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Determinants of Socio-Demography and Household Livelihood

(A Study in Iluta and Limehe Timur Village, Gorontalo Regency)

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Abstract- This research aims at analyzing livelihood assets and strategies in relation to socio-demography of households around Limboto Lake. Assets as livelihoods resource for inhabitants living around Limboto lake consist of human capital, natural capital, social capital, physical capital, and financial capital. The research took place in Iluta Village And Limehe Timur Village around Limboto Lake, Gorontalo Regency. It employed survey on 97 households of farmers and fishermen. Data were analyzed in descriptive and quantitative manner to determine the livelihood assets selected by households and were illustrated into an asset pentagon. The research results showed that the correlation between socio-demographic variable and livelihood assets was weak, which R-square value was 0.2532. The correlation of the influence socio-demographic variables (X_1) and Livelihood Assets (X_2) on Livelihoods Strategy (Y) was good. This correlation was indicated by the R-square value of 0.7055, meaning that variations on Livelihood Strategies (Y) were able to be explained by socio-demographic variables (X_1), and Livelihood Assets (X_2) by 70.55 percent, while the remaining 29.45 percent was influenced by other variables that were not included in the model.

Index Terms- sosio-demography, livelihood assets, livelihood strategies

I. Introduction

Human efforts to have a decent life cannot be separated from issues related places in which humans live their lives both as individual and social beings. Similarly, people living around Lake Limboto cannot be separated from Limboto Lake environment along with all its impacts such as floods and droughts which will affect its available resources.

In this research, the households of farmers and fishermen with diverse socio-demographic characteristics are generally dependent on the activity of agriculture and fisheries as a source of livelihood for generations. The condition of Limboto Lake experiences siltation and are shrinkage, if the rainy season will flood is estimated to affect farming activities and the fishermen who depend on the resources of the lake Limboto.

Limboto Lake has limited resources which make the access of the population to utilize it increasingly limited. Therefore, households should be able to manage existing livelihood assets to meet the needs of their households. This study aimed at analyzing livelihood assets and strategies in relation to the socio-demography of the households around Limboto Lake.

II. LITERATURE REVIEW

Hauser and Duncan describe the demography extensively in *The study of population* (Goldscheider, 1971), that there are at least three factors that are often included as an integral element in the demographic system, namely: (1) structure of population, including age distribution and gender; (2) composition of population, i.e. the socio-demographic characteristics of the population in broader scope, such as marital status, income, race, education, employment, or religion; (3) distribution of the population, i.e. distribution and location of people in a particular region.

Demography is one of the factors that affect resources to survive. A study of Thomas and Frankenberg (2004) found that age, education and gender of household head are not correlated with changes in total expenditure. They say that these results are surprising because the characteristics tend to be correlated with the level of ownership of assets so that it is expected to correlate with the adjustment of consumption from time to time. (Priyambada, et al., 2002).

The objects of this research were humans, i.e. households around Limboto Lake in relation to livelihood . A definition of livelihood can be seen in the concept of livelihood which was first popularized by Chambers and Conway in the late 1990s from the Institute of Development Studies (IDS), which established the definition of sustainable livelihood which was then widely known, referred, and adopted by other scholars and also donor institution for development, such as The Department for International development (DFID). The definition of livelihood in question is:

A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its

capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global level and in the short and long term." (Chambers and Conway 1992).

Livelihood assets as livelihood capital in this research employed the concept of capital from DFID (2001), known as the Asset Pentagon, consisting of human capital (H), natural capital (N), financial capital (F), social capital (S), and physical capital. The asset pentagon emphasizes the importance of understanding of various household livelihood conditions and the types of assets that support them. The asset pentagon describes that among components of the livelihood assets have diverse relationships and linkages with one another. The levels of accessibility to livelihood assets vary between individuals, households and communities. Moreover, there are many factors that influence the value of such assets for the benefit of livelihood.

