Sustainable livelihoods of coastal communities in Karangsari Urban Village, Tuban Regency after settlement improvements

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Abstract. Karangsari Urban Village's growing population density and scarcity of land contribute to the development of slum communities. The government is making an effort to enhance settlements. However, it is unknown if the settlement improvements would result in the people achieving sustainable livelihoods. This research aims to assess the current status of community-owned livelihood assets and their sustainability. To define the circumstances of natural capital, physical capital, human capital, financial capital, and social capital in the study area, one must first characterize the conditions of natural capital, physical capital, human capital, financial capital, and social capital. A closed questionnaire and observation were used to gather primary data. The analysis used descriptive and qualitative descriptive statistical techniques. The findings indicated that the community's natural capital, physical capital, human capital, financial capital, and social capital are not sustainable.

1. Introduction

The pattern of human activity and the influence of environmental factors, both physical and non-physical, directly affect the pattern of activities in the region [1]. Humans inhabit coastal settlements in an area with all the facilities and infrastructure necessary to support the population's life. They are located on land areas, including those inundated with water and those that are not, but still influenced by marine processes [2].

Three primary requirements must be fulfilled when coastal people occupy their land [3]. These include the need for housing that is resistant to natural disturbances, a location to satisfy necessities day by day, and a location that satisfies basic human requirements [3]. According to Wesnawa [4], most coastal communities are unsustainable and have developed into slums; this is evident in the small size of the house yard, the lack of sanitation, and the misalignment and incompleteness of supporting facilities, particularly the layout of fishing equipment. However, the various efforts made by the current government to manage slum settlements remain ineffective due to the lack of effective communication [5]. Additionally, there are weaknesses in several areas that have been performing well, a notable consistency in executing sustainable phases [6]. Moreover, another research mentioned that the regional budget resources are still insufficient, and therefore they are still awaiting the central government's budget via the APBN (State Budget) [7]. Furthermore, there are concerns about the poor's limited
involvement in creating BKM (Community Self-Sufficiency Agency) and the high proportion of BKM members who are not impoverished [8].

The idea of sustainable livelihoods encompasses all concerned with people and the means through which sustainable development may be implemented [9]. Morse defines sustainable livelihoods as "the process through which sustainable development may be brought to a community under a variety of circumstances and in any location" [10]. In practice, sustainable livelihoods theory is beneficial for tracking changes in livelihood strategies over time and determining which events and influences have been and will continue to generate new values, orientations, and livelihood strategies in society [11, 12]. Moreover, approaches based on the idea of sustainable livelihoods are robust in terms of their scope and applicability since they can be used in nearly all development settings, and perhaps more, as they are still fundamentally about livelihoods [13].

The value of livelihood assets varies according to the community’s total capital, including human capital, social capital, natural capital, physical capital, and financial capital [12, 14-20]. The asset pentagon describes the many connections and interrelationships between these components of livelihood resources [21]. The shape of a pentagon and the lines that link them to a central point in the pentagon shows the differences in resource ownership and community access [20]. Human capital reflects an individual's capacity to improve their living circumstances [22]. Human capital is the most critical capital in livelihood because it allows individuals to execute livelihood strategies and accomplish livelihood objectives. It is required to develop the other four livelihood assets [19]. Natural capital is the natural resources that generate the carrying capacity and value of benefits for human lifestyles. It comprises land resources, including land tenure and land productivity, and natural resources and the environment [12]. Social capital is a valuable and utilized social resource consisting of community organization elements, participation, cooperation, kinship relations, and social networks [19]. Financial capital is defined as the financial resources employed and used by a community to achieve its life objectives. These resources might take the shape of reserves or inventories held by the community or financial institutions, as well as a regular flow of money [20]. Physical capital refers to the basic infrastructure and other facilities that support a community's livelihood processes; these are typically free-of-charge public facilities that include transportation networks, communication networks, vehicles, buildings and residences, sanitation facilities, and access to clean water, energy, and technology [20].

Numerous attempts have been made to organize slum areas, one of which being the KOTAKU program. This initiative seeks to increase access to essential infrastructure and services in urban slum regions to facilitate livable, productive, and sustainable urban settlements [6]. In addition, KOTAKU intends to expedite slum control by enhancing the quality, management, and prevention of future slums via efforts made in villages and regional/urban regions and entities [23].

