Livelihood strategy of coastal households during covid-19 pandemic: case study in Wermaktian District, Tanimbar Islands Regency

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Abstract. This research aims to analyze coastal households' livelihood strategy in coping with the covid-19 pandemic, especially for the households who live by coastal forest in Wermaktian District, Tanimbar Islands Regency. Research is conducted at two villages, namely Marantutul Village and Batuputih Village. These villages are selected because the households in that village undergo both farming and fishery activities. The sample is determined purposively, involving 60 households with 30 households taken from each village. The research shows that households who live by coastal forest have used several strategies for fulfilling household necessities during the covid-19 pandemic. Those strategies are classified into three categories, respectively on-farm (intensifying farming works), non-farm (working at lumber industry), and off-farm (as a trader). Working in the lumber industry has the biggest contribution to household income, which is 53 percents. The remaining percentage is contributed by copra commodity, crops, fishery, and household services.

1. Introduction

1.1. Background

Previous research generally viewed livelihood strategy as a very important measure that enables every household to maintain life necessities. Those researches took its context from either large islands or small islands and found that the households on those islands have many options to fulfil their life necessities. Coastal households have several options for their livelihood, but mostly, their livelihood option always involves farming and fishery that require them to access land and sea. Therefore, farming and fishery are dominant activities among these households. Indeed, their livelihood activities are the product of their adjustment to the natural and environmental conditions, and this is done through the so-called adaptation process.

[1] Distinguished the livelihood strategy into three categories: farming intensification, non-farming extensification, and livelihood strategy diversification. These categories add the diversity of livelihood strategies for the households. [2] obtained several findings from their research in Playen District, Gunung Kidul Regency, Jogyakarta. It was found that most farmer households used a mixed livelihood strategy,
which comprises of three elements such as younger age of husband, higher expense per capita, and more substantial capital of household physicality. All those elements can affect household welfare. Meanwhile, the coping strategy and location-based strategy did not affect household welfare. [3] Explained that to fulfill their daily necessities and to maintain their livelihood during the unfortunate condition, sugarcane large holder (big scale farmer) households used both their natural and financial capitals, while sugarcane smallholder (small scale farmer) households spent their financial capital more dominantly. All the researches above were carried out in the context of large islands.

Other researches were conducted in the context of small islands. In general, the findings showed that farmers who live by the coast could also act as fishers if the climate makes them do so. Role switching from farmer to fisher often occurred in small islands, signifying that farming and fishery are hardly separated. [4] explained that farmers in small islands tend to use a collaborative livelihood strategy that involves role switching between farmer and fisher with climate as the main factor influencing this role adjustment. Among the livelihood strategies used in small islands are the lending-borrowing initiative (63%), the marketing of farming and fishery products (59.5%), and the use of farming outputs as collateral (42%). Kinship bonding is the most influencing base in the economic activity of households in small islands.

Central Bureau of Statistics [5] reported that the Wermaktian District population is as much as 13,396 persons consisting of 6,765 men and 6,631 women. Farming activity in Wermaktian District is dominated by crop commodities, such as dry field rice, edible tubers, beans, and corn. Those commodities are subsistence in nature or precisely used to fulfill household food necessities. Coconut is the leading commodity in the District, with a planting area width of 3,120 hectares, and the main output of this commodity is copra. The production of captured-fishery increased to 1,500 tons in 2019.

There is a diversity of livelihood strategies that the households in the Wermaktian District can use. But, only two strategies are dominant, respectively farming and fishery. Those strategies are widely used to manage livelihood sources for the fulfillment of household necessities.

1.2. Problem Formulation

Several research types on the livelihood strategy of the households in small islands have been conducted in the last two years. When the climate changes, farmers sometimes must switch their role in the household into fishers. When such role switching happens, it might be difficult to determine which activity is the main job of coastal households in small islands. Therefore, farmers-fisher households become the designation given to households to implement the economic activity in two sources of livelihood, precisely land and sea.

The researches intended by the paragraph above are [6-12]. All those researches have the same findings, more or less. Households in small islands rely on their activities on land and sea to fulfill their life necessities. Therefore, households in small islands have two natural resources for their livelihood, respectively land and sea. The utilization of those resources becomes the cultural legacy across generations. It has been recognized as local wisdom by the people of small islands to be used to fulfill their livelihood. The latest research by [12] showed that the households in Tomra Village, Leti Island, Northwest Maluku Regency, anticipated rainfall anomaly through three livelihood strategies, respectively on-farm activity by breeding livestock, off-farm activity by working at livestock ranch, and non-farm activity by working at service sector.

