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LEVEL OF WILLING FOR RELOCATION OF FARMERS IN PUSONG RESERVOIR, BANDA SAKTI SUB-DISTRICT LHOKSEUMAWE CITY

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ABSTRACT

The decline in water quality in the Pusong reservoir, Banda Sakti sub-district, Lhokseumawe city, has made the Lhokseumawe City Government try to improve the reservoir's water quality by planning a policy for relocating fish cage farmers from the Pusong reservoir to another place. This study aims to identify the characteristics of the Pusong reservoir farmers, and identify the level of willingness to relocate the Pusong reservoir farmers. This research uses a descriptive method. The subjects in this study were the farmers of the Pusong reservoir, which consisted of 53 farmers from the village of Pusong Lama and 21 farmers from the village of Keude Aceh. The results of the study showed that there were differences in characteristics between the farmers of Pusong Lama Village and Keude Aceh Village, namely in the classification of the age of the farmers and the length of time they had been pondering. Farmers in Pusong Lama village are dominated by farmers aged 40 to 49 years, while farmers in Keude Aceh village are dominated by farmers aged 30 to 39 years. The farmers in Pusong Lama Village are dominated by farmers who have ponded in the Pusong Reservoir for 11 to 15 years, while the farmers in Keude Aceh are dominated by farmers who have ponded for 1 to 10 years. The level of willingness to relocate farmers in the old Pusong village shows that 49% of farmers stated that they strongly disagree and 35% of farmers stated that they did not agree with the policy planning for the relocation of the Pusong reservoir. The level of willingness to relocate farmers in the old Pusong village showed that 56% of the farmers stated that they strongly disagreed and 11% of the farmers stated that they did not agree with the policy planning for the relocation of the Pusong reservoir. while the farmers in the village of Keude aceh are dominated by farmers aged 30 to 39 years. The farmers in Pusong Lama Village are dominated by farmers who have ponded in the Pusong Reservoir for 11 to 15 years, while the farmers in Keude Aceh are dominated by farmers who have ponded for 1 to 10 years.

Keywords: ***Farmers, Reservoir, Relocatio***

1. INTRODUCTION

Reservoirs are artificial fresh waters, which are built by damming rivers. In general, the existence of reservoirs has several functions, including being able to accommodate large amounts of rainwater, so as to prevent flooding. In several places, reservoirs are also used as power generators, water supplies for agricultural irrigation, tourism objects and fishery activities, both capture fisheries and aquaculture. This shows the many potentials and benefits of reservoirs (Apriyanti, 2008). According to Fudikoa (2021), the use of reservoirs in various community activities, both in the watershed leading to the reservoir, around the reservoir, and in the body of the reservoir can reduce the quality of reservoir water. The decline in reservoir water quality is generally caused by industrial activities by dumping waste into reservoirs, disposal of household waste, and floating net fish farming (KJA). According to Degefua, et al (2011), there is a strong

relationship between growth in cage culture and water quality. The application of fishery activities that are not environmentally friendly such as floating net cages (KJA) that exceed the carrying capacity of the environment, and improper cultivation techniques such as feeding that is not suitable will leave leftover feed that accumulates on the bottom of the waters making the water quality unfavorable (Pujiastusi, et al., 2013). The Pusong Reservoir in Lhokseumawe City is a reservoir that has experienced a decrease in water quality. The Pusong Reservoir was built in 2007 with an area of 60 hectares, the construction of which was a program of the Aceh and Nias Rehabilitation and Reconstruction Agency (BRR) using the Multi Fund Fund (MDF) and the State Revenue and Expenditure Budget (APBN) in 2008, 2009 and 2010 The construction of the Pusong reservoir is expected to overcome flooding in the city of Lhokseumawe, especially in the Banda Sakti sub-district which is an urban area (Khatab, 2014).