Karangsari Urban Village is one of Tuban Regency’s coastline regions that has received supports for area development in 2016 under the KOTAKU program. This is because Karangsari Urban Village has a variety of environmental issues, including the most significant rate of construction irregularities among villages at 300 units per hectare, particularly in coastal regions; the practice of discarding the trash in the sea; and unmet bath wash toilet services. As a result, improvements were made in 2018, transforming it from a mild slum to a regular neighborhood. This research sought to assess the quality of the residential environment and the community’s quality of life by observing whether the area development initiatives have led to sustainable livelihoods.

1.1. Research locations
This study was conducted in a community in Tuban District's coastline region, namely Karangsari Urban Village. The state of sustainable livelihood assets and physical settlements is the subject of this study, along with the resources of individuals residing in the regions undergoing settlement development. Karangsari Urban Village is situated on the northwest coast of Tuban Regency and spans 23.63 hectares. The following is a map indicating the site of the research.
1.2. Paradigm of research
This research employs a post-positivism perspective. Post positivism presupposes the existence of an objective reality that can be felt and quantified, such as social and cultural reality [24]—considering that this study does not concentrate only on the physical elements of the environment, but also on non-physical aspects such as social, economic, and cultural factors. Thus, it is feasible to quantify both physical and non-physical elements in the post-positivism paradigm. The researcher's stance is ethical or independent of the subject of observation. This method uses a non-participation observer. The term "non-participation observer" refers to a method of observation in which the observer (or researcher) is not directly engaged in group activities, or the observer does not participate in the activities he observes [25].

1.3. Research Plan
According to the paradigm, a qualitative-quantitative research approach was employed. Creswell describes mixed or combined techniques as a study in which the researchers gather and evaluate data, synthesize results, and make conclusions concurrently utilizing two quantitative and qualitative approaches to address issues in a single research activity [26].

1.4. Data collection and sampling techniques
The sampling strategy used in this research is simple random sampling, specifically of individuals living in post-slum settlement regions with an enhanced physical environment. The community in issue is the people who have lived there since their living setting is still classified as a slum settlement until it is reclassified as a non-slum settlement. With 831 houses in Karangsari Urban Village, the sample size was 91 families using Slovin’s formula. Primary data collection was used in this research, using questionnaires and field observations. Then, field observations were conducted to ascertain the current state of the study area.

1.5. Variable for research
This research focuses on five indices of livelihoods linked with settlements: natural capital, physical capital, human capital, financial capital, and social capital. Before evaluating the questionnaire's
findings, it is essential to determine the questionnaire's validity and reliability. Sugiyono (2014) and Yusuf (2016) state that the validity test is used to evaluate the degree of validity of the questionnaire instrument used to gather data [25]. Further, the validity test is used to verify whether the test items in the questionnaire accurately express the subject matter being researched. At the same time, the purpose of the reliability test is to evaluate the degree to which an instrument can be trusted to gather data [25].

The gathered surveys were then examined for interpretation using descriptive statistical analysis techniques. Apart from the questionnaire findings, the researchers conducted a firsthand observation.

2. Results and Discussion
The researchers initially evaluated the validity and reliability of the questionnaires using the SPSS software. The validity test was conducted using the estimated r-value as an input. The variable is considered valid if the computed r-value is greater than the table r-value. The table r-value for samples is 91 with a 5% significance level of 0.207. The computed r-value for each item is shown with an ** in the total column. Each number in that column is more than 0.207.

| Case Processing Summary | Reliability Statistics |
|-------------------------|------------------------|
| **Cases**               | **Cronbach's Alpha**    |
| Valid                   | .751                   |
| Excluded<sup>a</sup>    |                       |
| Total                   | 91                     |
|                         | 100.0                  |
|                         | 42                     |

*Figure 2. Case processing summary
Source: Analysis, 2021.*

Then, using the SPSS software again, a reliability test was conducted. As seen in the Case Processing Summary table above, cases are valid for all respondents (91) or 100%, inferring that nothing is excluded (as shown in Excluded<sup>a</sup>). In addition, the Cronbach's Alpha column in the Reliability Statistics table indicates that there are 42 items per questionnaire and shows a value of 0.751, which is greater than 0.6, indicating that all questions in the questionnaire are trustworthy or consistent.

2.1. Identification of natural capital
Natural capital comprises the availability of water supplies, the current state of land usage, and the placement of dwellings along the coastline boundary. Based on the results of field data analysis, groundwater is the primary source of clean water in Karangsari Urban Village, while spring water from PDAM channels is used for the remainder. While most private properties are idle, some households utilize it to support livelihoods—as collectors do—by constructing a structure to keep fisherman's catch and the remainder for everyday necessities, such as drying clothing. Settlements are often located more than 30 meters from the shore. However, several buildings retain a gap of 0–10 m.

