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The Livelihood Strategies of Residents Around Limboto Lake

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Abstract: *People around Limboto Lake are generally dependent on the activity of agriculture and fisheries as a source of life. The lake's environmental changes caused the residents to lose their livelihoods and further decline their revenues. Ultimately, the residents should be able to manage their resources in order to come up with various livelihood strategies to meet the needs of the household. The purpose of this research is to analyze the livelihood strategies around Limboto Lake.*

The study employs a survey research method which combines quantitative and qualitative approaches. The research takes place in the villages around Limboto Lake, namely, Kayu Bulan Village of Limboto Subdistrict, Lupoyo Village of Telaga Biru Subdistrict, Tabumela Village of Tilango Subdistrict, Iluta Village of Batudaa Subdistrict, and Limehe Timur Village of Tabongo Subdistrict. There is a total sample of 228 households obtained by systematic random sampling. Furthermore, the research engages qualitative and quantitative analysis of the data obtained. The descriptive quantitative approach is used to analyze the data from the questionnaires, and the qualitative data is involved in studying the data from in-depth interviews and observations, to clarify and strengthen the analysis of quantitative data.

The result shows that there are twelve strategies implemented by the residents nearby Limboto Lake. These livelihood strategies will be effective only if the residents can process and utilize their assets to sustain their life. Consequently, it is necessary for the inhabitants around Limboto Lake to use the resources of the lake by considering to the lake's ecological aspects.

Keywords - *livelihood strategies*

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I. INTRODUCTION

Limboto Lake is a natural resource located in Gorontalo province. Its presence plays a vital part in supporting the lives of the society as well as the organisms living in the lake. This leads to an aligned and balanced environment for the ecosystem native to Gorontalo province.

However, due to the siltation of the lake, the Limboto Lake loses its function to maintain the balance of the environment within the area. A number of recent studies report that the lake is in its critical status. Since 1934, sedimentation and the trend to open farming sites or to build houses decreased the area and the depth of the lake; from ±7000 ha with 14 meters depth to ±3000 ha with the depth of 2.5 - 4m (State Agency for Environment, Research, and Information Technology [1].

The shrinkage of the lake area influences the storage of the water, particularly from the rain water and mountains nearby. When it is raining, floods cover the area close to the lake. On the other hand, the issue of clean water supply arises in the summer. Decreasing depth affects the population of the fish, lessen the income of the fishermen and thus ended up jobless especially when it reverts to the rainy season.

Damage to the lake ecosystem is the consequences of human exploitation over the Limboto Lake catchment area. This impacts on the life of the fishermen because they rely on the natural resource within the lake. Consequently, the fishermen will have a hard time to fulfill primary needs. In addition, a complex economic problem, such as the growing demand of the secondary needs makes the issue worse. According to [3], such an economic crisis is inevitable to the most of the people in rural areas. They are vulnerable to unexpected problems, from the environmental factors or the results of exploitation by humans, due to the lack of problem-solving skills. In order to [4] describing the vulnerability as a situation with no asset that leads a family being prone to problems and risks. A family with livelihood problems will be over-dependent, and also feel insecure.

The community nearby the Limboto lake riverbank, i.e. farmers, traditional fishermen or small-scale fisheries, and other citizen are prone to the issues of economic, social, and resources related to the poor lake environment. This circumstance forces the people to be able to manage their income as a part to find out livelihood strategies. People are obliged to employ approaches such as applying a set of activities to support

their daily needs. According to [5] defines that livelihood strategies as a set of efforts of a family for a better welfare. The strategies consist of entrepreneurship of the residents, methods in obtaining various assets, its choice for investment, as well as maintaining the assets and its income.

Access for the communities to the natural resource of Limboto Lake has been restricted due to the declining and limited resources. This generates questions about strategies of livelihood for purposes other than live sustainability and development. Whether it is necessary to seek other strategies, or whether the communities should migrate to another area for better living.

Livelihood strategy refers to efforts that are essential to meets targets, such as fulfilling the needs of a family or household. According to [6], the livelihood strategies comprise of survival strategy, consolidation strategy, and accumulation strategy. Zommers further categorize these into four typologies, namely accumulation strategy, consolidation strategy, compensatory strategy, and security strategy. On the other hand, Scones (2001) scrutinizes the classification into only three typologies, such as agricultural resource engineering which involves intensification and extensification, various livelihood patterns (diversification), and migration.

