
EXPLORING THE SPATIAL MECHANISM OF INCOME GENERATION SPACE IN OYSTER SEEKER VILLAGE, BANDA ACEH

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ABSTRACT

The oyster seeker community in Alue Naga relies on the coastal environment for finding, cultivating, harvesting, processing, and selling oysters. The spatial dynamics of interaction among humans, oysters, and the coastal environment that generates income for the oyster-seeking community remains thoroughly underexplored. This study investigates the spatial mechanisms of income-generating spaces created by oyster seeker activities in Alue Naga, Banda Aceh, Indonesia. The research aims to explore the spatial patterns formed by the activities and practices of oyster seekers that contribute to their daily income. This study employs a design-driven research method, utilising a qualitative approach shaped by design thinking, spatial sensitivity, and a thorough architectural understanding using meaning from interviews and on-site observations. The research indicates that income-generating activities in Alue Naga oyster seeker village are established through three different spatial mechanisms: 1) the utilisation of land and water border areas, 2) the use of time and domestic space as components in the income-generating process, and 3) social aspects as the engine of spatial mechanism to generate income. This research also reveals that coastal environments can generate spatial mechanisms that shape income-generating spaces for coastal communities, which should be considered when designing spaces, architecture, and urban contexts.

KEYWORDS: Alue Naga, design-driven research, income generation space, oyster seeker, spatial mechanism

Komunitas pencari tiram di Alue Naga menggantungkan hidup pada lingkungan pesisir disekitarnya untuk mencari, membudidayakan, memanen, mengolah dan menjual tiram. Dinamika spasial dari interaksi antara manusia, tiram, dan lingkungan pesisir yang memfasilitasi proses menghasilkan pendapatan bagi masyarakat pencari tiram masih belum dieksplorasi secara menyeluruh. Tulisan ini menganalisis mekanisme spasial ruang penghasil pendapatan yang terbentuk melalui aktivitas pencari tiram di Alue Naga, Banda Aceh, Indonesia. Penelitian ini bertujuan untuk mengeksplorasi pola spasial yang tercipta dari aktivitas pencari tiram dan praktik-praktik yang menghasilkan pendapatan harian mereka. Penelitian ini menggunakan metode design-driven research, berupa pendekatan kualitatif yang didorong oleh pikiran desain, kepekaan spasial, dan pemahaman arsitektural secara menyeluruh dengan menggunakan pemaknaan dari interview dan pengamatan di lokasi. Penelitian ini mengungkapkan bahwa aktivitas menghasilkan pendapatan di kampung pencari tiram Alue Naga terbentuk melalui tiga mekanisme spasial yang berbeda: (1) pemanfaatan area perbatasan darat dan perairan, (2) penggunaan waktu dan ruang domestik sebagai komponen dalam proses menghasilkan pendapatan, dan (3) aspek sosial yang berperan sebagai penggerak ruang menghasilkan pendapatan. Penelitian ini juga mengungkapkan bahwa lingkungan pesisir memiliki kapasitas untuk menghasilkan mekanisme spasial yang membentuk ruang-ruang penghasil pendapatan bagi masyarakat pesisir, yang menjadi pertimbangan untuk merancang ruang, arsitektur dan konteks perkotaan.

KATA KUNCI: Alue Naga, design-driven research, income generation space, pencari tiram, mekanisme spasial

INTRODUCTION

Urban areas in emerging nations have demonstrated that houses, their surrounding neighbourhoods, and the environment have a purpose beyond merely living spaces. It served as a place of employment to sustain the economic well-being of low-income households and those without jobs (Tipple, 2005). Using income-

generation spaces enables self-employed people to integrate their income-generating activities into their daily routines rather than conducting them in a separate location (Thai et al., 2019). These spaces enable individuals from low-income groups to incrementally expand their economic resources and fund themselves through various sectors of informal activity (Suhartini & Jones, 2023; Sunarti et al., 2019).

These activities are also prevalent in some areas of Banda Aceh, the capital city of Aceh Province, particularly in Alue Naga village, where oyster seekers reside.

