

# The Level of Welfare of Fish Farmer Floating Net Cage Culture Around the Lake in Gorontalo Regency, Indonesia

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**Abstract:-** The research activity was carried out in September 2018 at the Limboto Lake in Iluta Village, Batudaa Sub-District, Gorontalo Regency. The reason for choosing the location is that the people who cultivate fish in floating net cage-culture in Iluta Village are the Relatively large formulation problem in research this is how the level of welfare of fishermen floating cages in Lake Village Iluta Limboto Batudaa Subdistrict of Gorontalo regency. The purpose of this study was to determine the level of welfare of fishermen floating cages in the Lake Village Iluta Limboto Batudaa Sub-district of Gorontalo Regency. Data collected in the study consisted of primary data and secondary data. The difference between the techniques of collecting primary data and secondary data. Total population in this study is the owner of 90 business units tilapia culture in floating cages in Lake District region Limboto Gorontalo Regency (Data Department of Agriculture, Animal Husbandry and Fisheries Gorontalo Regency, 2015). Samples taken are all of the population (90). This is in accordance with the opinion of Ashari (2011), the sampling technique. If the number of the subject is less than 100 better take all. However, if a large number of subjects can be taken between 10-15% or 20-25%. Primary data, that is data obtained directly in the field by means of observation, interviews with the respondents using a questionnaire. This study used the survey method. Survey method studies that measure symptoms exist without investigating, why these symptoms exist (Mudlofar 2012). survey research is a type of research that takes a sample of the population and the questionnaire as the principal means of data collection. Sekunder data namely data obtained from various sources or agencies associated with this study, local government, the Department of Agriculture Livestock and Fisheries Gorontalo Regency, and literature related to the research, quantitative data about prosperity level fish farmer analyzed by giving score to indicators of well-being fish farmer that consist of indicators welfare according to Statistics Center (2015).

**Keywords:-** *The Level of Welfare Net Cage-Culture, Limboto lake. Gorontalo Regency.*

## I. INTRODUCTION

Limboto lake is one of the potential natural resources owned by Gorontalo Province at this time. Limboto Lake has a role as a source of income for fishermen, flood prevention, irrigation water sources and tourism objects. The lake area is in two regions, namely 30% of Gorontalo City and 70% in Gorontalo Regency and reaches 5 sub-districts. Limboto Lake is now in a very worrying condition because it experiences a process of shrinkage and siltation due to sedimentation that threatens its existence in the future. The decreasing area of lake waters causes the decline of the lake's function as a water catchment area which has the potential for floods and droughts around the lake area even outside the Lake Limboto area (Ministry of Environment of the Republic of Indonesia, 2011).

### A. Geographical Location

Limboto Lake is located in the watershed of Bone Bolango River which lies at an altitude of 4.5 m above sea level (asl) with an area of 3000 ha based on a 2002 study. In 1962 the area of Lake Limboto was 4,250 ha. This is an ecosystem degradation that is very concerning (BALIHRISTI, 2013). Limboto Lake has a very important economic role for the community, especially fish farmers. The lives and livelihoods of fishermen depend on the results generated by cage culture (KJA), the income they cannot afford. The lives of fishermen have always been declared backward, both in terms of livelihoods and traditional ways of thinking and attitude. The description of the fishing community above also occurs in the fishing community of Iluta Village, Batudaa sub-district, Gorontalo Regency. Types of fish farmed in the system in the village of Iluta most are tilapia and carp. In addition, a group of fishermen in the lake area Limboto also conduct fishing activities such as tilapia, carp, koan, bai mango, hulu'u, payangga (lokal name), and shrimp that live in the wild using fishing gear, nets and gill nets (Krismono, et al, 2008). Socio-economic conditions of coastal communities around 30-64% Limboto Lake livelihood as a fisherman, Limboto lake is one of the waters used as sources of good fisheries and aquaculture fisheries since the first (the Goddess, 2013). But for this information on the impact of farming activities, especially with net cage culture technology for the welfare of fish farmer in Lake Limboto not many. based on background back in on, the author takes title research "The level of welfare of fish farmer floating net-cage culture around the lake in Gorontalo Regency, Indonesia.