Pusong Reservoir is also used as agricultural cultivation land. The type of agricultural cultivation developed by the community is the cultivation of traditional floating net cages or floating net cages. The people who live in cages in the Pusong reservoir are people from the old Pusong village and the village of Keude Aceh, because these two villages are directly adjacent to the Pusong reservoir. In July 2022, the Lhokseumawe City Government made a policy plan, in the form of a policy planning for the relocation of cage cultivation land from the Pusong reservoir to another place. The planning for this relocation policy was conveyed by the Lhokseumawe City Government through a letter submitted to the village head of Pusong Lama and village head of Keude Aceh which was then delivered to all fish farmers. This policy was made due to laboratory tests being carried out by the Pidie Regency Environmental Service on water in the Pusong reservoir area in 2022. Sampling was carried out at three points, with the aim that it would be representative of the entire reservoir area. Parameters tested included TSS, TDS, pH, BOD5, COD, Lead (Pb), mercury (Hg) and ammonia.

Research on reservoir relocation was previously carried out by (Rahayu and Angyaputeri, 2017), examining studies of the quality of life of the Pluit reservoir community after relocation activities. This study suggests the importance of the concept of quality of life in policy implementation or planning, so that it can identify a problem, make policies, programs, and in monitoring and evaluating the implementation of plans. This study aims to identify the level of willingness to relocate the farmers of the Pusong reservoir, and identify the characteristics of the farmers of the Pusong reservoir which consist of farmers from Pusong Lama village and farmers from Keude Aceh village. It is hoped that this research can be a means of information and input to the Lhokseumawe City Government in carrying out policy planning for the relocation of the Pusong reservoir, Banda Sakti sub-district, Lhokseumawe City.

2. LITERATURE REVIEW

2.1. Reservoir

Reservoir is defined as a place on the ground surface that is used to store water when there is excess water/rainy season, so that water can be utilized during the dry season (Setyantiningtyas, 2010). According to Apridayanti (2008), Reservoirs are artificial fresh waters that can be made by humans, to create a reservoir can be done by damming certain rivers. Usually the construction of reservoirs is carried out for several purposes such as flood prevention, power generation, water supply for agricultural irrigation needs, for fishing activities both capture fisheries and cage cultivation and even for tourism activities. Thus, the reservoir can provide benefits to the surrounding community. The existence of reservoirs around the community has benefits and has great resource potential to be utilized in various aspects of human life, one of which is the development of fishing activities, capture fisheries or cage cultivation carried out by the community around the reservoir. The development of reservoir areas with fisheries certainly provides many benefits, but if the application is not carried out properly it will result in a decrease in the quality of reservoir water. The decline in reservoir water quality is thought to be due to the

large amount of organic waste left over from aquaculture feed being disposed of in the waters. The technique of giving the amount and dosage of feed that is not good, has an impact on excess feed residue which results in an unfavorable aquatic environment (Sukadi, 2016).

2.2.Relocation Policy

Relocation is defined as an effort to place a certain activity back on land according to its designation. Thus, relocation is an effort to relocate an activity/activities from one place to another which is considered more appropriate based on certain reasons and objectives (Harianto, 2001). Relocation is part of a public policy made by the government, based on the regulation of the Ministry of Maritime Affairs and Fisheries number: 37/-KEP-DJKP3K/2014 concerning general guidelines for relocation and compensation for reclamation activities in coastal areas and small islands, stating that

a. Transparent: Related activities must be informed in a transparent manner to the parties that will be affected.
b. Participatory : Potentially affected residents to be relocated or given compensation must be involved in all stages of activities, from planning to activity evaluation, such as: determining relocation locations, determining alternative livelihoods and the amount and form of compensation / compensation.
c. Fair: Relocation and compensation to residents potentially affected by reclamation must not worsen the living conditions of residents. These residents have the right to obtain adequate compensation, such as replacement land and/or cash equivalent to the market price of their land and assets.
d. Voluntary: Affected residents are given the freedom to accept selling their land or not to accept the relocation initiator's offer or compensation.
e. Holistic: Relocation and compensation activities must consider all aspects, including social, economic, environmental, cultural and local customs, regional spatial planning plans and/or zoning plans where the activities are carried out.