Alue Naga is a village located in the coastal region of Syiah Kuala Sub-district, Banda Aceh, Indonesia, which has effectively rehabilitated following the Aceh Earthquake and Tsunami disaster two decades prior. The catastrophe destroyed numerous nearby structures, encompassing the village's public amenities, educational institutions, healthcare facilities, places of worship, and residences. However, the community currently reoccupies the village, primarily with low-density landed dwellings (Fadhil & Putri, 2024). The Alue Naga village was revived by leveraging the natural coastal conditions after this significant disaster. After the disaster, most individuals engaged in the informal sector to generate income. The concepts of informal sector, covering informal trading and local production, are essential to the income generation studies (Dovey, 2016; Dovey et al., 2020; Kamalipour, 2016). Most local communities rely on marine resources as one of their primary sources of income. The Alue Naga communities mainly engage in fishing, oyster harvesting, and trading to make revenue. Alue Naga has long been recognised as a premier region for producing high-quality oysters in Aceh. Therefore, oysters contribute significantly to the daily activities of the Alue Naga community.

The current development of the Alue Naga region, which includes community amenities, expanded residential zones, coastal areas, ponds, and oyster farms, is offering renewed optimism for the local population. This region contains multiple residence sites for oyster seekers, distributed across four hamlets: Kutaran Hamlet (196 households), Musafir Hamlet (195 households), Tuan Po Diamat Hamlet (44 households), and Beunot Hamlet (59 households) (SIGAP, 2024). Following the 2004 Earthquake and Tsunami, significant advancements have occurred in the oyster farming sector within the Alue Naga region. The government, the village, and several external organisations implemented various initiatives to enhance the community's income through oyster farming. These efforts included training programs, funding for breeding equipment, and establishing designated reservoir areas for oyster cultivation. The Alue Naga community is enhancing their identity and welfare through oyster cultivation. The oystermen leverage the surrounding environment and resources to generate income and sustain their daily livelihoods. Several places in the area serve as sites for the daily activities of the oyster-seeking community. They utilise the houses and its environment for multiple activities, such as foraging, processing, and selling oysters, functioning as a spatial mechanism for income generation. Diverse spatial

elements and configurations facilitate income generation, resulting in a network of spatial mechanisms.

Income generation practices in certain areas emerge within the informal settlements. Many recent studies highlight informal settlements as the main context for informal home-based enterprises (Chen & Sinha, 2016). This situation mainly occurs in developing nations characterised by close social ties and strong cultural foundations, therefore it is essential to emphasise the interpersonal dimensions and spatial practices of everyday life (Harani et al., 2021). This everyday practice is manifested through connections and interactions across various scales of urban structure, shape, and social dynamics (Suhartini & Jones, 2023). The sociocultural context of the Alue Naga people are reflected in their daily activities, particularly in the gathering, processing, and selling oysters as their primary source of living, establishing a spatial mechanism and framework. A mechanism is defined as a method or system designed to achieve a specific outcome (Merriam-Webster, 2002). Furthermore, spatiality in architecture and interior design is characterised by the enclosure, arrangement, and perception of space, which is additionally defined as a physical enclosure shaped by social practices, interactions, and the contextual historical environment (Grobler & Le Roux, 2006; Verrest & Post, 2007). Therefore, a spatial mechanism can be defined as a system or process that generates space, featuring a synthesis of many activities derived from everyday practices and the contextual environment. This study examines the spatial mechanism of income generation through a multidimensional integration of economic, political, social, cultural, and environmental aspects, which involves the creation of space within houses and neighbourhoods to facilitate income generation.

Houses and their neighbourhoods have been the focus of extensive study as environments for living, accommodating, and reproduction. In many parts of the world, dwellings are also places of production, where all or some family members work on income-generating jobs from small-scale, part-time chores with low space requirements to large-scale production activities that dominate the surrounding environment (Kellett & Tipple, 2000). Using homes and adjacent environments as workspaces for income generation is prevalent, particularly in low-income areas (Verrest & Post, 2007). Moreover, this source indicates that the fundamental concept of deriving earnings from the residence and its vicinity is influenced by the physical characteristics of the local environment and the spatial arrangement, which can generate employment and convert the house into a multifunctional place. Additionally, it was emphasised that a fundamental attribute of the home as an income-generating space is its adaptability, the ability to fulfil diverse purposes

that might shift throughout the day, over many days, and by season. The literature mentioned above defines income-generation space as an area utilised for various income-producing activities, characterised by limited spatial resources and a flexible, multifunctional layout that facilitates job creation within residential environments, particularly in low-income regions.