During the covid-19 pandemic, coastal households must choose the proper livelihood strategies to ensure that their life necessities are fulfilled. The covid-19 pandemic has impeded many livelihood activities. The Government restrains households from keeping them staying at home for a while, but this restraint disturbs financial stability. Apart from this condition, there are still a few research types on livelihood strategy during the covid-19 pandemic. The reason is possibly because this pandemic is new and becoming a serious outbreak since March 2020. Therefore, the research problem is: "What is the livelihood strategy used by coastal households to cope with covid-19 pandemic".
1.3. Research Objective
This research aims to analyze the livelihood strategy of coastal households in coping with the covid-19 pandemic and examine the contribution of livelihood source on the income of coastal households in Wermaktian District, Tanimbar Islands Regency.

2. Methods

2.1. Time, Location, and Sampling Method
The research was conducted in Wermaktian District, Tanimbar Islands Regency. Two villages were used as sample village, namely Marantutul Village and Batuputih Village. These villages are selected because coastal households in the village are implementing both farming and fishery activities. The research was carried out for two months, from May to June of 2020. The sample was determined purposively with a criterion that the households had conducted farmer and fisher activities in a year. Thirty households were taken from each village, and therefore, the total household sample was 60 households. The key informant was selected from each village to explore the answer given by the respondent. Researchers believe that the key informant has information regarding the households in the sample village.

2.2. Data Collection and Data Analysis
Primary data are usually collected by giving questionnaires to respondents [13] or conducting depth interviews with key informants [14]. Secondary data are usually obtained with participative observation [15], [13]. Researchers must participate in daily life and then listen to what the people (research subject) say and differentiate what the people and not do. The current research is processing both types of data. Data are analyzed using Simple Tabulation to describe the condition and characteristic of the research location. Data are then displayed in the table and diagram to facilitate readers to understand the research location.

3. Result and Discussion

3.1. Source of Livelihood
There are three dominant livelihood sources for the households in Wermaktian District, respectively forest clearance, fishery, and farming (planting crops). In the sample village, respectively Marantutul Village and Batuputih Village, forest clearance has the highest household income contribution. Forest land in those villages is still vast and providing timber species with high economic value. Forty individuals are working as the chain saw operator in each sample village. Being a chain saw operator had given economic value to the village people since Trans-Yamdena Road's opening. Forest clearance has become rampant in the last ten years due to high market demand every year. The greatest demand for timber-based commodity comes from traders in Wermaktian District's capital and the capital of Tanimbar Islands Regency, who are mostly Chinese descendants. The trade on timber outputs (plank and bar) is made to supply market demand not only in the locale but also in other regions. Timber species with high economic value, such as linggua timber, iron timber and torem timber, are highly demanded. Besides supply market demand, household demand for wood products (plank and bar) is also high because people in sample villages usually use them for house construction. It is supported by the fact that almost all inhabitants in the sample village cannot afford cement for constructing house wall, and they replace cement with wood plank made from linggua timber.

However, a lucrative opportunity in forest clearance works simply the people to neglect other livelihood works such as farming, fishery, service and others. If it is examined thoroughly, the latter sectors are not less important than the former in contributing to household income. The current research has few findings regarding this comparison. Among the findings is that the second-highest contributor to household income, after forest clearance as the first, is coconut commodity that is processed into copra. The next contributor is occupied by edible tubers and fishes, but these commodities are mostly produced
for household consumption or precisely not for sale. The following table indicates the detail of the contribution of various sectors to household income.

| No | Sector                                  | Income Level (IDR/ Month) | Contribution (%) |
|----|-----------------------------------------|---------------------------|------------------|
| 1  | Farming                                 |                           |                  |
|    | a. Coconut                              | 600,000                   | 6.5              |
|    | b. Crop                                 | 200,000                   | 2.2              |
|    | Sub Total                               | 800,000                   | 8.7              |
| 2  | Fishery                                 |                           |                  |
|    | a. Fish                                 | 500,000                   | 5.4              |
|    | b. Cuttle                               | 300,000                   | 3.3              |
|    | c. Shrimp and Sea Cucumber              | 500,000                   | 5.4              |
|    | d. Sea Weed                             | 300,000                   | 3.3              |
|    | Sub Total                               | 1,600,000                 | 17.4             |
| 3  | Service                                 |                           |                  |
|    | a. Trader of Forest and Fishery Products| 500,000                   | 5.4              |
|    | b. Small Store                          | 300,000                   | 3.3              |
|    | Sub Total                               | 800,000                   | 8.7              |
| 4  | Forest Clearance                        |                           |                  |
|    | a. Chain Saw Operator                   | 5,000,000                 | 54.3             |
|    | b. Wood Carrier                         | 1,000,000                 | 10.9             |
|    | Sub Total                               | 6,000,000                 | 65.2             |
|    | TOTAL                                   | 9,200,000                 | 100.00           |