This study attempts at observing communities in five villages nearby Limboto Lake as the people living there have choices to support their livelihood. Therefore, this research aims at analyzing the livelihood strategies of the communities in those villages.

II. RESEARCH METHODS

This study employed a survey research with a mixed method of qualitative and quantitative approach. This research was purposively carried out in five villages nearby Limboto lake, including Kayu Bulan village of Limboto district, Lupoyo village of Telaga Biru district, Tabumela village of Tilango District, and Limehe Timur village of Tilango district. Selected villages were displayed in a research site map due to narrowing the site object.Samples of research comprise of 15 percent from 228 households. A systematic/random sampling was applied to determine the total sample that represents each object site of the study.

The quantitative and qualitative approach was utilized to analyze the data. Quantitative data from a questionnaire was examined descriptively. Furthermore, the display data is in the form of a table of frequency. A data-analysis software SPSS version 20 was used to process statistical data. Transcripts from an in-depth interview and observation results were used to provide a better data elucidation.

III. RESULTS AND DISCUSSION

The residents' settlement contributes to the way the people employ their livelihood strategy. In addition, the ecological condition, such as lowlands with hilly areas and wet farm lands or rice fields, tidal rice field, and dry farm land in some parts are considered as contributing factors. The lake condition that determines the fisheries activity is a perfect example of this case. Varied characteristics of the residents within the object site and the basis of the livelihood strategies reflect the efforts in dealing with financial issues. Although living in a same ecological site, strategies from one household may be different or even similar from one to another. Moreover, it is possible to have two strategies in one household. The following section discusses the application of livelihood strategy based on the results of this research.

3.1 Strategy of Daily Needs Fulfilment

This type of strategy refers to the effort of farmers and fishers to strengthen their works through possible opportunities regardless the limitations that these workers have. Farmers and fishers need to work harder to supply the primary needs of their family. The following Table 1 illustrates the percentage of daily needs fulfillment of these communities.

Table 1. Percentages of Daily Needs Fulfilment

Village	Purchasing cheap foods	Frequency of Consumption	Distribution of Food Consumption	Fasting	Limiting Portion of Dishes
Kayu Bulan	91.67	94.44	97.22	5.56	69.44
Lupoyo	96.55	96.55	96.55	17.24	31.03
Tabumela	95.92	93.88	81.63	16.35	44.90
Iluta	87.50	64.58	66.67	3.56	31.25
Limehe Timur	98.48	95.45	78.79	7.58	45.45
Averages	**94.30**	**88.60**	**82.02**	**10.96**	**44.30**

Source: Primary data, 2014

The residents within the site object spend less on meals because they prefer purchasing the foods in weekly or traditional markets. The pricing determines the purchasing power of a household. The more expensive the food and the lesser the purchasing power end up in problems of accessing the food supply. By that, the respondents attempted to consume cheaper foods from harvested vegetables or tuber roots. The consumption frequency is decreased from three times a day to twice or even once a day. The portion of dishes can even be decreased and thus leaving the people no choice but fasting.

Consuming low-quality foods is the only way for families with economic issues. Bulk food is among the food listed on their shopping list. On the contrary, wealthier households with the high educational background or greater social status are the ones who get everything they need, including high-quality foods.

3.2 Budget Minimization

The respondents reduced the consumption of the daily staple to cut the budgets of the everyday staple, particularly rice, meats, and vegetables. As extracted from the observation result, Lupoyo village scored the highest percentage of reduction of daily staple consumption with 68.34 percent. Moreover, Kayu Bulan village was in the second position with 50.76 percent consumption minimization. Iluta and Limehe Timur village were in the third and fourth rank respectively, with the percentage of 46.59 percent and 44.63 percent respectively. Being in the last place, Tabumela scored 35.81 percent in daily staple minimization. By the minimization, the residents mixed rice with dried corn for the staple, widely-known as *Baalibinthe.* In some occasions, to reduce the use of rice, the residents only consumed corn for staple.

The respondents minimized the budgets for daily staple consumption to the extent that it was bigger than their reduction of everyday staple consumption. This is due to the consideration that ready-to-serve foods and snacks were non-primary foods and relatively more expensive by foods prepared at home. Therefore, the residents were able to cut down the budget. Furthermore, the respondents minimized the budget for clothing by shopping for the clothing for only once a year; reduce their children's pocket money, and minimized the use of electricity and water.