This study aims to examine the spatial patterns created by the activities of oyster seekers and their daily income-generating practices. However, the spatial dynamics of the interactions between humans, oysters, and the coastal environment that facilitates income generation for oyster-seeking communities remain inadequately analysed thoroughly. This study conducted a spatial and cultural analysis of the micro-economic activities that contribute to the income generation of the oyster seeker community. The findings from this research indicate that the activities of cultivating, searching, processing, and selling oysters in Alue Naga create spatial networks interconnected with the surrounding environmental conditions, including land and water, the interplay of time and domestic space, and the collective processes of the local community.

METHODS

Map of Locations Associated with Oyster Seekers in Alue Naga



Figure 1. Map of locations associated with oyster seekers in Alue Naga
(Source: Authors, 2024)

This paper employs a design-driven research method, that is a qualitative approach influenced by design thinking, spatial awareness, and an extensive comprehension of architectural principles. This method entails determining and clarifying the diverse variables that influence the issue at hand, thereby facilitating a more nuanced analysis of the problem to be addressed (Blessing & Chakrabarti, 2009; Groat & Wang, 2013). This methodology integrates on-site observations and visualisations as fundamental research instruments alongside direct engagements

with design users within the architectural field, addressing various activities, societal, and environmental concerns (Borrego et al., 2023; Shah & Muro, 2023).

The investigation conducted in Alue Naga, Syiah Kuala District, Banda Aceh, Indonesia (Figure 1). The chosen area highlights the study site, recognised for its prominence in oyster production. It features various activities that create a spatial framework to generate income for the community engaged in oyster harvesting. This area exemplifies an urban environment characterised by diverse environmental conditions and sociocultural dynamics that play a crucial role in the economic activities of the local community.

In this study, the Design-Driven Research method is utilised to interpret and analyse design (Borrego et al., 2023), or in this specific case, how the spatial dynamics are expressed in the income generation of oyster seekers in Alue Naga, Banda Aceh. This study involved spatial observations and field surveys at the sites of income-generating activities, identified through externally visible operations. This spatial observation aims to analyse diverse spatial practices and their apparent or concealed boundaries. It facilitates a more nuanced understanding of human engagement, an intimate perspective of the spatial environment, and conducting interviews with participants to acquire information (Kellett & Tipple, 2003). In addition, interviews were also conducted with respondents involved in oyster income generation to collect further insight on their utilisation spaces and spatial experiences. The interview process involved 30 respondents selected as samples representing each area of the oyster seeker's income-generating activities in Alue Naga.



Figure 2. Image of the research location, Alue Naga
(Source: Authors, 2024)

This site encompasses land areas, including public facilities, shared buildings, housing, other supporting structures, and water areas like reservoirs, rivers, and the sea. These elements are essential to the daily activities and routines of the Alue Naga community (Figure 2). The spatial experience was investigated through observations, field surveys, and

interviews with oyster seeker respondents. The investigation process documented essential components, including oral narratives, photographic documentation, field notes, sketches, and architectural drawings.

RESULT AND DISCUSSIONS

The observations, surveys, and interviews conducted with the oyster-seeking community in Alue Naga identified three primary spatial mechanisms involved in the income generation process for oyster seekers, mainly related to the harvesting, processing, and selling of oysters to support daily domestic activities. First, spatial mechanisms are established in the income-generating process by leveraging local environmental conditions in land and water border areas. Second, is utilising domestic time and space to develop an income-generating process. The third finding, examining social dimensions, indicates that spatial mechanisms are formed through the processes cultivated within the community. Social ties provide spatial mechanisms linked to intimacy that create income-generating spaces. The subsequent sections will delineate the three findings.