Asset is the capital to carry out activities so that the goals of livelihood can be achieved. Ellis (2000); Scoone, 2001; Carney, (1999) distinguish five capitals including natural capital, physical capital, human capital, financial capital, and social capital. Such capitals have become major assets for people in their life as the sources of livelihood of the people because the availability of these assets supports diverse livelihood strategies.

Livelihood strategies of the household are the basis of selected livelihood activities undertaken by households to meet the needs or goals of the households. Livelihood strategies proposed by White (1991) are: survival strategies, consolidation strategy and accumulation strategy. Zommers (1999) classifies into four typologies, namely accumulation strategy, consolidation strategy, compensation strategies and security strategy, while Scones (2001), classifies into three typologies, namely agricultural livelihood engineering by intensification and extension, diversification of livelihood and spatial engineering (migration).

III. RESEARCH METHODS

This study is a survey research. The research took place in the Tabumela Village of Tilango Subdistrict and Iluta Village of Batudaa Subdistrict, located around Limboto Lake. The research location was chosen purposively. Research sampling was 15 percent of the population, namely 15 percent x 649 households = 97.35 ≈ 98 households. The number of samples was determined proportionally for each research village. The sample members were determined using systematic random sampling. Total samples were 97 households. The variables in the research include:

a) Exogenous variables (X), consisting of two variables:

- Socio-demography (X_1); ($X_{1.1}$) age, ($X_{1.2}$) number of children; ($X_{1.3}$) number of dependents; ($X_{1.4}$) length of stay; ($X_{1.5}$) levels of education; ($X_{1.6}$) works; ($X_{1.7}$) income
- Livelihood Assets (X_2); ($X_{2.1}$) human capital; ($X_{2.1}$) natural capital; ($X_{2.3}$) social capital; ($X_{2.4}$) physical capital; ($X_{2.5}$) financial capital

b) Endogenous variables, namely, livelihood strategies (Y): (Y_1) survival; (Y_2) consolidated; (Y_3) investment; (Y_4) diversification; (Y_5) mobility

Data were collected through observation, structured interviews, in-depth interview, and documentation. Data were analyzed descriptive- statistically in the form of frequency tables and graphs. Furthermore, the structural equation modeling (SEM) was employed by using Smart-PLS 2.0.m version, through a first-order approach to explain thoroughly the correlation between variables existing in the research. Stages of analysis using this method were: 1) Path analysis diagram to interpret outputs of Smart-PLS software, 2) Outer model or measurement model analysis to evaluate the correlation between variables and indicators or manifest variables, 3) Structural analysis (inner model) to evaluate the results of estimation of path coefficiency parameter and levels of significance.

IV. RESEARCH RESULTS AND DISCUSSION

Socio-demographic characteristics of respondents

Age is a basic characteristic of the population. This structure has important influence on demographic and socio-economic behavior. The majority of respondents were in the productive age, with the highest number in the age group of 30-54 years (80.41percent). The percentage of respondents' ages is presented in Table 1, and the number of household members is presented in Table 2.

TABLE 1
PERCENTAGE OF RESPONDENTS BASED ON AGE

Village	Age Group										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Tabumela	2.04	4.08	6.12	24.49	10.20	18.37	12.24	10.20	8.16	2.04	2.04
Iluta	0.00	2.08	4.17	18.75	16.67	14.58	20.83	14.58	0.00	8.33	0.00
Mean	1.03	3.09	5.15	21.65	13.40	16.49	16.49	12.37	4.12	5.15	1.03

Source: Analysis of primary data 2014

TABLE 2
PERCENTAGE BASED ON THE NUMBER OF HOUSEHOLD MEMBERS

Village	≤ 3 people	4-6 people	> 6 people	Mean
Tabumela	24.49	57.14	18.37	5
Iluta	16.67	64.58	18.75	5
Mean	20.62	60.82	18.56	**5**

Source: Primary data, 2014

Education is a main indicator of development and quality of human resources. It can be concluded from the research results that the majority of respondents' education level is low, as shown in Table 3.