3. RESEARCH METHODS

This study discusses the characteristics of Pusong reservoir farmers, and the level of willingness to relocate Pusong reservoir farmers towards the Pusong reservoir relocation policy planning carried out by the Lhokseumawe City Government. This research was conducted in December 2022, by carrying out the field observation stage which aims to map the location of research points, and conduct interviews with respondents using a questionnaire. The type of research used in this research is descriptive research. Descriptive research uses the method of collecting, processing and presenting and interpreting data quantitatively or in percentages which can be presented in the form of tables or graphs. This type of research aims to see a picture of the state of the data set being studied without intending to look for relationships between data or drawing conclusions. The use of descriptive methods in this study was carried out by considering the research objectives, namely knowing the characteristics of the Pusong reservoir farmers and knowing the level of willingness to relocate Pusong reservoir farmers to the relocation policy planning carried out by the Lhokseumawe City government.

The population of this study was 278 ponds in cages in the Pusong Reservoir, Banda Sakti District, Lhokseumawe City. Sampling in this study used the Cluster Random Sampling method. Cluster Random Sampling is a sampling technique that is used when the population does not consist of individuals, but consists of groups of individuals or clusters. The use of the Cluster Random Sampling method is because, in this study, farmers were taken from two villages, namely Pusong Lama village and Keude Aceh village as research samples. To determine the number of samples performed calculations using the Solvin formula, with the following formula:

$$n = \frac{N}{1 + N\,e^2}$$

Information:
n =Number of samples
N =Total population
e =Percentage of set fault tolerance limits

Percentage error tolerance limit set is 5 %. After calculating the number of samples using the slovin formula, then calculating the cluster fraction sample using the following formula:

$$fi=\frac{N_i}{N}$$

After obtaining a sample of cluster fractions, then the number of individual clusters is calculated using the following formula:

$$Ni = fi \times n$$

Information :
Fi =Cluster fraction sample
NI =The number of individuals in the cluster
N =The total population size
n =The number of members included in the sample.
After calculating using the formula above, the results obtained are as follows:

Table 1. Total Population, Samples, Samples of Cluster Fractions, and Cluster Individuals

No	Village name	Population	Cluster break sample	Cluster Individuals
1	Old Pusong	200	0.71	53
2	Keude Aceh	78	0.28	21
	Total	278		74
	Sample	74		

Source: Primary Data (Processed), 2023.

Based on Table 1, it shows that the total population of cage farmers from Pusong Lama Village and Keude Aceh Village is 278 farmers. Then the calculation of the number of samples using the Solvin formula, obtained a total sample of 74 farmers. After calculating the population size, number of samples, and cluster splitting samples, we finally obtained the number of individual clusters for two villages, namely, the old Pusong Village of 53 farmers, and the Keude Aceh Village of 21 farmers, with a total of 74 farmers. The subjects of this study were traditional floating net cage farmers in the Pusong Reservoir, Banda Sakti sub-district, Lhokseumawe City, which consisted of farmers from Pusong Lama Village and Keude Aceh Village. This study uses primary data. Primary data is data obtained directly from research sources in the field. The primary data collection technique was carried out by means of questionnaires and field observations.

Measuring the level of willingness to relocate farmers is done by giving statements to farmers, which then farmers will answer according to the level of approval of farmers. The indicators to measure the level of willingness to relocate farmers use a Likert scale with a scale of type 1-5 as follows: Are fish cage farmers willing to be relocated from the Pusong reservoir to another place? (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). The scale is used to complete a questionnaire that requires farmers to indicate their level of agreement with this statement. The percentage of farmer response rates is calculated using the following formula:

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$$\frac{\text{The Number of Respondents'answer}}{\text{Total Number of respondents}} 100\%$$

4. RESULTS AND DISCUSSIONS

4.1. Characteristics

Characteristics of fish farmers in Pisong Lama Village, as seen from individual characteristics of farmers, characteristics of farmer families, characteristics of ponds and characteristics of farmer production. Second, obtaining the willingness to relocate fish farmers from the old Pusong village. This study took 53 farmers from Pusong Lama Village and 21 farmers from Keude Aceh Village. The characteristics of the farmers of Pusong Lama Village and the farmers of Keude Aceh Village can be seen in Table 2.