## II. METHODS

Data collected in the study consisted of primary data and secondary data. The difference between the techniques of collecting primary data and secondary data. Total population in this study is the owner of 90 business aquaculture units tilapia in floating cages in lake district region Limboto Gorontalo Regency (data Department of Agriculture, Animal Husbandry and Fisheries Gorontalo Regency, 2015). Samples taken are all of the population (90). This is in accordance with the opinion of Ashari (2011), the sampling technique. If the number of the subject is less than 100 better take all. However, if a large number of subjects can be taken between 10-15% or 20-25%. Data primer, that is data obtained directly in the field by means of observation, interviews with the respondents using a questionnaire. This study used the survey method. In survey method Studies that measure symptoms exist without investigating why these symptoms exist (Mudlofar 2012). Survey research is a type of research that takes a sample of the population and the questionnaire as the principal means of data collection. Secondary data namely data obtained from various sources or agencies associated with this study, local government, the department of agriculture livestock and fisheries Gorontalo Regency, and literature related to the research, Data quantitative about prosperity level fish farmer analyzed by giving score to indicators of well-being fish farmer that consist of indicators welfare according to Body Statistics Center Center (2015).

## III. RESULT AND DISCUSSION

Limboto lake river watershed is located in Gorontalo Regency which lay at a height of 4.5 m above sea level (asl) with an area of 3000 ha, based on research in 2002. In 1962 the lake area of 4,250 ha Limboto. This is a very poor ecosystem degradation (BALIHRISTI, 2013). Depreciation breadth and depth of the lake Limboto can be seen in Table2,

Year	Area (ha)	Depth (m)
1932	8,000	30
1970	4,500	15
2003	3054.8	4
<b>2010</b>	<b>2537.2</b>	<b>2-2,5</b>

Table 1:- Depreciation breadth and depth of the lake limboto (Source: BALIHRISTI, 2013)

Depreciation and physical silting Limboto lake also cause deterioration of aquatic biota populations and species of the lake. Production 1977 amounted to 2,960 tons catches and catch live in 2007 production of 616 tons. This is equivalent to a decline in production catches up to 2,344 tons or 79.19% within 20year. while production Limboto lake fishery in 2010 totaled 457 to (BALIHRISTI, 2013).

Various community activities in and around the lake also threaten the region and worsen the preservation of the lake. Community activities around the lake that threaten the lake functions which agricultural activity (with an area of 637 ha of rice fields and fields 329 ha), settlement area covering 1,272 ha, and the other about 42 ha. While activity in the area of the lake or body of water that is the extent of Bibilo area of about 131 ha (BALIHRISTI, 2013).

### A. Social, Economic and Cultural Rights

One of the social factors that influence economic and cultural factors is the population factor. Administratively Limboto Lake is surrounded by seven sub-districts. Namely Limboto Sub-district, West Limboto, Telaga, Tilango, Telaga Biru and Batudaa which are Gorontalo regencies as well as West City which is the territory of Gorontalo City. The highest population in 2008 was found in Limboto sub-district with a population of 68,314.

The number of people living in the villages around the lake is 50 930 people (about 11%), but when viewed density tends to be higher, at 542 inhabitants / km<sup>2</sup>. Utilization Lake Limboto the Dutch colonial period seen with the harbor and the fish market building. Building the port and the fish market was established in 1932 and used as fish auctions from Limboto Lake (Ministry of Environment of the Republic of Indonesia, 2011),

Limboto Lake is very proud people of Gorontalo as well as a source of livelihood is also a tourist attraction that has a beautiful panorama, especially when seen from the top of the hill that is around him. Other elements ecosystems outside the biotic and abiotic factors are culture (culture) is the distribution of population, livelihood, and lifestyle of the people, which is an integral part and will also affect the structure of ecosystems in a vulnerable position in a river basin. The structure and dynamics of ecosystems is a result of the change process (Ministry of Environment of the Republic of Indonesia, 2011),

### B. Welfare Analysis

#### ➤ Household Income

Revenue in each household in the Iluta village subdistrict of Gorontalo Regency comes Batudaa of income business *net cages culture*.

Commentary	Number (RTN)	Weight	Total Score
<b>Income of Fishermen</b>			
a. > Rp. 10,000,000	16	3	48
b. > Rp. 5000000-10000000	15	2	30
c. <Rp 5,000,000	59	1	59
Total			137
<b>Indicator Scores</b>	<b>90</b>		<b>1.52</b>

Table 2:- Results of Calculation of the Total Score for Indicators of Income

Average income fish farmer in the Iluta Village Batudaa sub-district of Gorontalo district of USD 7150222/ Month (Appendix 3). Fish farmer en with income above Rp 10,000,000 that there are 16 people who income of between Rp. 5000000-10000000 15 men and income less than Rp. 5,000,000 there are 59 people. When viewed from this condition means that the income of fishermen still below the highest point again and is still below Rp. 5,000,000 / month. result calculations show that the total

score of indicators of income that is 1.52.