TABLE 3
PERCENTAGE OF RESPONDENTS BASED ON EDUCATION

Village	Education Level				
	Not graduated from Elementary School	Elementary School	Junior High School	Senior High School	University/ College
Tabumela	24.49	63.27	10.20	2.041	0.00
Iluta	25.00	45.83	12.50	14.583	2.08
Mean	24.74	54.64	11.34	8.25	1.03

Source: Analysis of primary data

Respondents' income from primary and secondary job is presented in Table 4.

TABLE 4
PERCENTAGE OF RESPONDENTS BASED ON LEVELS OF INCOME

Village	Income (Rupiah)				
	< 1,000,000	1,000,000 - 2,000,000	> 2,000,000 – 3,000,000	> 3,000,000- 4,000,000	> 4,000,000
Tabumela	34.7	44.9	10.2	4.1	6.1 0
Iluta	31.3	14.6	18.8	10.4	25.0
Mean	33.02	29.91	14.46	7.22	15.45

Source: Analysis of primary data

Livelihood Assets Household

Livelihood assets of households in each village vary according to the five existing components of assets. The control of assets includes assets of human capital, natural capital, social capital, physical capital and financial capital. The level of accessibility to livelihood assets varies in each household. Analogy of asset the pentagon (Figure 1), in the position of the midpoint or the deepest of pentagon shows the levels of an individual or household access to the capital is zero, or there is no access at all. While the outer part of the pentagon is the ideal condition that an individual or a household has optimal access to the capital that they need. The analogy of the pentagonal can illustrate various conditions of changes in the level of accessibility to livelihood capital.

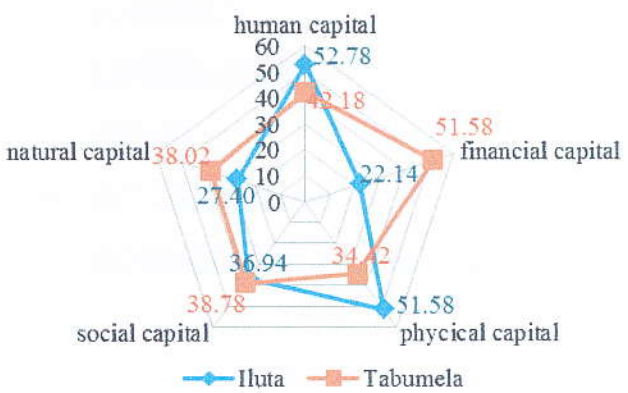

FIGURE 1

LIVELIHOOD ASSETS OF HOUSEHOLDS

Human capital includes skills of the respondents, labor, and health. Most of the respondents have homogeneous livelihood and skills, i.e. farmers as well as fishermen. Skills are mostly (73.20 percent) obtained from generation to generation.

Natural capital includes the use of lake resource. Residing around Limboto Lake, of course, households use lake resource for their life such as water to irrigate fields and to fish, the fish to be sold and consumed, bog plants (swamp cabbage), and grasses to feed livestock as well to make webbing. In addition, water hyacinth is partly used for handicraft. Moreover, grass is for animal feed, and also used as a traditional fishing gear, *bibilo*.

Land ownership in the bank of Limboto Lake mostly has belonged to the right of ownership and been certified. Located downstream of the lake, Tabumela Village has narrow piece of land which is generally used for building residential house and planting horticultural crops. Meanwhile, households in Iluta Village utilize the lake as floating fish cage farming.

Social capital includes household participation in social activities both socio-cultural and religious activities, social activities to increase economy and, political organizations, and other social activities in the environment in which households live. The participation of households in social activities such as socio-religious organizations is quite high in celebrating the commemoration of the Prophet's Birthday and Isra Miraj. Other activities such as neighborhood association for paying condolence (*rukun duka*), Islamic study group, Quran recital, and group activities of pilgrimage brotherhood. Not all social activities are formal organizations, but the forms of activities are mutual help and mutual aid (*huyula*).