Table 2. Characteristics of Farmers

Indicator	Criteria	Old Pusong		Keude Aceh	
		Amount	Percentage	Amount	Percentage
Number of Shooters		53	100%	21	100%
Gender	• Man	53	100%	18	83%
	• Woman	0	0%	3	17%
Age (Years)	• < 30 Years	6	11%	0	0%
	• 30–39 Years	16	30%	9	43%
	• 40-49 Years	18	34%	8	38%
	• > 49 Years	13	25%	4	19%
Level of education	• SD	13	25%	6	29%
	• JUNIOR HIGH SCHOOL	15	28%	2	10%
	• SENIOR HIGH SCHOOL	22	41%	12	57%
	• Bachelor	3	6%	1	4%
Long pond (Year)	• < 6 years	7	13%	2	10%
	• 6-10 Years	19	36%	8	38%
	• 11-15 Years	22	42%	7	33%
	• >15 Years	5	9%	4	19%
The main job	• shooter	30	57%	15	71%
	• Fisherman	16	30%	4	19%
	• Other	7	13%	2	10%

Source: Primary Data (processed), 2023

All of the farmers in Pusong Lama Village who were respondents were male, while of the 21 farmers in Keude Aceh village who were respondents there were 3 female farmers. The farmers of Pusong Lama Village are dominated by farmers aged 40-49 years, while the farmers of Keude Aceh are dominated by farmers aged 30-39 years. Farmers from both villages were dominated by farmers with high school education level. The ponds in Pusong Lama Village are dominated by farmers who have been farming in the Pusong reservoir for 11-15 years, while the farmers in Keude Aceh Village are dominated by farmers who have been pondering for 6-10 years. Pusong reservoir farmers have several livelihoods apart from pond farming, there are 57% of Pusong Lama Village farmers who only have one livelihood. This study also identified the characteristics of the Pusong Reservoir farmer families. Table 2 shows that the farmers in Pusong Lama Village and the farmers in Keude Aceh Village are dominated by farmers with an income level of Rp. 1,500,000 - 2,500,000/month.This shows that the income of most Pusong reservoir farmers is classified as moderate income (BPS, 2020).

Table 3. Characteristics of the Farmer's family

Indicator	Criteria	Old Pusong		Keude Aceh	
		Amount	Percentage	Amount	Percentage
Income (Rp/Month)	• < 1,500,000	4	8%	8	38%
	• 1,500,000-2,500,000	3	70%	1	62%
	• 2,500,000-3,500,000	7	14%	3	0%
	• >3,500,000	8	8%	0	0%
		4		0	
Elderly members of the family (people)	• Farmers who have families aged over 64 years	3	74%	1	81%
		9		7	
	• Farmers who do not have family aged over 64 years	1	26%	4	19%
		4			
Toddler members in the family (Person)	• Farmers have children under 6 years	3	70%	1	57%
		7		2	
	• Farmers do not have children under 6 years	1	30%	9	42%
		6			
house structure	• Concrete structure	3	6		7
		6	8%	5	1%
	• Not concrete structure	1	32%	6	29%
		7			
Home Ownership Status	• Private property	5	94%	2	95%
		0		0	
	• rent	3	6%	1	5%
Length of stay (Year)	• < 6 years	0	0%	0	0%
	• 6-10 Years		0%	0	0%
	• 11-15 Years	5	8%	0	0%
	• >15 Years	5	91%	1	100%
		1		8	

Source: Primary data processed in 2023

With an income level that is in the moderate category, the farmers of Pusong Lama Village and the farmers of Keude Aceh Village are both dominated by farmers who also have dependents

of elderly family members over 64 years old, and have dependents of family members under 6 years old. The farmers of Pusong Lama Village and the farmers of Keude Aceh Village are dominated by farmers who have residential buildings with concrete structures, with private ownership status.Almost all of the farmers in Pusong Lama Village are native to the village, so they have lived in the village for more than 15 years. All farmers in Keude Aceh Village have lived in the village for more than 15 years.