The utilisation of land and water border areas to create spaces for income-generating processes

The spatial mechanism facilitating income generation for oyster seekers in Alue Naga involves activities in land and water border areas, consist of rivers, reservoirs, and lagoons. This mechanism was observed at multiple sites, including the Alue Naga Reservoir, the Krueng Lamnyong River (both connected to the Kuala Alue Naga Sea), and the lagoon behind the Alue Naga oyster processing house (which is linked to the sea via Kuala Gigieng). These areas facilitate oyster habitats through various developmental stages (gamete, embryo, larva, spat, adult) in brackish water, a mixture of saltwater and freshwater. Such environments exist in diverse habitats, including freshwater and saltwater marshes, open water, and coastal areas or sandy beaches. (McFarland et al., 2022; mcny.org, 2024), exemplified by the reservoirs, rivers, and lagoons of Alue Naga. The local oyster farmers share this understanding, asserting that oysters flourish in a blend of both water types and will perish if one kind prevails. Consequently, the oyster farming community engages in various activities within these areas to generate income through cultivation practices, searching for oysters, storing oyster farming equipment, and selling oysters, thereby developing specific spaces and mechanisms.

Before establishing the reservoir, Alue Naga communities engaged in foraging for oysters that adhered naturally to rocks and wood in the intertidal

zones of coastal and brackish river environments. The land and water borders, mainly the interstitial rocks, function as barriers that establish habitats for oyster attachment and delineate zones for traditional oyster harvesting by oystermen. The Alue Naga reservoir, located at the intersection of land and water, is presently utilised for oyster farming and storing supporting equipment. The local community conducts the oyster farming process in Alue Naga in the reservoir and lagoon behind the Oyster Processing House. The Alue Naga reservoir, constructed after the 2004 Aceh Earthquake and Tsunami, has become the primary location for the community to harvest oysters as a source of income. Observations at the reservoir (Figure 3) reveal cultivation plots, some irregularly shaped, constructed from bamboo or uPVC pipes that are affixed and dispersed, interconnected by ropes with old tyres hanging between them, serving as the medium for attaching spat (oyster seeds).



Figure 3. The Alue Naga Reservoir

(Source: Authors, 2024)

These cultivation plots represent a spatially organised economic asset for oyster cultivators. The oyster farmers possess designated cultivation plots within the reservoir, where the cultivation procedure is executed by entering and submerging in the water to collect and harvest the oysters. Following the collection of oysters, the mechanism persists; the oyster-harvesting farmers transport the oysters in buckets or burlap sacks to their residences via motorcycle or by walking, where they are shucked at home, or some shuck them in the vicinity of the water canal close to the reservoir. The canal next to the pathway bordering the reservoir serves as a land and water border utilised by oyster harvesters to accumulate shucked oyster shells, which they assert would subsequently develop into future oyster seeds (Figure 4). In addition to serving as a location for shucking oysters, the surrounding land area (reservoir, lagoon, and river) is a storage site for oyster farming equipment. Adjacent to the reservoir, one can witness the equipment employed for oyster farming by this community, including stacks of bamboo and discarded tyres (Figure 5).

Furthermore, in the courtyard of the oyster seeker's residence next to the lagoon, a private storage facility for oyster farming equipment, encompassing nets, used tyres, ropes, and oyster collection containers exists. Oyster cultivators employ unoccupied spaces near water bodies to store oyster farming equipment, including vacant ground surrounding reservoirs and residential yards. The proximity to oyster farming areas facilitates oystermen's installation and utilisation of equipment, hence minimising transit expenses. This spatial mechanism represents an effort by oystermen to utilise the adjacent vacant land and reduce expenditures in the oyster cultivating process.



Figure 4. Accumulate shucked oyster shells in the canal
(Source: Authors, 2024)



Figure 5. Stacks of bamboo and discarded tyres in the vacant area and courtyard
(Source: Authors, 2024)

The oyster-harvesting community employs the border between land and water to sell oyster items. Along the Krueng Lamnyong River are rows of oyster sellers' shacks directly facing the road (Tanggul Krueng Lamnyong Street) and the river (Figure 6 and Figure 7). The oyster vendors at this site have been residing and conducting business here for around 5 to 8 years following the tsunami. The oyster sellers' shacks are informal buildings along the riverside road. The oyster vendors find this region strategically significant since it is right next to the main road (Laksamana Malahayati Street), providing easy customer access. This pertains to urban informality as a production mode, where informal settlements comprise aligned commercial spaces and dwellings along streets, evolving into incremental expansion areas that transform into economic activity zones sustaining daily life (Dovey et al., 2021). The oyster sellers' shacks are organised into two distinct areas: a living space at the back, which

overlooks a small river used for daily activities, and a front area designated for selling oysters. The offerings available for purchase are oysters contained in transparent plastic filled with water alongside various shellfish species.

