupation, the impact of spatial changes, and land use transformation. Time delay is a moment when local communities begin to realise their position in the Region, especially adapting to the process of socio-spatial change. It begins with the realisation that changes to the architectural elements of the city are needed and it is done in order to adapt towards integration with gradual land use changes that have transformed into service and commercial functions. By choosing to make physical changes to the building and continue to function as a roadside residence for commercial and services, the local fishermen community tries to adjust to changes in life due to the impact of socio-spatial transformation. In doing so, the local community is at the stage of sustainable integration and enters the cycle of the initiation phase of adaptation to the integration phase.

Time delays are also experienced by the local community in action efforts and actions

whether to stay in this corridor with all the consequences of change or choose to leave this situation of socio-spatial change, which indicates that the local community is unable to adapt and integrate through the necessary changes in urban architectural elements. Under these conditions, the time delay from the normal phase (pre-development) to the adaptation initiation phase (development transition) is approximately 20 years, while the time delay from the adaptation initiation phase to the integration phase is 10 years. It is not yet known exactly how long the delay from the integration phase to the normal phase will take. For this reason, in-depth studies need to be conducted, especially in different locations already passing through this integration phase. This may be both a shortcoming and an opportunity for future research. For example, when the local community of fishermen who described the time delay realised the changes on the waterfront to the need for boat parking, by making access rails to get on and off the boat as follows:

“To get to the beach, we make a road like a rail to help lift the boat. One person made it with concrete because his sibling was able to help him.”

“Boat parking used to be on the sand. Since there is this road, some have also placed them on rocks, making rails. It

was better when fishermen used to work in the sand without fear of damage, but now they are worried.”

“When there were problems in lowering the boat, they used wooden rails, but in practice, when the waves are still the boat can be destroyed, so many people take it to *Kali Mas* (locally named the tourist port). But they did not realise that there was a flood in the river, so they finally brought it back to the beach, just twirling around here.”

This time delay is more likely for those who have limited funds, but at least it can be seen that there is a great desire from the local community to change the physical appearance of their current residence. However, financial constraints were the main factor that made these changes infrequent. One member of the local community told a story and described the time delay in the context of the funding factor when deciding to start improving residential housing as follows:

“My house is permanent. Even then, it was not built all at once. When there was funding, I started rehabilitating it, as I recall starting in 2009.”

“The reason for starting to repair the house, huh? You already know what fishermen are like; if there is sustenance, there is sustenance, but if there is not, there is not. So, when I had more money, I could repair the house.”

“The local community has started to improve by facing their houses to the front of the road since the pavement was laid in 2010. The reason for repairing is because they want to have a restaurant business, even if it is small because they need money/capital. If you do not have money, you cannot repair your house even if you like it.”

Most local communities lived with limited funds and money. So, it was quite difficult to fulfil their daily needs, *let alone* repair their houses. So, during this period of adaptation

initiation, the survival strategy was carried out by local communities who had limited funds, with the condition of the dwelling as it was, and only made minor repairs while adjusting the function of the building which began to adapt to commercial and service functions.

Discussion

The results of the theme analysis describe the process and stages of socio-spatial transformation of urban architectural elements due to the construction of Jalan Boulevard II in Manado City. The process is grouped into three important phases, namely: (1) natural normal phase, (2) transition phase, and (3) integration phase. Changes in urban architectural elements accompanied by socio-spatial changes that occur in each phase are important to understand the model framework that describes the process of socio-spatial transformation of urban architectural elements in urban coastal areas. The phases that identify the characteristics of the socio-spatial transformation of changes in urban architectural elements become new theories and concepts about the socio-spatial transformation of changes in urban architectural elements in urban coastal areas.

Research on socio-spatial change and urban architectural elements as a process has been conducted (Farhan *et al.*, 2020; Söylemez & Varol, 2020), but these studies do not elaborate on the process and its stages; they focus on factors that play an important role in the formation and transformation of urban architecture and specific urban structures such as religion, environment, and politics. The comparison is difficult because their study does not address the process of socio-spatial transformation but focuses on factors. Studies from (Benslimane & Biara, 2019; Yang *et al.*, 2020) reveal that natural conditions and socio-economic development influence town-rural transformation, i.e., the construction of new roads is the most significant factor and has destroyed many traditional houses in the old town. These findings only look at one cultural heritage element and do not reveal the process that occurs.