3.3 Substitution

The farmers and fishers who lost their job substituted to alternative jobs to keep making income for the family. The households engaging substitution are the ones which previously relied upon the agricultural and fishery activities but managed to find alternatives to equal or higher income than the previous job. In some households, the alternatives were part of the previous job, while some alternatives were different for some households. Some alternatives were jobs in the service sector and office jobs. The result discovered job substitution in the following villages: Tabumela (12.45 percent), Kayu Bulan (8.33 percent), Desa Limehe Timur (7.19 percent), Desa Lupoyo (6.21 percent), and Iluta (2.29 percent).

During floods and in the rainy season, some boat owners functionalized their boat originally for fishing as transportation. The boat owners realized that they need to make additional income when the condition is unfavourable by renting their boat, functionalizing their boat to as a crossing vehicle and by selling foods and drinks on-boat (mainly in Tabumela and Lupoyo village), or to substitute to working with the local government or NGOs (primarily in Kayu Bulan and Iluta village). In Lupoyo and Limehe Timur village, as a substitution, the farmers hunted for fishes in small puddles on the rice fields. In addition, in Limehe Timur, some rice farmers substituted the crop to water spinach.

In Tabumela, Lupoyo, and Kayu Bulan village, some fishers only stayed at home when fishing is impossible. To spare time, they only made their fishing tools or a client's orders, i.e. fishnet, *built* and *tinggawango*.

3.4 Land Use

During the dry season, the farmers in Iluta and Limehe Timur village substituted rice fields to grow maize. Moreover, the residents in Tabumela village utilized the space of receding lakes to grow vegetables for consumption and to be sold at the market. In Limehe Timur, the residents temporarily substituted fish ponds to become rice fields.

Moreover, water puddles were unavoidable during the rainy season. The residents utilized the land to grow rice when the water has receded. Corn and other horticultural crops were preferred in substituting rice as temporary crops, as they expected to earn short-term income for daily needs and other expenses, such as school tuition fee, medications, and debt repayment. These kinds of activities are known as *halabolu* by the locals.

3.5 Mobility

Mobility strategy, in its essence, is the response of the households to a current situation that they deal with. Economic pressure, natural disasters, and other social reasons are some examples of such case. Mobility strategy is applied to overcome this issues, even though it is rarely used in most circumstances. It is possible to

have the communities migrate and occupied a new residential permanently or temporarily. A temporary mobility is widely known as circular mobility. Issues of getting a job encourage a family to find another settlement area through the two types of mobilities previously explained.

The results reported that the samples opted to have a circular mobility as their livelihood strategy with the preference of working within the same sector, in a given period. For example, after harvesting the crops, farmers migrate to another area to find a new job especially when other areas are in the growing season. They usually work in a group with having their harvest crops of 10 percent distributed to the workers. The idea of inheriting jobs is not considered as the rationale behind the people's migration.

Additionally, the migration of the farmers applies to the fishermen as well. Some fishing gears, such as fishing net and motor boat, are used by groups of fishers of Limboto Lake to do the fishing activity on the sea. This mostly happens during the peak season of *Ikan Nike* (kinds of anchovy) for about 10 days. The catch will be exported to some industries or markets. The income from the fisheries is around five million to ten million rupiah per day. On the 10^{th} day, the fishermen only get one to five million rupiah per person due to paying the rented boats. Fishers of Tabumela and Iluta village are the ones who migrate the most because they live close to the Limboto Lake. The people have no issues about transportation to the sea because of the villages are close to the capital city of Gorontalo city. Circular mobility is even easier for the fishermen of Tabumela village because it is located in the borderline of the capital city.

In addition to the circular mobility, people sometimes migrate and stay in a new settlement permanently widely known as permanent mobility to fulfill their primary needs. Households in Lupoyo village, Tabumela village, and Limehe Timur village are mostly running a business in the nearest city like Manado or even in Kalimantan. Furthermore, people of Tabumela and Limehe Timur work as gold miners and farmers to support their family needs, to renovate their house, and to return to their hometown during *Idul Fitri* break for some migrants living in these villages.