Map of Oyster Sellers Shacks and The Surrounding Areas



Figure 6. Map of oyster sellers' shacks and the surrounding areas in Alue Naga
(Source: Author, 2024)



Figure 7. The oyster sellers' shacks in Alue Naga
(Source: Authors, 2024)

The commodities are organised on basic selling tables built from wood or concrete (Figure 7). The purchasers typically operate motorcycles and cars, parking their vehicles alongside the road or halting briefly to acquire items directly from their motorcycles, completing transactions without disembarking due to the selling space's proximity to the road's edge. The site directly across from the river is utilised by certain oyster vendors for the cultivation of oysters and for storing excess stock in containers soaked in river water (Figure 8), which enables the oysters to remain viable for resale the following day. A seller explained that the river area serves as an extra space where the water conditions are ideal for oyster habitats, thereby extending the shelf life of unsold oysters and mussels. The area between land and water serves as a spatial mechanism for oyster cultivators, facilitating the cultivation of oysters, providing space for storing cultivation equipment, and allowing for the sale and storage of unsold oysters.



Figure 8. The river is utilised for the cultivation and storing of surplus oysters (Source: Authors, 2024)

The use of time and domestic space as components in the income-generating process



Figure 9. Delivering the oysters to their homes by walking or riding a motorcycle (Source: Authors, 2024)

The spatial mechanisms that generate income in Alue Naga are also reflected in the daily routines of oyster seekers and their domestic spaces, serving as a vital component of this community. The oyster farmers in Alue Naga closely schedule their activities for searching and cultivating oysters in alignment with the patterns of high and low tides. Oysters are typically gathered during low tide, either in the morning or afternoon. Subsequently, as the tide began to rise, they would pull over and transport the oysters to their homes in burlap, nets, or buckets for shucking. They typically deliver the oysters to their homes by walking or riding a motorcycle with buckets of oysters on their heads, which takes less time because most oyster seekers' homes are near the aquaculture reservoirs (Figure 9).

The specified timings dictate the following tasks that will be conducted by the oystermen on that day. Some oyster harvesters claim they can determine subsequent income-generating activities after estimating the tide conditions and completing the oyster collection. Oyster picking occurs in the morning, followed by oyster shucking, which will be done about midday, contingent upon the quantity of oysters

gathered. If the oyster harvesting commences in the afternoon at low tide, the oyster gatherers will shuck the oysters the following day. Several oyster harvesters engage in this activity nearly every day. However, several of them, particularly women, stated that their oyster harvesting schedule is altered based on the time available in their household. Moreover, according to interviews with several members of the oyster-seeking community, the highest oyster sales typically occur during Ramadan (fasting month), intensifying the activity of searching, shucking, and selling oysters.



Figure 10. Oysters are shucked in the outdoor area of the house or the alleyways (Source: Authors, 2024)

In addition, spatial strategies have been developed by oyster harvesters in Alue Naga through utilising domestic space to generate income. The spatial domestic strategy is integral to the social and cultural context and should not be disentangled (Yatmo & Atmodiwirjo, 2013). The technique is exemplified in Alue Naga by adapting the dwelling area to process and sell oysters. Therefore, spatial functions are mixed for living and income generation within the oystermen's residences as they process and sell oysters on-site. Oyster processing entails extracting the oysters from their shells and transforming the shucked oysters into various culinary products. The patio or yard area of the house is used for conducting oyster shucking. Oysters sourced from the reservoir are shucked in a spacious outdoor area of the house, designed to accommodate the various necessities of this process (Figure 10). These items include a container or burlap for collecting the shelled oysters, a bucket for clean oysters, and individuals who participate in the shucking, often collaborating as a group.