Table 4. Characteristics of Pusong Reservoir Cage

Indicator	Criteria	Old Pusong		Keude Aceh	
		Amount	Percentage	Amount	Percentage
Ownership status	• Private property	53	100 %	21	100 %
	• Owned by others	0	0%	0	0%
Number of cages	• < 10 units	22	42%	13	62%
	• > 10 units	31	58%	8	38%
Cage Size	• Size (3m x 3m)	11 25	21%	4 0	23%
	• Size (4m x 5m)	20 26	37%	4 5	26%
	• Size (5m x 5m)	10 01	18%	5 0	29%
	• Size (3m x 4m)	13 50	25%	3 1	18%
Cage Making Costs	• < 1,000,000	39	74%	19	90%
	• >1,000,000	14	26%	2	10%
Cost of materials and materials	-Nets (Rp/1 unit cage)	120,000			
	-Wood (Rp/1 unit cage)	100,000			
	-Board (Rp/ 1 unit cage)	125,000			
	-Tie strap (Rp/1 unit)	150,000			
Maintenance costs	• < 1,000,000	37	70%	18	86%
	• > 1,000,000	16	30%	3	14%

Source: Primary Data (processed), 2023

In Table 3, shows the characteristics of the cages found in the Pusong reservoir. Based on the research results, it was found that all the ponds owned by the farmers in Pusong Lama village and the farmers in Keude Aceh village were privately owned. The farmers of Pusong Lama village are dominated by farmers who have cages of more than 10 units, while the farmers of Keude Aceh are dominated by farmers who have ponds under 10 units. In order to build one unit of cages, a tool in the form of a net is required at a price of Rp. 120,000, wood Rp. 100,000, board Rp. 125,000, and

straps for Rp. 150,000. so it can be concluded that to make one unit of cages can cost under Rp. 1,000,000.

Table 5. Production Characteristics of Pusong Reservoir Cage

Indicator	Criteria	Unit	Price
Fish type	• Mujair	IDR/Kg	20,000 - 25,000
	• White snapper	IDR/Kg	60,000 – 65,000
	• grouper	IDR/Kg	70,000 – 75,000
Production	• Plastic drum	IDR/Unit	50,000
tools	• Net	IDR/Unit	120,000
	• Basket	IDR/Unit	50,000
	• Light	IDR/Unit	50,000
	• Boat	IDR/Unit	1,500,000 – 2,000,000
	• Small fish	IDR/Kg	50,000
Fish feed	• Small shrimp	IDR/Kg	80,000
	• Moss	-	-
	• Mujair	IDR/Kg	150,000 – 200,000
Fish seeds	• White snapper	IDR/Kg	200,000 – 300,000
	• grouper	IDR/Kg	150,000 – 200,000
Market	• Lhokseumawe city market	-	-
	• Collection agent	-	-

Source: Primary data processed in 2023

Table 4 shows the production characteristics of the Pusong reservoir cages. There are three types of fish that can be cultivated in the Pusong reservoir, namely Mujair Fish, White Snapper, and Grouper. Mujair fish is sold for Rp. 20,000 to Rp. 25,000/kg, White Snapper is sold for Rp. 60,000 to Rp. 65,000/kg and groupers sell for Rp. 70,000 to Rp. 75,000/kg. To carry out the production process, production equipment is needed, such as plastic drums, nets, baskets, lights, and boats. Fish feed used is small fish, small shrimp and moss. Fish that are still small in size are fed in the form of moss which can be obtained directly in the waters of the reservoir, while for fish that are already large in size they are fed in the form of small fish and small shrimp. Small shrimp are sold at Rp. 80,000/kg, and small fish are sold at Rp. 50. 000/kg. All of the production produced by the farmers of Pusong Lama village and the farmers of Keude Aceh village are sold to markets around the city of Lhokseumawe, and are also sold to collecting agents.