The social organization of the neighborhood association for paying condolence is regulated formally by the local village community. There are procedures and conditions which have been agreed. Each member pays dues of Rp 5,000. to Rp 10,000.-. Mutual aid (*huyula*) is in the form of reward system, but this is very helpful when encountering unexpected disaster like death. Social activities for economic improvement include cooperation/ *huyula* (mutual aid) in the form of *Ti'ayo*. *Ti'ayo* can also be additional force deployment system from outside the household to fill shortages of force during the production activities of planting in the fields, especially in the early period of planting, mowing and harvesting. Also, fellow fishermen catch fish, floating cages and fish cages, but in the present time such activities are carried out through groups of farmers and fishermen and are paid from the land owner.

Socio-cultural activities in the neighborhood of households are like *huyula* in the form of *ti'ayo* is helping to make a tent for celebration/ mourning voluntarily. Social relations are still strong enough that their social life is very close. The level of kinship between residents is a characteristic of the village which still prioritizes social elements such as mutual help when they need help although this is done without bonding. The utilization of social capital for rural farmers and fishermen is an alternative that is very important in order to cover the tendency of the decrease in natural resources of Limboto Lake. According to DFID (1999), social capital shows how households have interaction with other communities in their social environment. Social capital is considered to enhance mutual trust and reduce the cost of working simultaneously.

Physical capital is a means or facilities owned by the respondents to live their life. The results of the research regarding the physical capital are home ownership, agricultural production tools, fishing gear, majority of which are self-owned. Other considerable assets are televisions and mobile phones, and motorcycles, an inexpensive means of transportation and used to sell around. Gold is owned in the form of jewelry which can be sold or pledged when they need money. According Scoones, 1998; DFID. 2000, the control of the physical resource assets is an illustration of the ease of access in the form of facilities and infrastructure that support household to survive.

Financial capital available to rural households comes from the results of agricultural, fishery and livestock products. They can also use formal and informal credit to complete their financial resources. The other financial capitals are saving and debt. Debt of the households is another attempt to meet the need of life or business capital. The debt is obtained from bank for those who have collateral. For those who do not have physical collateral in the form of house or land, they borrow from moneylenders or family guaranteed with their agricultural products. In addition to relying on debt, the majority (52.55 percent) of households receives government assistance.

The access of farmers and fishermen to financial capital vary greatly depending on the type of needs and openness to opportunities. For the capital needs of farming or fishing or other businesses better utilize capital for the bank that has a guarantee. For those who do not have collateral, they borrow from moneylenders. In order to meet their daily needs, farmers and fishermen receive debts from neighbors, relatives, shop or trader. Social assistance and relationships serve as a savior valve for households to survive.

Household Livelihood Strategies

Livelihood strategies of households are adjusted to the diversity and characteristics of the population existing in the field and added to the strategy to each household that reflects the involvement of the households into their economic activity. The results of research are shown in Figure 2 below.

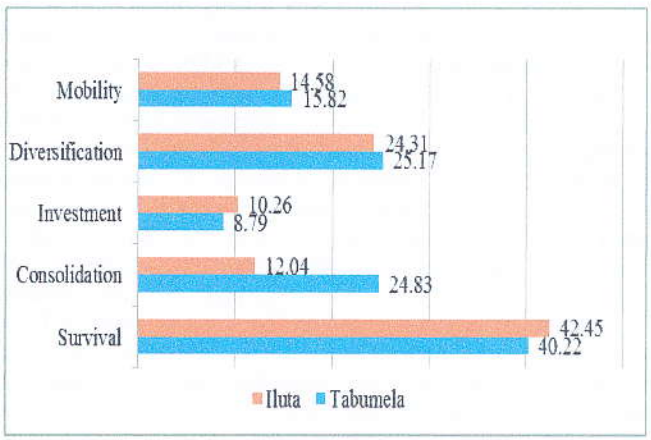

FIGURE 2

PERCENTAGE OF HOUSEHOLD LIVELIHOOD STRATEGIES

Survival strategy is a minimum strategy performed by households in various ways for survival, by: 1) meeting the minimum need of life by trying to control consumption and expenditure (all actions to limit expenditure). The restriction of expenditure is done to the types of food, especially rice. It is common for people to consume rice; in the period of shortage of food people mix rice with processed corn called *Baalibinthe* to be made into edible food; 2) Substitution is the replacement of old to new source of economic activity, and has better function/ benefit, and at least is able to provide income equal to the previous earnings , even bigger; 3) utilization of land by planting short-term and fast-harvest plants to meet the needs, which is known as *halabolu*.

