Livelihoods sustainability pattern in Sangrawayang Village, Simpenan District, Sukabumi Regency

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Abstract. Season changes influenced the fishers’ job. Their economic life is not stable. Therefore, fishers in Indonesia, especially in Java Island, also cultivate the land. Whenever their area has good access, they have more than two types of job. Sanggrawayang village in Sukabumi District is a fishing village whose fishers earn its income from farming as well. Since 2016, dwellers also have begun working in the service sector, namely services related to tourism activities. This study tries to find out the fishing activities sustainability by using Sustainability Livelihood Approach. By conducting semi-structured interviews with 20 fishers, we can classify the fishermen into three groups, namely fisher laborers, individual fishers, and fishers that own business. Most of the residents are labor fishermen. The result showed that with limited financial and working capital, laborers had more types of work. Their strategy to maintain fishers’ activities is by developing themselves in the services field, both related to fishermen and agricultural activities, as well as in the tourism sector. While fishery business owner who have high financial capital, significant working capital, and extensive networks, are more focused on working in the fishermen sector. Expansion of work in fishermen is carried out by business owner by renting boats and expanding fishing activities by acting as a middle person and distributors as well. The government program is needed to maintain the fishermen smallholder livelihood. This program is designed to be in line with the culture of fishers in Sukabumi.

1. Introduction
The life of fishermen are greatly influenced by seasonal changes [1]. In Indonesia, fishermen must reduce their fishing activities during the western Monsoon season. At that time, the wind blows hard and can cause disturbing fishing activities. When the wind blows from the east, they can freely go to sea and get a large amount of catch. As fishers, their income is not stable. Because it is normal if fishermen have other jobs [2]. Another job that is usually done by fishermen is cultivating the land. Besides fishing, fishermen also farm. In some areas, fishermen also trade. Even since 2016, fishermen in Sangrawayang Village also work in the tourism sector.

Various work carried out by fishers that aims to maintain their quality of life happened in several villages [3]. This situation also happened in Sanggrawayang Village. At present fishermen do not live as only. Livelihood is defined as a strategy to make a living, through efforts made by utilizing various resources that are owned to get income to maintain survival [4]. In this study, the research objective is the pattern of fishermen's sustainability in Sangrawayang Village, Sukabumi Regency, using the Sustainable Livelihoods approach.
Livelihoods are strategies for making a living, which are various attempts made by someone to use the various resources they need to get the improvement they can maintain for their survival [4]. SLA is a method to measure the power possessed by individuals or communities to maintain their livelihoods [5,6]. This method also analyzes the strategies undertaken so that the source of livelihoods can continue. Livelihood approach places people at the center of its environment [6]. Opinions are built based on the opinions or meanings of the community about the estimates and the opportunities they have. This method discusses the way individuals, in this case, use specific social, economic and physical assets to seek further, reduce risk, reduce increase and increase or increase their livelihoods [7].

2. Methodology

Research on the Sustainable Livelihoods Approach always involves human capital assets, natural capital, social capital, financial capital, and physical capital [5,7]. In this study there are two main objectives for which the answer is sought, the first is about the pattern of sustainability of fishermen's livelihoods in Sangrawayang Village, Simpenan Regency, using SLA (Sustainable Livelihoods Approach), and the second is to find out how fishermen manage their resources through strategy. In the first objective, the study was conducted by analyzing the sustainability of fishermen livelihoods based on five SLA capital. In the second objective, the study was conducted by analyzing the economic strategy of fishermen based on the assets they have.

Data needed for this research are primary and secondary data. Secondary data obtained from related institutions or agencies namely the Department of Maritime Affairs and Fisheries. While primary data were obtained from Sangrawayang village fisherman, primary data were collected through semi-structured interviews with 20 fishermen. In addition to interviews, primary data were also obtained from observations in the field. The factor observed was social and economic relations between the fishermen and village officials. Observations were also made to identify the roles of each fishing activity stakeholder in this village.

Primary data obtained from interviews with fishermen in Sangrawayang Village were conducted by using the snowball technique. In addition to interviews the research, data were obtained by observation. Keywords from verbatim results that based on the in-depth interviews with fishermen are processed. The outcome showed assets that possessed by fishermen. Asset valuation is done to see the asset allocation from each fishery classification [8].

| Table 1. The difference of Fishermen Groups based on Economic Strategies |
|---------------------------------------------------------------|
| Asset Type         | Asset Form                  | Score |
| Natural Assets     | Fishery                     | 0-1   |
|                    | Agriculture                 | 0-1   |
|                    | Coastal Ecosystem           | 0-1   |
| Social Assets      | Social Network              | 0-1   |
|                    | Resource Processing System  | 0-1   |
| Human Assets       | Fisherman Skills            | 0-1   |
|                    | Health Guarantee            | 0-1   |
| Financial Assets   | Income                      | 0-1   |
|                    | Savings                     | 0-1   |
| Physical Assets    | Boat                        | 0-1   |
|                    | Bagan                       | 0-1   |
|                    | Salted Processing           | 0-1   |

0 = do not have access, 1 = have access
Researchers make livelihood categories as fishermen based on asset ownership. Assets were obtained from interviews with 20 informants. The selection of informants is carried out based on information from a key informant, namely the head of the hamlet. In this study, the snowball method is considered appropriate because it can obtain informants that fit the criteria according to the opinions of fishermen.