4.2. The level of willingness to relocate fish farmers in the Pusong reservoir

a) Level of willingness to relocate fish farmers in Pusong Lama Village

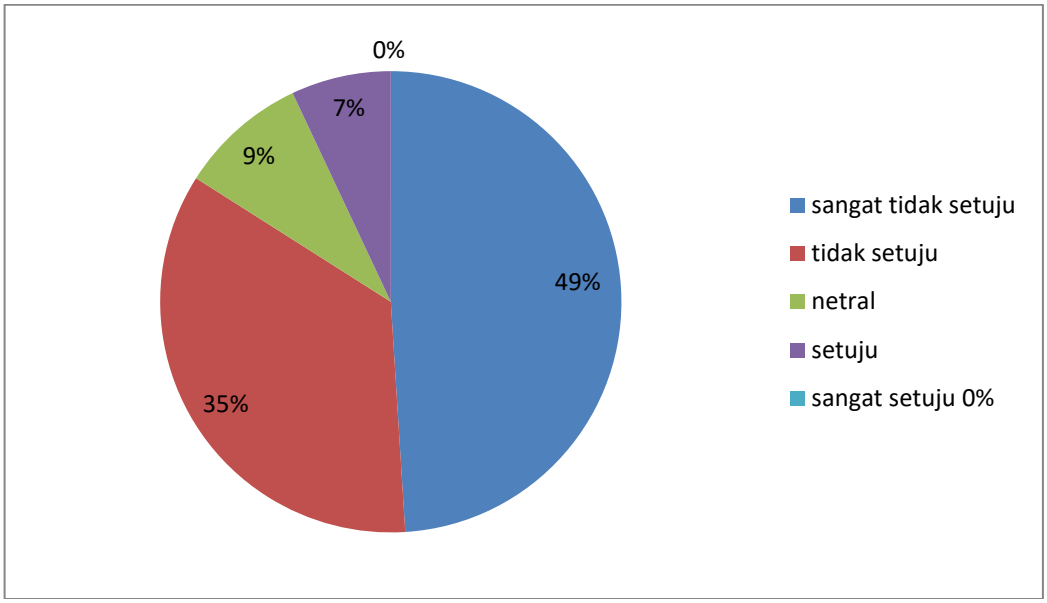

Figure 1. Diagram of the Willingness Level for Relocating Farmers in Pusong Lama Village

The diagram of the level of willingness to relocate farmers in Pusong Lama village shows that 49% of farmers in Pusong Lama village strongly disagree and 35% of farmers say they disagree with the planning for relocating the Pusong reservoir carried out by the Lhokseumawe City government.