2.2. Identification of physical capital
Physical capital consists of ownership and tenancy conditions, ownership of livelihood-supporting production equipment, the availability of housing infrastructure and amenities, and public transports. According to field data analysis, ownership and housing circumstances are mainly legal and decent in the research region. Ninety-five percent of people possess the production equipment to support their everyday livelihoods, while 5% do not. The production equipment is reasonably varied, including nets, boats, smoking apparatus for fish, and other instruments. Electricity has been delivered to all residences with varying degrees of electrical power, with a maximum of 45% in 450 watts. Then, when it comes to access to environmental roadways, just 26% have direct access to roads with a width greater than 1.5 m, with the majority of residential buildings facing roads with a width less than 1.5 m, and the remainder of residential structures do not face the road directly. Certain neighborhood roads exist due to a lack of funding for road repairs in the form of asphalt installations. Ninety-three percent already have a closed
drainage system when it comes to drainage channels, while 2% have open drainage and 5% lack drainage.

Following that, let us consider the supply of safe drinking water and the availability of necessary infrastructure. As previously stated, most people continue to rely on groundwater, with 79% using drilled wells or pump wells and just 21% using piped meters. For solid waste management, the majority of waste areas (58%) are disposed of immediately in the closest community transfer station, which is sometimes situated in the administrative territory of another urban village; 25% are thrown into the beach or burnt; and just 18% contain personal garbage. In regard to trash transportation, 75% occurs more than twice a week, 14% occurs more often than once a week, and 7% occurs once or less frequently than once a week. After that, there is a question about the availability of a wastewater management system. Forty-four percent of individuals already have a private septic tank, 33% use a community septic tank, and 23% do not have one. Because the homes without septic tanks are often located immediately next to the beach, they prefer to dump their effluent straight into the beach.

The availability of facilities for places of worship in the research region is adjacent to the residential areas. Similarly, educational facilities, service trade infrastructure, and TPI (Fish Auction Place) are also examples of such amenities. There is an available green open space in the form of a playground, a part of the pre-primary school building. Parks are not available, and as a result, people gravitate toward parks located near the residential areas. The park is located in another subdistrict's administrative jurisdiction, immediately close to the research area.

2.3. Identification of human capital

Human capital consists of an individual's education level, the number of households and family members, and their skills—whether or not they are related to their livelihood. According to the data, most of the people living in the research region have completed elementary school (33%), and just 5% have completed a college degree. For skills, 30% of the community can build fishing nets, which are then utilized to support their daily lifestyles, with the addition of a variety of other talents, such as baking bread, selling processed seafood, and an assortment of other abilities. However, 26% of the population lack skills.

Sixty-two percent have a family with 2–3 members, while the remaining percentage have a family of 4–5 people. Thus, in terms of the number of households per home, 55% are inhabited by a single household and 45% by 4–5 families, which—based on observations—is due to the father or mother residing at their child's residence.

2.4. Identification of financial capital

Economic capital comprises employment, private vehicle ownership to facilitate daily work, income and savings, and formal and informal financial institutions. Based on the field data analysis results, 47% of individuals work as fishermen, 23% work for private businesses, 3% are unemployed, and the remainder work in various other professions. In addition, 92% of individuals possess a private vehicle in terms of car ownership, whereas 8% do not. In terms of income, 55% of the population spend 75–100 percent of their income for daily requirements, 43% spend 50–75 percent, and just 2% spend 0-25 percent on daily needs. In terms of savings, most individuals do not have any, accounting for 81% of all respondents. The average response for formal financial institutions is that they are not accessible in the urban village. However, 4% said they are available in the urban village, and 1% responded that they are available near their residence. The only formal financial institutions in Karangsari Urban Village are waqf banks. Forty-six percent said informal financial institutions are accessible outside the urban village, 45% mentioned they were available inside the urban village region, and 9% commented that they are available near their residence. The PKK gathering is one of the various informal financial institutions described in RT 002/RW 003.
2.5. Identification of social capital

The presence of social institutions, fishing communities, and community involvement in social activities, community service, and culture all constitute social capital. The following describes the present state of the research field based on the findings of the questionnaire.