➤ *Total Expenditure Household*

Spending consumption consists of spending non-food and food expenditure. Spending consumption the influential to welfare fishing families. Food expenditures consist of rice, sugar, coffee, tea, etc. and non-food expenditures consist of recreation, education, health. Can be seen in Table 3 below and can be found in Appendix 3.

Commentary	Number (RTN)	Weight	Total Score
<b>expenditure fisherman</b>			
a. > Rp. 2,000,000	22	3	66
b. > Rp. 1000000-1500000	21	2	42
c. <IDR. 850,000	47	1	47
			155
<b>Score indicator</b>	<b>90</b>		<b>1.72</b>

Table 3:- Results of Calculation of the Total Score for the Indicator Expenditure

The type of expenditure calculated is the average expenditure for household consumption of fishermen is Rp. 1,612,528 / month (Appendix 4 + Appendix 5: 2) and non-food items Rp. 2,000,000 / month for each fisherman. Fishermen with expenses above Rp. 1,612,528 there were 22 people who spent between Rp. 1,000,000 - 1,500,000 there are 21 people and those who spend less than Rp. 850,000 there are 47 people. If seen from this condition, it means that fishermen's expenditure is still below. The

calculation results show that the total score of the expenditure indicator is 1.72.

➤ *Type of Residence*

The welfare of home stairs is house or circumstances where stay. more and better condition house occupied by something house stairs similarly the more prosperous the household. Can be seen in Table 4 below:

Commentary	Number (RTN)	Weight	Total Score
place of residence			
a. very good	36	3	108
b. Well	30	2	60
c. moderate	24	1	24
			192
<b>Score indicator</b>	<b>90</b>		<b>2.13</b>

Table 4. Indicators of the State of Residence of Fishermen

One indicator of the well-being of a household is the home or the state of residence. The better the condition of the house occupied by a household, the more prosperous the household can be said. According to the Central

Statistics Agency (2015), a house is said to be poor if each house has a floor area of less than 8 m<sup>2</sup>. Based on this explanation, the floor area of the respondents in Iluta Village, Batudaa sub-district, Gorontalo Regency, averaged

more than 8 m<sup>2</sup>. So that the 3rd indicator can be said to be in accordance with the socio-cultural conditions of the local community and can be applied as one of the indicators of poverty in Iluta Village, Batudaa sub-district, Gorontalo Regency.

#### ➤ *Residence Facilities*

The comfort of a place to live is adequate housing facilities. The lighting source used by fishermen in Iluta Village, Batudaa Sub-district, Gorontalo Regency has all used lighting from electricity in their homes. Can be seen in table 5 below.

<b>Commentary</b>	<b>Number (RTN)</b>	<b>Weight</b>	<b>Total Score</b>
<b>Living Facilities</b>			
a. very good	36	3	108
b. Well	30	2	60
c. moderate	24	1	24
			192
<b>Score indicator</b>	<b>90</b>		<b>2,13</b>

Table 5:- Indicators of Fishermen Living Facilities

False one size from comfort stay is amenities the place stay sufficient. Source lighting used fisherman Village Iluta Batudaa sub-district of Gorontalo regency has been entirely using illumination from electricity at home each. Whereas the source of fishing in Iluta Village, Batudaa Subdistrict, Gorontalo Regency originates from regional water companies, wells, springs, and rivers. For bathrooms, there are those who use their own rooms and public bathrooms. Whereas used fuel used by fishermen in Iluta Village, Batudaa sub-district, Gorontalo Regency has used up to 3kg of gas. The fishing households of Iluta Batudaa Village, Gorontalo District, with all efforts to floating net cages, already have good and quite good living facilities.

Fishermen with residential facilities that are categorized very well there are 36 people who 30 people said to be good and that said were 24 people. The calculations show that the total score indicator residential facilities are 2.13.

#### ➤ *Healthy Household*

Household health which is the number of household members often experiences pain in one month. Can be seen in Table 6 below.

<b>Commentary</b>	<b>Number (RTN)</b>	<b>Weight</b>	<b>Total Score</b>
<b>Household Health Indicator</b>			
a. very good	40	3	120
b. Well	30	2	60
c. Not good	20	1	20
			200
<b>Score indicator</b>	<b>90</b>		<b>2,22</b>

Table 6:- Indicators of Household Health Fishermen

A fish farmer with household health are categorized very well, there are 40 people who 30 people said to be good and that 20 people. The calculations show that the total score of health indicators, namely 2:22 households.