Source: Data of Research, 2020

3.2. Contribution of Livelihood Source to Household Income

Based on the contents of Table 1, the highest contributor to household income is coming from a job called chain saw operator, either in the way of monthly or annually (54.3 percents). If every operator produces two cubics of timber per month, the operator will get an income of IDR 5,000,000.00 by a condition that the average sale price of timber per cubic is IDR 2,500,000.00. The commercial timber type in the market is first-class species, such as linggua timber, iron timber and torem timber. These species are usually traded in the forms of plank and bar. Plank products are often made from linggua timber, whereas bar products are produced from iron timber and torem timber. The sale price for wood products is the result of shared commitment between the chain saw operator and trader/buyer. If trader/buyer agrees that timber is collected at the place of their choosing, then the average sale price is IDR 3,000,000.00. If the location of timber is determined by the chain saw operator, for example, the timber is collected from sawmill, then the sale price can only be as much as IDR 2,500,000.00 per cubic. Besides first-class timber, chain saw operator also processes second-class timber such as white timber, yellow timber and others. The sale price per cubic of second-class timber ranges from IDR 1,200,000 to 1,500,000. Builders usually buy this second-class timber to be used as construction material, particularly as storey supporter during concrete pouring. Therefore, when the households plan to build or renovate the house, second-class timber becomes a popular option because it is cheap and reliable. The high demand for timber among the locals is reasonable because almost all inhabitants' houses in the research location use wood plank wall. If the house owner must hire the work of chain saw operator, then the owner must pay the costs of fuel (gasoline and lubricant oil) and meal (food/beverage and cigarette).
Trans-Yamdena Road’s opening that connects many villages in Wermaktian District indirectly increases the frequency of lumber logging. The road helps the households to access other villages for selling their products, but the road is built after clearing several forest lands, which signifies that the number of critical lands is increasing and the households must take the long walk to find woods for their house or to buy first-class timber for commodity. For instance, they must take a journey for 10-15 kilometres or spend 1-2 hours of journey to go to the logging site.

Moreover, the fishery sector also contributes to household income in Wermaktian District, and its contribution level is 17.4 per cent. Shrimp and sea cucumber are commodities harvested once a year. The regular customer for those commodities is traders who usually act as a reseller in the regency capital. Fisher's breed shrimp nearby the downstream or along the bay of sample village. The harvest is done in October – December using net and *Bubu* (fish trap). In the village market, shrimp is traded with a sale price per bundle of IDR 20,000 – 30,000. Sea cucumber is traded usually in dry form, with a sale price of IDR 400,000 – 500,000/kg for the superclass. Regular sea cucumber is sold at the price of IDR 50,000 – 75,000/kg.

Two sectors give the same contribution to household income, respectively the service sector and farming sector. The contribution level of both sectors is 8.7 percents. Two players dominate the service sector, respectively traders of forest and fishery products and small stores (that sell nine staples). In each sample village, usually, there are 8 – 10 households that open staple small store. Not many villagers are dared to be traders of forest and fishery products because this profession is expensive. Being a trader requires them to take a journey from the trade centre, usually the capital of regency, to the potential buyer, signifying that it involves huge early capital.

The outputs of the farming sector are not for trade but household consumption (subsistence). The only farming output for trade is copra, but the designation for sale is not given to edible tubers such as cassava, sweet potato, yam (*gembili*), and others. Fruits, such as mango and orange, are sometimes traded, but the trade is often done once a year and only relies on collector trader in the village/district to buy the fruits and then sell them in the regency market.

4. Conclusion
Coastal households use several strategies to fulfil their livelihood during the Covid-19 pandemic. Those strategies are classified into three categories, respectively on-farm (intensifying farming works, especially for crop commodity and forest products), non-farm (working at lumber industry), and off-farm (as a trader). Working in the lumber industry, which allows utilizing timber products, has biggest contribution to household income, which precisely is 65.2 percents. The remaining contribution is given by other sectors, respectively fishery sector through shrimp and sea cucumber, service sector through traders of forest and fishery products, and farming sector through copra and subsistence crop.

The utilization of timber products must be considered because improper logging management may impair the forestland in Wermaktian District. Soil degradation in the corrupted forestland may badly impact environmental sustainability. The local Government must regulate the lumbering activity and utilize timber products, at least in favour of the next generation.

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