According to the findings of field data analysis, 96% of respondents said that community social institutions are accessible in the urban village, but only 4% pointed out that they were available and near their residence. PKK (Family Welfare Empowerment), BKM (Community Self-Sufficiency Agency), and the Dasawisma group are only a few of the social institutions in Karangsari Urban Village. Each RT has its fishing community based on the type of boat used for fisheries. Regarding the people’s involvement in social activities, 48% acknowledged that they did not participate, while the remainder mentioned that they did follow the established social activity schedule. Eighty percent of the respondents have engaged in community service, while the 20% have not yet been actively involved in their surroundings. Finally, 80% asserted that they did so when asked about cultural activities, while the remaining 20% did not.

2.6. Evaluation of the community's sustainability of livelihoods after area development

Despite the region's development, natural capital in the research area faces constraints due to land scarcity. Due to limited land, individuals tend to utilize the existing lands without regard for their legality, one example being the construction of structures that are still part of homes situated on the beaches without authorization. Because the structures constructed did not have access to clean water, people opted to utilize groundwater as their water source, even though the groundwater was not suitable for a clean water supply.

Following that, physical capital will now be discussed here. In terms of ownership and legality, the existing homes were in good shape and were accompanied by an ownership certificate. Additionally, the existing homes have access to the power grid. Furthermore, religious facilities, service trade facilities, a fish auction location, health care facilities, and educational institutions were within proximity. However, Karangsari Urban Village continues to face a challenge concerning its educational resources, which is the lack of public primary schools. Due to the limited space available, Karangsari Urban Village also lacks a public park, and inhabitants often resort to the parks situated in the administrative territory of another urban village or playgrounds that are part of the amenities of a pre-primary school.

Another issue with physical capital in Karangsari Urban Village is that certain sections still lack proper drainage. The people here prefer to make use of the drilled or pumped wells—rather than water metering—for clean water supplies derived from groundwater as a part of their natural capital. Additionally, the current clean water pipe does not provide service to all of Karangsari Urban Village's residents. Another issue is that some homes still lack septic tanks and opt to dump wastewater straight into the sea. Along with discharging wastewater into the sea, the unresolved issue of waste management further encourages individuals to toss their trash straight into the sea, polluting the marine environment and reducing fishermen's catch.

This part now discusses human capital. The majority of residents are elementary school graduates whose average income is generated from fishing. Thus, society as a whole has adequate abilities to sustain everyday labor. However, there are still those individuals who lack the necessary abilities. One reason why this issue persists, despite official training, is that there are still individuals with poor literacy levels.

Then, there is the issue of economic capital. Though the majority of individuals already have occupations that are a good fit for their abilities, the primary issue lies in the severely restricted public access to official and informal financial institutions. Additionally, inadequate knowledge of savings results in other difficulties, such as borrowing from moneylenders at exorbitant interest rates, making it impossible for individuals to pay them back.

Lastly, this study will shed a light on social capital. Although community engagement is pronounced in Karangsari Urban Village, some residents remain apathetic to community service programs and
cultural events in their neighborhoods. It is undeniable that the community's active participation is necessary, particularly in community service activities, since the aim of community service is to build a liveable environment.

3. Conclusion
With the aforementioned conditions, it is reasonable to conclude that Karangsari Urban Village is unsustainable in terms of natural capital, physical capital, human capital, economic capital, and social capital. According to the arguments above, there are changes in the motivation of the residential environment in the Karangsari Urban Village area as a result of efforts to improve slum settlements, such as the construction of closed drainage and road pavements, which make it easier for people to transport marine catches and reduce inundation around their homes. Additionally, the community has recognized the need for community service activities to maintain a better environment. Social institutions, such as PKK and Dasawisma, tahlib congregations, fishing communities, and the presence of BKM as an agency that collaborates directly with KOTAKU, are very active in Karangsari Urban Village. Furthermore, BKM Pantura, an organization established to help residents of Karangsari Urban Village, offers a creative focus on dealing with community issues.

However, there are still some issues that remain, such as the people’s water sources that continue to utilize groundwater, despite being often located near septic tanks and in low quality. Land issues continue to pose a significant issue in Karangsari Urban Village, owing to the area's high density of structures and the presence of a culture of permanence. This scarcity of land also affects the provision of adequate residential infrastructures, such as the lack of land for storing nets, limited educational facilities, the absence of a park for residents to gather, the absence of a final waste disposal site administered by Karangsari Urban Village, and the community's condition. Roads and the availability of pipes and drainage channels remain troublesome. Additionally, community members who continue to litter and certain individuals who remain oblivious to activities taking place in their surroundings contribute to the sequence of issues in Karangsari Urban Village.

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