3.6 Spending Households' Saving

Limiting budget on buying activity is inevitable if there is a dropping in the income of a family. This can be done through having a bank account. The results reported that this strategy is applicable only for the households with no debt or bigger income. Fishers and farmers, whose wages are used to supply their needs or to pay off debt, are unlikely to employ such a strategy.

Some households of Tabumela village spend more budget than those of Iluta village. In other words, Tabumela villagers are the ones who employ this strategy the most. Having a bank account is necessary to save the money of the households in addition to the traditionally keep their money in hand. This is also to prevent unnecessary spending and to prepare for children's education fees. Furthermore, opening a bank account is effective for investment for working capital. Most of the household with no debt seems to be in the right position to apply this method. However, those who work as, for example, farmers and fishers will find it difficult to gain benefits from having a bank account. This is because the wages of these types of workers are usually for pay off debt.

3.7 Pledging and Selling Asset

Pledging is one of the solutions if there is a declining of the income of a household. Pledging is similar to loaning but with simpler procedures, especially loaning to formal or informal financial institutions. The advantage of pledging is to prevent additional spending when households suffer from an economic problem due to declining in their income. If borrowers are unable to return the loan from pledging, their security bond will not be returned to them.

There is a significant difference between the percentages of selling asset and pledging. The proportion of households that have their asset being a security for pledging is of 11.40 percent. This outnumbers the percentage of selling non-productive assets (such as dining set) with 1.75 percent from the respondents in Kayu Bulan district and Lupoyo village. Selling productive asset and selling jewellery is below the percentage of pledging with percentages of 6.58 percent and 8.77 percent respectively. This strategy is exclusive to a family who owns assets or jewellery for educational budget or modal capital investment. Pledging is due in certain circumstances, such as when there is a drop in the income of a household.

3.8 Loaning

Products of farming and fishing that remain unstable determine the rate of the respondents of this research. If the revenues from these two activities are insufficient to fulfill their needs, they can only rely on their families, neighbors, or the other farmers/fishermen. The lender can only lend some money only if they have no financial issues.

Asking for financial help from families or neighbor is possible because the amount of the money being lent is quite small and it is used only for the supply of daily needs. Considerations such as the ease of the procedure and the availability to access the money are the main reasons of loaning. Families are in the top list of the lender with the amount of money around 50 thousand to one million rupiahs.

A bank is also an option for farmers and fishermen for loaning other than asking from their families, neighbors, or loan sharks. Formal bank lending is only for those who have a bank account to pay off their debt. The procedures of loaning from a bank are complex and risky. Borrowers are required to provide applications according to the policy of the bank before getting the loan. Some certificates and ownership deeds, such as land title deed and business license are the usually on the list of the documents that must be provided during the loan process.

Applicants need to agree with the procedures and the laws of bank loan. The transaction for farmers and fishermen is usually around two million to 10 million rupiah at maximum. A transaction with more than 10 million is rare and precarious. The money will be used to prepare for their children's education fee, to buy daily needs, and to start a small business. This helps fishermen to repair their fishing tools, to buy fish seed, feed, and other expenditures. Incomes from aquaculture activity will be used to pay off loans, either bank loans or from families and neighbors.

3.9 Social Networking

Social networking comes in handy when there is a decline of the income from the product of farming and fishing. This is based on the impact of social networking towards the respondents of this research. Types of networking such as a post-harvesting contract (19.74 percent) and donations from families and friends (25 percent) contribute to the livelihood of the research objects. A charitable donation program named Bantuan Langsung Tunai (or BLSM in short), with the percentage of 45.18 percent, proves to be helpful to solve the financial problem as well. Other forms of donation, for example, fertilizer, fuels, plant seed, and fish feed are given by cooperatives with the percentage of 5.18 percent. Farmers and fishermen are seldom to buy fish feed or rice seed because the seeds are purchased from distributors, while rice seeds are already stored prior to planting seasons.

3.10 Allocations of the Resources of Households

Harnessing every single member of a family is the notion of allocating the resource of a household. Each family member works according to their specialization to contribute to the income and sustainability of the household. Nevertheless, husbands are always the ones whose wages supply for their family's livelihood. This applies to the farmers and fishermen communities in the site object of this research.

Women and children of the fishermen communities within Tabumela village mostly help their husband as the breadwinner. They clean the fish prior to selling to the traditional markets nearby. It is expected that cleaned fish might attract more customers buying their products.