Studies related to the spatial transformation that is in contact with changes in the urban architectural elements have been tried to be done (Yunus, 2008), which found four elements that experienced changes: land use characteristics, building character, settlement character and circulation character. Then, a study by Syarif (2016) also found five elements of changes in urban morphology, namely: (1) land use pattern, (2) building form, (3) road pattern, (4) open space, and (5) concept of living. However, in both studies, the phases of architectural element change as a process have not been described in detail. This means there is no evidence of studies used to study the process of socio-spatial transformation of urban architectural elements. This means that this study is one of the few models that integrate socio-spatial transformation with changes in urban architectural elements and focuses on the phases and stages that occurred.

Case studies examine urban transformation processes, such as that of (Glitz Mayrink & Tardin-Coelho, 2021) "ISBN": "0000000248", "ISSN": "0124-7913", "abstract": "O artigo busca compreender como estratégias sociopolíticas, que não intervenham diretamente no espaço físico, implicam em uma reordenação do entorno construído junto com transformações de práticas sociais locais. Como caso de estudo são analisados os processos de transformação socioespacial desencadeados pela implantação da Unidade de Polícia Pacificadora (UPP). However, this study only deals with the socio-spatial transformation process triggered by the implementation of the Pacific Police Unit (UPP) in Favela Vidigal, in the City of Rio de Janeiro, which is analysed as a case study to review how the policy reinforces or does not reinforce the social exclusion and spatial segmentation dynamics historically targeted and identify the ongoing consequences. The study has not described changing processes and stages but only understood socio-political strategies that do not directly intervene in physical space, implying a rearrangement of the built environment and the transformation of local social practices.

Likewise, a study conducted by (Wang *et al.*, 2017) on the evolution of hierarchical structures and spatial patterns of coastal cities in China. They have tried to examine through time periodisation in 1995, 2005 and 2015 using city networks. The finding is that China's coastal city network has obvious hierarchical characteristics of the national coastal city-regional coastal city-local coastal city. In the 20-year development process, the hierarchy of coastal cities in China shows a progressive evolution of hierarchical spatial patterns and the network structure of coastal cities in China forms a three-tier network structure and three urban agglomerations. In their study, the time periodisation is known, and the main finding is the hierarchical structure, not just the process.

Relevant is the research on urban morphological change, vulnerability and resilience (Hameed Basee & Riadh Abdulla, 2022) that supports this study. Their findings have mentioned two different time periods, the historical and current phases, which show the amount of transformation due to urban development. The process of road development that crosses the historic area shows that transformation affects the ties that connect the urban fabric to the traditional spatial layout, which in turn affects the resilience of the system represented by the traditional alleys, streets and squares that were once bustling and filled with people and high internal energy. Modern changes led to increased vulnerability of urban performance to population activity and urban quality of life, also showing rapid adaptation to forced transformations at many levels due to the flexibility of traditional to modern forms. How did the region retain these characteristics until modern disturbances caused some positive and some negative transformations, as seen in the structural analysis of the Region in both phases? Adapting and responding to unusual events supports inter-social interactions in response to current developments and achieving economic and social demands as an urban physical-social-environmental balance system.

Hammeed and Abdulla's research is in line with the findings of this study, which consequently shows the actions and inactions of local communities that change their activities to initiate adaptation and integrate with the changes in each phase. The main difference is that the framework identified only two phases of regional development with some similarities to the adaptation initiation and integration phases in this study. The framework developed by Hameed Basee and Riadh Abdulla provides theoretical support for three important phases of the socio-spatial transformation model of urban architectural elements: the adjustment of local communities to the physical socio-spatial changes of the area, the dynamic nature of the process, the initiation of adaptation as reinforcing behaviour, and the integration of local communities into the changes of urban architectural elements.

Similar findings also emerged from the study of (Lin *et al.*, 2012), who compared and contrasted three periods: the traditional clan-based village, the commune period, and the period since the 1980s. Their focus relates to changes in how villagers gain access to resources and time services, and their findings suggest the limits of the three modes of economic integration as a concept for understanding the socio-spatial transformation of ViCs in China. According to the theory, access to exchange, redistribution and reciprocity markets is regulated, respectively, through "social utility", "citizenship" and "affiliation". In essence, their findings found three periods and have tried to describe the process of socio-spatial transformation associated with the socio-spatial changes in inner-city villages.