Consolidation strategy is a strategy to maximize revenue that households have passed the level of security of more than just survive. This strategy is to avoid or anticipate the insufficiency for subsistence or sudden needs. Households utilize yard, pawn goods, debt, utilize labors of household members and social networks.

Investment strategy is carried out by households by utilizing the obtained excess (surplus) to develop business. This strategy is efforts to accumulate capital as a way of ensuring the survival of the household expansively. Business expansion can only be performed by households which have ample land and fish farming as well as having considerable assets and capital. Accordingly, they can increase capital and improve welfare better.

Diversification strategy is diversifying sources of income or applying double job pattern. The diversity of work is like a farmer working as a fisherman and vice versa, is also looking for additional income by selling fish and vegetables or selling fish in the traditional market, transport business of *bentor* from afternoon to evening; breeding, selling vegetables around, planting corn and horticultural crops. Therefore, the results of the other livelihoods are complementary, meaning that if there is a surplus or an immediate need from other livelihood, it can be covered by income from other livelihoods. Diversification strategy is done to anticipate if there is a decrease in sources of income, by doing various jobs which is at least able to cope with the expenditure needs of households and to live prosperously.

Households perform mobility strategy as an option if there are no jobs in the village such in the period of famine or disaster. In general households perform seasonally circular mobility by working in the same sector. Farmers go elsewhere to make a living, especially during the planting season and at harvest rice or corn in other designated villages. This is usually performed in groups to work together. Furthermore, fishermen take advantage of fishing gear such as nets and motorboats, at least once a month to catch fish in the sea which is done in the season of *nike* (such as natural dry fish) lasting for approximately 10 days and done in group.

The correlation of demographic factors and livelihood assets with livelihood strategies.

Structural equation model analysis employed Partial Least Square software. Testing the data validity and reliability for reflective indicators (variables of livelihood assets and livelihood strategies) was conducted using convergent and discriminant validity. Convergent validity can be assessed by considering the composite reliability, Average Variance Extracted (AVE), and Cronbach's Alpha. The results of loading values in the indicators of Livelihood Assets (X_2) and Livelihood strategies (Y) meet the requirements as valid indicators with loading values of > 0.7.

In order to perform the measurement model test on the social demographic variables (X_1) as formative indicators, outer weight value was assed. The test results for outer weight values for $X_{1.3}$, $X_{1.4}$, $X_{1.5}$, and $X_{1.6}$ were not significant, or <1.98, so that they were excluded from the analysis model. Furthermore, three indicators of $X_{1.1}$, $X_{1.2}$, and $X_{1.7}$ were re-tested. The come re-testing was done until meeting the convergent validity, as shown in the figure below.