In Limehe Timur village, teenagers who can ride a motor bike help their parents selling vegetables picked by their mother. Meanwhile, women of Kayu Bulan district and Iluta village bake varied traditional cakes and ran a textile business popularly known as *Karawo*.

3.11 Investment and Expansion

The data of the investment and expansion of the respondent of this research are explained in the Table 2 as follows:

Table 2. Percentages of Business Investment and Expansion

District/Village	Types of Investment and Expansion				
	Total Savings	Bank Loan	Grocery shops	Other business	Others
Kayu Bulan	22.22	13.89	8.33	5.56	13.89
Lupoyo	34.48	6.90	0.00	6.90	0.00
Tabumela	26.53	12.24	6.12	4.08	6.12
Iluta	54.17	4.17	10.42	6.25	20.83
Limehe Timur	26.53	12.24	6.12	4.08	6.12
Total Averages	**32.79**	**9.89**	**6.20**	**5.37**	**9.39**

Source: Primary data, 2014.

Farmers and fishermen families who are subject to this research do some investments and expansions to support their livelihood. Saving money to a bank account is for those who have extra income. This type of a household may also loan money from a bank as a business capital with having their ownership certificate as security before paying off the loan.

On the other hand, those who have sufficient income for their business capital, expanding business in other sites are possible. For instance, a fisherman can start a business of selling fish feed, seed, or fish auction. Households with a higher income, like those in Iluta village, are likely to employ this strategy. While the villagers of Iluta prefer to sell fishing equipment, residents in Kayu Bulan district prefer running a grocery store due to the strategic location to run such a business. The products are sold in bulk quantities. Interestingly, households in Tabumela village can run both businesses: running grocery shops or selling building and construction materials as well as a fish auction.

3.12 Job Diversification

The diversification of the job of the object households reveals that these respondents have more than one job in addition to the main job. The job might be different from the one they are currently working at. It aims at supporting their livelihood and gaining more incomes. For example, fishermen and farmers are sometimes working part-time under the supervision of a leader.

Table 3. Percentage of Job Diversity

District/Village	Combination of Jobs	Additional Part-time Job	Other Works
Kayu Bulan	41.67	44.44	38.89
Lupoyo	17.24	20.69	17.24
Tabumela	20.41	30.61	24.49
Iluta	25.00	25.00	22.92
Limehe Timur	39.39	40.91	39.39
Total Averages	**29.82**	**32.89**	**29.82**

Source: Primary data, 2014.

Families in Kayu Bulan district run other business, such as working as *bentor* (bike with a seat for the passengers on its front) drivers, farm workers, and fishing. Selling things as a part-time job is due while waiting for the harvesting season. Furthermore, additional jobs of the residents of Limehe Timur involve raising cattle, selling vegetables, working as labors. Spending more hours at working part-time is normal for them; they are even working full-time in a week to fulfill their basic needs.

Non-farming activities, such as selling fish or vegetables and working as *bentor* drivers from day to night or twice a day, start to become a trend for farmers and fishermen communities through the job diversification. All the households within the five object sites embed this similarity. Nevertheless, some of the households still prefer farming activities, such as raising cattle or planting vegetables and other horticultural plants as their part-time job.

A variety of livelihood strategies of the households ranges from mariculture to farming activities and from tidal rice fields to usual corn fields. Incomes from these activities will be used to supply their lives if the wages from their main job are insufficient. In summary, the results of this study reveal that all farmers and fishermen communities within the five object sites apply different livelihood strategies.

IV. CONCLUSION AND RECOMMENDATION

4.1 Conclusions

Livelihood strategies between households in a particular area may vary, or at least almost similar, depending on the type of the ecology of the site. This aims to supply their life or to fulfill their basic needs. Therefore, it is rare for farmers or fishermen communities to apply only one livelihood strategy. Factors such as time management, resource, and economy situation determine the combination of livelihood strategies. In other words, having multiple jobs for the fishermen and farmers communities is, indeed, a complex process.

4.2 Recommendation

Program related to adaptation to the change of Limboto Lake for the residents nearby are necessary to tackle some economic issues. The government needs to consider this as a solution to the natural problems that affect the catch and the harvest of the farmers and fishers. It is the obligation of the government to support and facilitate the small-scale business of these residents so they can explore themselves to promote creativity and

innovations in running their part-time works. This also allows them to start a breakthrough on their business as well.

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