This finding is supported by (Pavel & Jucu, 2020), who conducted a study related to urban icons that emerged due to ongoing urban changes that always preserve the culture of the city, how urban transformation and cultural evolution traced the most relevant cultural stages that contributed to the formation of post-socialist urban identity. The way each period left a distinctive spatial mark on the city is analysed

about contemporary challenges and new opportunities for the future. They highlight that in the face of various political regimes flowing over time, the cultural heritage of a city can be preserved, thus generating a valuable framework for capitalising on local culture. From this study, there is a time that is the focus of change that at least reinforces the current study regarding the cycle of socio-spatial transformation of the city's architectural elements.

Most relevant and having much in common is the study of (Del Bo, 2020) nature and artifice, alternating over time, have provided Bovisa—a strategic area in Milan—with a legacy full of contradictory signs such as the negative effects left by the productive apparatus, the vigorous return of nature and the marked evocative value of the remaining buildings, living deposits of a not-too-distant past. The development of the project, presented in the context of a Call for Ideas (Moro in Bovisa, un parco per la ricerca e il lavoro. Maggioli, Milan, 2017, the findings of which involve three sequential phases shown for transformation: (1) the original phase of nature, (2) the phase of urban industrial services, (3) the phase when nature returns to occupy the spaces associated with abandoned jobs. The purpose of these phases was studied to improve the features of the area, proposing a transformation process that would allow the construction of a formally defined and complete urban section characterised by high accessibility and reduced vehicular traffic, built in a green environment according to the principles of sustainability, and equipped with activities, residences and services of a metropolitan nature. His findings clearly already describe the phases that occur in development, which is at least somewhat in line with this study.

Studies examining socio-spatial transformation have also proven how the phase concept is dynamic with its unique characteristics (Mandeli, 2019). The findings as an effort to sustain the socio-spatial changes of each phase, such as new development decisions, spatially changing urban spaces, improving places, increasing prosperity and expanding

modernisation expectations in many dynamic cities, will produce environments that reflect local values collectively and can shape public areas in developing cities to form quality urban spaces.

We really want to convey in this study that our findings can support and fill in the gaps of socio-spatial change processes in each time period and how local community efforts initiated and integrated with urban architectural changes after the construction of Boulevard II Road that were not seen in previous studies. So this is illustrated in the framework of the socio-spatial transformation model of urban architectural elements that places a clear phase of initiation of adaptation when local communities initiate, then they are integrated based on the need or desire to initiate changes in urban architectural elements. In this phase, the local community of fishermen try to adapt to the condition, build their shelter, make access in the form of girders that make it easier for them to raise and lower their boats to the beach, and see any potential that is useful for them related to the goal of sustainability of their profession.

Even when local communities do not fully try to adapt to socio-spatial changes, they can try various aspects of the process to integrate with changes in the urban architectural elements, including by taking advantage of economic opportunities through the informal sector, such as becoming traders by converting roadside residences into kiosks and utilising sidewalk space for selling. Another important finding in this study is how the cycle of socio-spatial transformation passes through the normal phase to the adaptation initiation phase and continues to the integration phase of the next stage. Furthermore, in this study, the cycle of socio-spatial transformation of urban architectural elements is described as a dynamic state, which is a state that is periodically adjusted through a time delay between one phase and another.

Time delay is another important element of the socio-spatial transformation of urban architectural elements. This time delay is common among local communities

and is not separate from integrating socio-spatial transformation into changes in urban architectural elements. When time delays occur, this does not mean that local communities cannot adapt to the changes. Rather, it means they are under financial constraints, as funds are important in initiating adaptation and leading to the integration phase of the changes. When the time delay is considered complete, the local community does not return to the initial efforts of the transformation process when they decide to make improvements to their dwellings and adapt them to commercial services. At that point, they pass through two initiation phases, the first being the initiation phase of adaptation and the second re-entering the process through the re-initiation of adaptation.

The concept of a cyclical U-turn throughout this phase and the different states in which the process begins and ends also describe the U-turn through this stage. There is not much evidence on the process of socio-spatial transformation of urban architectural elements in the realm of local communities in coastal urban areas using the concept of cyclical feedback loops, so this is a completely new cyclical finding to research.