b) Level of willingness to relocate fish farmers in Keude aceh village

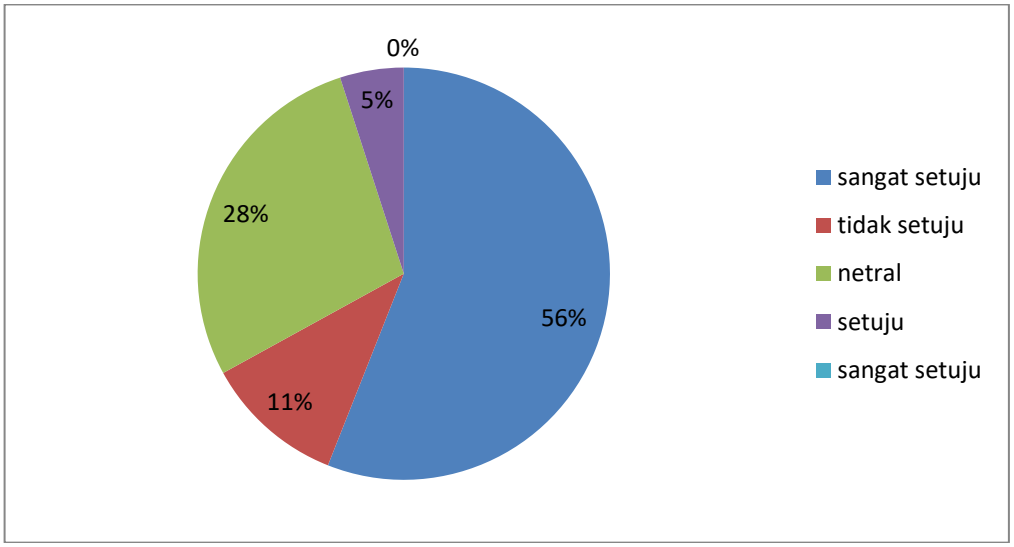

Figure 2. Diagram of the level of willingness to relocate fish farmers in the village of Keude Aceh

The diagram of the level of willingness to relocate farmers in Keude Aceh village shows that 56% of farmers in Pusong Lama Village strongly disagree and 11% of farmers stated that they did

not agree with the relocation planning carried out by the Lhokseumawe City government. The results of this study indicate that there is still a high level of rejection of the relocation policy planning carried out by the Lhokseumawe City Government for Pusong reservoir farmers. The results of this study are expected to be input, information and reference to the Government in planning the Pusong Reservoir relocation policy.

The reasons for rejecting the planned relocation policy carried out by the Lhokseumawe City Government for the Pusong reservoir farmers can be grouped into 4 groups. First, the economic factor. most of the farmers are worried about the sustainability of their livelihood in the future. They feel that building and moving cages is expensive. Second, social factors. There are two potential locations offered by the Lhokseumawe City Government, namely, the Krung Cunda River and the Loskala River. The farmers rejected the proposal because the two places offered were located outside the two original villages. The transfer of floating net cages has the potential to cause social conflict between communities. Kurnia, et al., (2020) state the social risks due to relocation, namely, wider gaps in community cohesiveness due to loss of trust, loss of social security; and demographic problems such as unemployment and crime. The third factor is the location feasibility factor. The Krueng Cunda River is not suitable for cultivating tilapia and barramundi and its location is connected to the estuary of the North Sumatran sea. The fourth factor is the distance between the new location and the farmer's domicile. The distance between the Pusong reservoir and the Loskala River is 6.5 kilometers, while the distance between the Pusong reservoir and the Krueng Cunda River is 11.7 kilometers. Distance is considered to affect production costs and theft rate. The fourth factor is the distance between the new location and the farmer's domicile. The distance between the Pusong reservoir and the Loskala River is 6.5 kilometers, while the distance between the Pusong reservoir and the Krueng Cunda River is 11.7 kilometers. Distance is considered to affect production costs and theft rate. The fourth factor is the distance between the new location and the farmer's domicile. The distance between the Pusong reservoir and the Loskala River is 6.5 kilometers, while the distance between the Pusong reservoir and the Krueng Cunda River is 11.7 kilometers. Distance is considered to affect production costs and theft rate.

5. CONCLUSION

The results of this study are as follows:

1. The farmers of Pusong Lama Village are dominated by farmers aged 40 to 49 years, while the farmers of Keude Aceh Village are dominated by farmers aged 30-39 years. The farmers of Pusong Lama Village are dominated by farmers who have ponded in the Pusong reservoir for 11 to 15 years, while the farmers of Keude Aceh are dominated by farmers who have ponded for 1 to 10 years.
2. The level of willingness to relocate farmers in Pusong Lama Village showed that 49% of farmers stated that they strongly disagreed and 35% of farmers stated that they did not agree with the policy planning for the relocation of the Pusong reservoir. The level of willingness to relocate farmers in the old Pusong village showed that 56% of the farmers stated that they strongly disagreed and 11% of the farmers stated that they did not agree with the policy planning for the relocation of the Pusong reservoir.

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