Data on ownership of assets are entitled to weights. This weighting is done based on the keywords conveyed by the informant. Weight 1 is given to fishermen who have assets and weight 0 if fishermen do not have these assets. After processing the asset data, the researchers then also developed a fishermen economic strategy in using these assets. The identification is based on a strategy. As for the developed economic strategy, a) The role of fishermen in the community, b) Diversification of livelihoods, c) Social networks, d) Potential for development and e) The use of technology.

The analytical method used to carry out the objective in determining the sustainability of livelihoods is the sustainability livelihood approach. In applying this method, livelihood sustainability is carried out based on asset ownership. The results of this analysis are presented in the form of images or graphics. Descriptive qualitative spatial analysis is performed by showing the spatial differences in the role of fishermen who are categorized based on fishermen's economic strategy and also classification based on asset ownership. The results of the analysis show that fishermen can be categorized as labor fishermen, individual fishermen, and skipper fishermen.

3. Discussion
In classifying fishermen in Sangrawayang Village, Simpenan Subdistrict, Sukabumi District, researchers categorized fishermen with the terms of ownership of assets [8]. 1. Fisherman laborers: a) Don't have a boat, b) Work as a fishing laborer; 2. Individual Fishermen: a) Owns a Ship, b) Employs other fisherman workers, c) He also works as a fishermen; 3. Skipper fishermen: a) Have a Ship, b) Hire Other Fishermen Workers, c) He/She does not work as a fisherman.

![Diagram of Number Fishermen based on Boat Ownership](image)

In the interview, the Chairperson of the Sangrawayang Village Fishermen Group explained that almost 50% of the fishermen in the Sangrawayang Village were labor fishermen. That is why most of the informants are labors. Meanwhile, there are three skipper fishermen as informants, and the remaining 48.2% were individual fishermen.

Based on Table 2 and Figure 2. The results of the analysis show a total score of 6 with a score range of 0-14. These results indicate that labor fishermen have minimal assets. According to Figure 2, fishermen mostly have human and financial assets. This finding shows the level of difference in ownership of fishermen's assets is not significant. The least assets that own by fishermen are physical and social assets. Labor fishermen usually have skills, formal education, and health insurance. This shows that their human assets are quite high. The findings of this study do not match the previous studies. In previous
studies, workers found it difficult to get out of the trap of low poverty because their low human assets [9].

Table 2. Labor Fishermen Assets for Sustainable Livelihood

| Asset Type       | Asset Form          | Score |
|------------------|---------------------|-------|
| Natural Assets   | Fishery             | 1     |
|                  | Agriculture         | 1     |
|                  | Coastal Ecosystem   | 1     |
| Social Assets    | Social Network      | 0     |
| Social Assets    | Resource Processing System | 0     |
| Social Assets    | Formal Education    | 1     |
| Human Assets     | Fisherman Skills    | 1     |
|                  | Health Guarantee    | 1     |
| Financial Assets | Income              | 1     |
| Physical Assets  | Boat                | 0     |
|                  | Bagan               | 0     |
|                  | Salted Processing   | 0     |

0 = do not have access, 1 = have access

The analysis at Table 3 and Figure 3 shows that individual fishermen have a total score of 11 with a score range of 0-14. These results indicate that individual fishermen have high assets. Individual fishermen spend their time mostly as fishermen. Beside managing their own boat, once in a while they also work as labors or work in other sectors. The biggest assets are physical and financial assets, and the lowest assets are social assets. Social assets include social networks, systems process resources.

Table 3. Skipper Fishermen Assets for Sustainable Livelihood

| Asset Type       | Asset Form          | Score |
|------------------|---------------------|-------|
| Natural Assets   | Fishery             | 1     |
|                  | Agriculture         | 1     |
|                  | Coastal Ecosystem   | 1     |
| Social Assets    | Social Network      | 1     |
| Social Assets    | Resource Processing System | 1     |
| Social Assets    | Formal Education    | 1     |
| Human Assets     | Fisherman Skills    | 1     |
|                  | Health Guarantee    | 1     |
| Financial Assets | Income              | 1     |
| Physical Assets  | Government Assistance Projects | 0     |
| Physical Assets  | Boat                | 0     |
|                  | Bagan               | 0     |
|                  | Salted Processing   | 0     |