Further support for conceptualising a cycle of socio-spatial transformation of urban architectural elements consisting of a normal phase - initiation phase - adaptation phase - integration phase in local coastal urban communities, although not the same, can also be found by applying the city life cycle model. This study explains the basis of the well-known life cycle pattern of urban growth. There are 3 city lifecycles including rapid growth, slow growth, and a period of shrinkage; not all cities go through the entire lifecycle at a non-uniform rate. The interaction of forces that shape the entire range of urban growth patterns and identify specific combinations of values create phase transitions between these patterns and these characteristics are highly dynamic and play a central role in the system. The simulation of life cycle patterns of urban growth for a large number of cities and urban systems in the context of very different geographical, social and economic environments

will contribute to building a comprehensive theory of urban dynamics, which in turn will allow the formation of specific urban policy measures, capable of supporting flexible and tailor-made urban management policies, which are more needed now than ever, including also having distinguished several phases in the development and social transformation (Czamanski & Broitman, 2018; Mihaylov *et al.*, 2019).

There are many other opportunities for study. When the whole socio-spatial transformation of urban architectural elements is better understood, ideas can be put into action and postulated and measured. Until that point, any shortcomings in theorising the socio-spatial transformation of urban architectural elements that are weaknesses in this study should still be utilised in future research. By researching local communities that have successfully integrated with the changes that have occurred, at least in local communities that have passed the impact of the construction of Boulevard II Road and have entered the next stage of reclamation, of course with a different location from the location of this research, is a challenge to generalise the theory found through sustainable strategies to overcome the obstacles that local communities may face when they are in the integration phase to the normal phase again, to enter the time delay zone then and wait for the next development. It is hoped that by understanding the process of socio-spatial transformation of urban architectural elements, each phase passed through the model found can be described and strategies applied to develop models in coastal areas that can reduce the impact on local communities in coastal cities with different locations.

Conclusion

The results of this study found that in each process of socio-spatial transformation of urban architectural elements, a cycle of socio-spatial transformation of urban architectural elements is formed, consisting of (1) the natural, normal phase; (2) the adaptation initiation phase; and (3) the integration phase.

The natural, normal phase is realised in the normal activities of local communities with rural coastal characteristics. The adaptation initiation phase is realised through (1) the existence of new development in the area; (2) the existence of socio-spatial changes and urban architectural elements as a result of physical changes in the area due to development; (3) the initiation of local communities to adapt to socio-spatial changes in urban architectural elements; and (4) the adaptation of local community activities to socio-spatial changes in urban architectural elements. This integration phase is realised in (1) the integration of local communities with socio-spatial changes in urban architectural elements; (2) normal activities of local communities characterised by urban coastal communities. Each stage in the phase passes through a time delay, and each delay is not the same for each phase. This study revealed that it takes 20 years to move from the natural normal phase (1990-2010) and it takes approximately 10 years to enter the integration phase and lead to the integrated normal phase, which is characterised by the return of normal local community activities integrated with the condition of the coastal area that has changed. In this condition, it is called a cycle because there will be a repetition of the natural, normal phase - adaptation phase - integration phase triggered by new development later.

Through case study methods that explore the urban architectural elements that have changed, it strengthens the previous findings of Suriandjo *et al.* (2023a), namely nine elements socio-spatial of urban architecture, which consist of (1) land use and land value increase; (2) architectural types and styles; (3) land use intensity; (4) open space utilisation; (5) circulation, pedestrian, and parking characteristics; (6) physical and environmental quality; (7) historic spaces and buildings; (8) socio-economic spaces; and (9) socio-cultural spaces. These elements are integrated into the cycle of socio-spatial transformation of urban architecture and in the context of Sustainable Development Goals focused on eight main lever factors, namely: (1) waste pollution, (2) residential densification,

(3) income, (4) hope for a new job that can be a permanent livelihood, (5) social class, (6) rooted culture, (7) architectural type and style, and (8) land use intensity (Suriandjo *et al.*, 2023b).

The limitation of this study is that most of the data sources come from in-depth interviews, so there is very little numerical evidence to support changes in urban architectural elements. That is, developing a socio-spatial theoretical model of urban architectural elements with supporting numerical evidence is possible, including further studies that can test the effect of the significance of each dimension that changes and other studies that can determine the influencing variables and the dependent variable.

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