#### ➤ *Easiness Utilization*

Easiness in health services supported by the clinic. Can be seen in Table 7 below.

<b>Commentary</b>	<b>Number (RTN)</b>	<b>Weight</b>	<b>Total Score</b>
<b>Ease of use Health Services</b>			
a. Very easy	85	3	255
b. Easy	5	2	10
c. Not easy	0	1	0
			265
<b>Score indicator</b>	<b>90</b>		<b>2,94</b>

Table 7:- Indicators ease of utilization of health services

Fishermen with household health that are categorized very well there are 40 people who are said to be good there are 30 people and those who are 20 people. The calculation results show that the total score of household health indicators is 2.22.

➤ *Family Education Quality*

Education constitutes factor the dominant for lift human of various lag including poverty. Education apart gains intelligence in the form of skills mindset, also gains insight new that will help effort lift dignity their life. Can be seen in Table 8 below.

<b>Commentary</b>	<b>Number (RTN)</b>	<b>Weight</b>	<b>Total Score</b>
<b>Quality Indicators Education Fisherman</b>			
a. High School	9	3	27
b. Junior High School	26	2	52
C. Elementary School	55	1	55
			134
<b>Score indicator</b>	<b>90</b>		<b>1.49</b>

Table 8:- Indicators of Educational Quality Fishing

The Fish farmer with education up to the stage of High School 9 people who are junior high school are 26 people and only up to elementary school graduates, there are 55 people. The calculation results show that the total score of the indicator of the quality of family education is 1.49.

➤ *Ease of Entering Children to Study Education*

Ease of fishermen in the insert children to an education is also not an issue with value score Average 3. In terms of cost, distance to school, and procedures acceptance easy. Can be seen in Table 9 below.

<b>Commentary</b>	<b>Number (RTN)</b>	<b>Weight</b>	<b>Total Score</b>
<b>Indicators Ease</b>			
<b>Put Children</b>			
<b>To Education</b>			
a. Very easy	50	3	150
b. Easy	30	2	60
c. Less easy	10	1	10
			220
<b>Score indicator</b>	<b>90</b>		<b>2.44</b>

Table 9:- Indicators ease of getting children into education

Ease of fishermen in entering children into education considered very is there an easy 50 people 30 people and less easily 10 people. The calculations show that the total score of the ease of getting children into education is 2,44

## C. Analysis of Welfare

No	Indikator	Skor	Weight/%	weight score
1	household income	1,52	24,00%	0.36
2	Household expenses	1,72	18	0.31
3	State of residence	2,13	9	0.19
4	Salinity of residence	2,13	9	0.19
5	Household health	2,22	8	0.18
6	Ease of use of health personnel facilities	2,99	12	0.36
7	Education quality	1,49	12	0.18
8	Ease of entering children into education	2,44	8	0.20
	<b>Total</b>	<b>16.64</b>	<b>100</b>	<b>01.01.09</b>

Table 10:- Analysis of the level of welfare

Table of welfare level that fish farmer households in Iluta Village, Batudaa sub-district, Gorontalo Regency have a score of 1.97. Based on the criteria for determining weights referring to the determination of welfare according to the Indonesian Central Bureau of Statistics (2015), it can be stated that the welfare level of the fish farmer in Iluta village, Batudaa sub-district, Gorontalo Regency is in the category of moderate welfare level. This is appropriate for determining the level of welfare which is grouped into 3 parts, namely a score between 2.61 - 3.41 (high welfare level), b. The score between 1.81 - 2.60 (moderate welfare level), and c. The score between 1.0 - 1.80 (low welfare level). According to Sugiyono (2008) if the score shows 1.81-2.60 then the weight is taken 24%, the results are generated from 16 divided by the number of fish farmer and multiplied by 100, if the score is 1.52 then the weight is taken from half 100%, 24 %. Likewise, with the weight of 18% and up to 8%, the total weight is 100%.

## IV. CONCLUSION

Based on the results of this study concluded that the level of welfare of *net-cage culture* in the village Iluta Batudaa Subdistrict of Gorontalo Regency included in the medium category with a score of **1.97**.

Enterprises floating cages in Lake Village Iluta Limboto potential to be developed then the government should give attention to the problems that occur in areas with businesses *cage-culture* in Lake Village Iluta Limboto, Batudaa sub-district like lake pollution, counseling and capital support for the provision of production facilities for the welfare of fish farmer in the future.

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