Cleaning and wrapping the oysters in clear plastic for sale typically takes place at the houses of the oyster seekers. Some stated that clean oysters are stored in the refrigerator, which is also utilised for general household purposes to ensure their longevity before sale. Some individuals also prepare oysters in their home kitchens, transforming them into processed

foods like oyster nuggets and chips. Some oyster seekers utilise their residences as venues for selling oysters, exemplified by oyster-selling shacks that combine living quarters with a sales area (Figure 11). Several stalls were established in front of residences, offering food products derived from oysters (Figure 12). This setting can reduce other expenses, such as renting a facility to process and sell oysters, which can be conducted at home. The spatial arrangement illustrates the integration of space for everyday activities and the owner's economic resources. The allocation of time and domestic space indicates that the spatial mechanism for income generation involves factors such as tidal time and adjustments for family needs. Additionally, income generation is established by utilising domestic space and the dwelling area.



Figure 11. The utilisation of houses as venues for selling oysters and shells
(Source: Authors, 2024)



Figure 12. Stalls were established in front of a house, offering food products (Source: Authors, 2024)

Social aspects as the engine of spatial mechanism to generate income

According to data from the keuchik (village head) office in 2016, Alue Naga has a population of approximately 1,270 people, with 494 households (SIGAP, 2024) interconnected through community ties. Thus, social factors play a crucial part in the daily existence of the oyster-seeking society, serving as an engine for spatial mechanisms that generate money. These features include utilising shared cultivating land without unrestrained plots, marketing oysters through

connections with individuals, and collaboratively engaging in oyster processing operations.



Figure 13. The Alue Naga Reservoir plots for oyster co-cultivation
(Source: Authors, 2024)

In the reservoir owned by Alue Naga Village, a primary site for oyster co-cultivation, some plots exist where oyster farmers utilise bamboo, pipes, and submerged old tyres connected with rope ties as substrates for oyster attachment (Figure 13). Village elders claim that the oyster-harvesting community utilises designated plots as their distinct zones for oyster growth. The agriculture plots in this reservoir do not have any particular signs of ownership. However, the oyster-seeking community had already identified the individual users of each plot and refrained from interfering with one another's plots. This practice has existed since the community shared the reservoir and persists presently. Some oyster harvesters demonstrate that the users of an oyster farming plot typically belong to the same household, such as a husband and wife who both engage in oyster farming or relatives who collaboratively cultivate oysters. Since everyone utilises their own cultivation space, there is no formal sign identifying the oyster growing space in this reservoir. It is primarily because of the relationships formed within the community and the system of knowing one another.

The process of selling the previously collected oysters establishes a spatial mechanism. Some sellers in the oyster selling process trade their oysters by walking door to door or by selling in their shacks. Furthermore, some individuals have gathered oysters but chose not to sell them directly. Instead, they have relied on their networks, including relatives, family, and friends who have connections with potential buyers. The relationship depends on mutual trust, allowing the seller to guarantee the oysters' quality. The sellers typically entrust their items to the shack and transport them in clear plastic bags, then place them in a larger container by motorcycle (Figure 14). Several sellers delivered the items without getting off their motorbikes, placing them directly onto the selling

table space. The selling tables' proximity to the road renders them accessible (Putri & Fadhil, 2023). Several other vendors paused to converse with the owner of the sales kiosk situated in the front yard or terrace area, which featured chairs for interaction. Numerous oyster vendors report that this process occurs nearly daily when the shack proprietor purchases multiple plastic bags of fresh oysters from the depositor and sells them to the consumer. The sellers procure oysters through established partnerships, guaranteeing the quality of the oysters sold and fostering customer loyalty, thus sustaining the oyster sales cycle.



Figure 14. The reselling process of oysters to sellers shacks by motorcycle
(Source: Authors, 2024)

Certain activities are linked to the communal practice of oyster processing, including shucking oysters with other enthusiasts in the houses and nearby locations and collaboratively producing oyster products at the processing facility operated by Alue Naga Village. Interviews with several oyster seekers, predominantly women, indicate that oyster shucking is one of the most time-consuming processes. Therefore, they typically engage in this activity with friends, relatives, or family members. This activity generally occurs in various locations surrounding their houses, including courtyards, terraces and alleyways within the village. The women shuck oysters collaboratively, engaging in conversation that makes the lengthy process seem effortless (Figure 15). This communal oyster shucking space features equipment such as a small chair for seating while shucking oysters, oyster nets, burlap, a bucket of clean oysters, gloves, and a prying knife, with all items arranged on the

ground or road for convenience (Figure 15). The data indicate that social elements, including gathering and conversing during the oyster shucking process, indirectly contribute to creating an external space integral to income generation. This aligns with the concept of urban interiority, which pertains to the process of interiorization, a condition of creating interiors in external spaces (Attiwill, 2011; Harani et al., 2021). This interior condition manifests in urban environments where external areas possess interior characteristics (Atmodiwirjo et al., 2015; Harani et al., 2021).