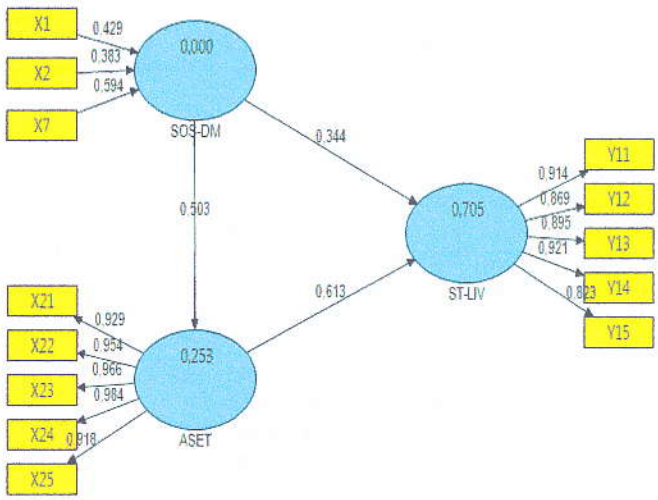

FIGURE 3

PATH DIAGRAM AFTER THE SELECTION OF INVALID INDICATORS

The testing of convergent validity indicated that basically all the indicators for each variable in the convergent validity are significant, because it has value of t statistic greater than 1.98 and loading factor greater than 0.5. The values of Composite reliability (> 0.7), Average Variance Extracted (AVE) (> 0.5), and Cronbach's Alpha (> 0.7) are as expected which has good reliability, meaning that each variable had a good level of consistency of measurement.

The testing results of weight indicator value for demographic variable which is formative variables from the results of retesting to the three indicators, namely $X_{1.1}$ (0.4289), $X_{1.2}$ (0.3833), and the $X_{1.7}$ (0.5938) with t-statistic of > 1.98. It can be concluded that all three formative indicators are valid to measure social demographic variable (X_1).

The results of structural model evaluation (Inner Model); the model of correlation of the influence of socio-demographic variables on the livelihood assets was weak. This is indicated by R-square value of 0.2532. These values indicate that the diversity of livelihood assets variable is only able to be explained by demographic variables including age, number of children, and income level by 25.32 percent. Furthermore, the correlation model of the influence of the social demographic variables (X_1) and livelihood assets (X_2) on livelihoods strategies (Y) is good. This correlation is indicated by R-square value of 0.7055,

meaning that the variation in the construct of livelihood strategies (Y) is able to be explained by socio-demographic variables (X_1), and livelihood assets (X_2) by 70.55 percent, while the remaining 29, 45 percent is influenced by other variables that are not included in the model.

The coefficient values of path parameters for the significance of the correlation of the influence between variables on the structural model are as shown in Table 5, as follows:

TABLE 5
PATH COEFFICIENTS (MEAN, STDEV, T-VALUES)

Correlation between Samples	Original Sample	Standard Deviation	Standard Error	T Statistics	Remark (> 1,98)
ASET (X_2) -> ST-LIV (Y)	0.6126	0.0459	0.0459	13.3430	Significant
SOS-X_1 (X_1) -> ASET (X_2)	0.5032	0.0508	0.0508	9.9089	Significant
SOS-X_1 (X_1)-> ST-LIV (Y)	0.3438	0.0417	0.0417	8.2464	Significant

Source: *Results of data processing*

V. CONCLUSION AND SUGGESTIONS

Conclusion

1. Age is one of the important demographic variables. Households mostly belong to productive age, have 2 to 4 children who are dependents in the households, have low education levels, and have income which is only sufficient for household consumption expenditure.
2. The levels of accessibility to livelihood assets vary in each household depending on the five components of assets, as well as the value of these assets for the benefit of livelihood. Livelihood assets include human capital, natural capital, social capital, physical capital and financial capital. The more control of assets households do, the more varied household livelihood strategies will be.
3. The overall livelihood strategies indicate that farmers and fishermen in the research location apply different livelihood strategies. Farmers and fishermen mostly apply survival strategy, then diversification, consolidation, mobility, and investment.
4. Age, number of children and income which are socio-demographic factors and five capitals of livelihoods are correlated with household livelihood strategies.

Suggestions

1. In regard to the demography, it is necessary to limit the number of children; the number of dependents can affect the choice of livelihood strategies that will be carried out for livelihood sustainability.
2. It is necessary to give skills training for residents. Low levels of education will create the mindset of fishermen and farmers that they are unable to do other works as a secondary job in order to improve their lives.
3. The financial ability of households will affect the process of meeting the food needs of the household. Therefore, supports from the government are needed to create programs for adaptation to the change of Limboto Lake for the people living around it, create jobs if harvests and catches cannot meet the needs of life for farmers and fishermen. It is expected that farmers and fishermen do not merely survive and perform diversification and mobility, but are able to move to the consolidation and expansion strategy as a business investment.

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