The results of the analysis at Table 4 and Figure 4 show that skipper fishermen have a total score of 14. These results indicate skipper fishermen have the highest assets among all categories of fishermen. This result shows that skipper fishermen have the best livelihood sustainability.
Table 4. The difference of Fishermen Groups based on Economic Strategies

| Economic Strategies form | Labor Fishermen | Individual Fishermen | Skipper Fishermen |
|--------------------------|-----------------|----------------------|-------------------|
| The Role of Fisherman Members | ✓               | ✓                    | ✓                 |
| Fishermen Diversification | ✓              | ✓                    | ✓                 |
| Social network            |                 |                      | ✓                 |
| Migration                 | ✓              |                      |                   |
| Using technology          |                 |                      |                   |

Table 4 presents fishermen information by category, in carrying out economic strategies. The economic strategy that must be carried out by fishermen is work diversification. The economic strategy must be carried out considering that fish catching activities are unstable, depend on the seasonal factors. During the monsoon season, fishermen usually carry out agricultural activities to meet their needs. Fishermen in this village do not use the latest technology. To catch fish in the fishing ground, they still rely on technology handed down from their ancestors. They use traditional boat that equipped with engine. They also build bagan, a bamboo structure that is planted in the middle of the sea, equipped with bait. Every night they will sail to their bagan to turn on the lights as a towing fish to gather. Early in the next morning they will lift the net which is usually already heavily filled with fish. In negotiating the change of seasons, individual fishermen and labor fishermen travel to other fishing ground in the surrounded areas. This is done to get more fish to catch.

In carrying out the economic activities, fishermen utilize members of the family to increase the economic values of the sea catches. Fisherman family members participate in work, such as selling or making home industries and also making salted fish. Table 4 above also shows that only skipper that has social networks outside the village. These social networks are important for marketing catches and fish processing. With these social networks, skippers can increase their income and also act as middle person for individual fisherman, to support them sell their catches. This chain shows by Figure 4 below.

![Figure 4. Chain Pattern Fisherman Activity](image-url)
According to Figure 5 above, we can see the different livelihood patterns from each fishing category. Labor fishermen must carry out fishing activities with individual fishermen or skipper fishermen because they do not have physical assets such as boats or charts. Their catch can be sold to middleperson at sea or sold to fishermen to be processed into salted fish. The amount of the catches fish results for laborers are minimal because they are shared equally by ship owners. In contrast to individual fishermen, their livelihood patterns are simpler considering that they have physical assets in the form of charts (bagan) and boats. They sell their catch to middlemen or skipper.

The skipper fishermen use labor fishermen to run their boats or charts. Unlike other fishermen, besides selling to middlemen, skipper fishermen can also sell their catch to the Pelabuhan Ratu Market. Their extensive social networks support them in selling fish catches. Besides being able to sell to Palabuhan Ratu, fishermen can also sell salted fish to the Bogor area.
Figure 6 shows agriculture area in Sangrawayang Village. The agricultural area is located around a fishing settlement, located in the coastal area of Sangrawayang Village. Fishermen carry out economic strategie diversification as farmer as well. This activities involve family member and carry out by all residents. This finding different from previous study findings [2]. In his research, Suharno found out that demographic profile influence the fishermen diversification livelihood.

In Sangrawayang Village, fishing activities are concentrated in the south. While other economic activities are scattered in other areas. Fishermen who diversify their livelihoods in the form of selling at the stalls hang along the road to Ciletuh Geopark. In Figure 6, the stalls are represented as black triangle. Fishing activities opened stalls become a challenge in fishing activities. However, hey are reluctant to leave their profession as fishermen because the opportunities in the tourism sector are still small. The information was obtained from informants of labor fishermen, individual fishermen and skipper fishermen. This phenomenon also happened in Shichuan province in China, where tourism income as part of the livelihood assets of farmers in Jiuzhaigou Nature Reserve in Sichuan Province, China [10].

In addition to utilizing maximum assets, fishermen also get help from the government. Programs are given in the form of various programs. Unfortunately, only skipper fishermen who get the opportunity in the government program. This happens because there have assets that support the implementation of the program. While poor labor fishermen, do not get the opportunity to develop themselves. Even labor and individual fishermen have high human asset, they do not have the chance to be involved in the government program. This situation is contrary to the situation that happened in coastal villages in Bacacay in the province of Albay, Philippines [11]. In Bacacay, government program focus on enhancing the human and social assets so that the fishermen could increase their adaptive capacity and build resilience.

4. Conclusion
Fishermen in Sangrawayang Village can be categorized into three, namely skipper fishermen, individual fishermen, and labor fishermen. All types of fishermen satisfied to be fishermen even they have other financial income. Skipper fishermen, the wealthier among others, have high assets to run their business, specially social asset. With networks outside the village, they could increase their income by establish cooperation with outside partners. While individual and labor fishermen, with their low social asset, have to look for other sources of livelihood in the neighborhood.

The government program carried out in this village more empowered skipper fishermen. This is done because the programs that are arranged require strong assets to support program implementation. Individual and labor fishermen unable to participate the fisheries development program due to limited assets and access. Therefore, in the future it is hoped that there will be a program that can fulfill these two groups of fishermen needs”.

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