Figure 15. The women shuck oysters collaboratively
(Source: Authors, 2024)



Figure 16. The Alue Naga Oyster Processing House
(Source: Authors, 2024)

Furthermore, at particular times, oyster processing activities are collaboratively undertaken, highlighting the social dimensions at the Alue Naga Oyster Processing House, officially inaugurated on February 12, 2020. The village's natural resources were formerly utilised through a basic approach, wherein farmers harvested and sold oysters directly. However, with the implementation of technology in this facility, oysters can now be transformed into various processed food products, such as oyster crackers and oyster nuggets, thereby enhancing their market value. The Alue Naga Oyster Processing House is a facility for the local community that facilitates various collaborative activities (Figure 16). These include training sessions on oyster processing conducted by external experts, drying freshly caught oysters, and engaging in collective processing efforts.

The facility comprises multiple structures, including the primary building designated for oyster processing, a spacious drying building, and a smaller one (Figure 17). The oyster processing house, functioning as a communal space, facilitates the community's gathering and collective processing of oyster products. Considering the previously outlined social factors, income-generating opportunities can be established through oyster farming in the reservoir, utilising borderless plots, fostering relationships that facilitate a buying and selling cycle of oysters, and engaging in communal oyster processing activities within residential areas and shared village facilities.



Figure 17. The Oyster Processing House, a drying building
(Source: Authors, 2024)

CONCLUSION

The findings and discussions reveal that income-generating activities in the oyster seeker village of Alue Naga applied through three distinct spatial mechanisms: (1) the utilisation of land and water border areas, (2) the incorporation of time and domestic space as components in the income generation process, and (3) social aspects serving as the engine of the income generation space. The three forms of spatial mechanisms highlight the interconnectedness of all income-generating activities involved in cultivating, collecting, shucking, processing, and selling oysters, which drive income generation.

This paper argues that using land and water border areas represents a spatial strategy employed by the oyster seeker community in Alue Naga to generate income through local environmental resources. The border area between land and water in Alue Naga facilitates spaces for oyster cultivation, equipment storage, and oyster sales, thereby creating a mechanism for income generation for the local community. The findings regarding everyday practices in Alue Naga indicate that utilising time and domestic space contributes to establishing income-generating processes. It involves organising time for the cultivation and sale of oysters, in addition to daily activities. Similarly, the employment of mixed-use

spaces for residential purposes and income generation occurs in the houses of oyster seekers and sellers, which provide additional roles in supporting the economy of their inhabitants. This research indicates that social relations can serve as a source of income, established through collaborative activities, connections with relatives, and the utilisation of communal spaces, highlighting the significance of social factors in the income generation efforts of the oyster-seeking community in Alue Naga. This architectural study reveals that the spatial mechanism is established through the diverse activities of oyster gatherers, who create a network of connections significantly shaped by environmental conditions, integrating the functions of time and domestic space, along with the solid social network of the community.

The findings reveal that the coastal environment can produce spatial mechanisms that form income-generating spaces for coastal communities, which should be considered when designing urban areas. Particularly for the oyster-seeking community and sellers with specific spatial requirements in an urban setting, where the social dynamics between the community and its surroundings are well-defined. This realisation could facilitate a design framework that reinforces the community's economy. For example, the spatial mechanism of income generation space in Alue Naga oyster seeker community could potentially be incorporated into the Regional Spatial Plan (RTRW) of Banda Aceh to ensure that the mechanism operates effectively and efficiently. Therefore, optimising the income of the oystermen. Further studies are required, including a more detailed exploration of architectural and interior spatial studies on each income-generating activity of the oyster-seeking community and developing design recommendations in response to the analysis patterns conducted.

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