



Making fish feed by farmers wife in Nagari Limau Gadang Pesisir Selatan District West Sumatra

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Abstract

Catfish farming can serve as the main effort to increase family income. Economically catfish farming is very profitable. Catfish farming is not difficult and can be done by farmers who do not usually cultivate freshwater fish. The right family member is empowered to improve the family economy through the cultivation of catfish is the farmer's wife. Farmer's wives in Limau Gadang Nagari tend not to improve the family economy, they play the role of taking care of children, doing housework and sometimes delivering food to the fields. The farmer's wife activity is only fulfilling the wife's obligation to husband in married life. Farmers' wives are economically unproductive in improving the family economy. How to research, selected 20 poor farmer's wife then trained to make pellets. Pellet made from raw trash fish, quail feces, fine bran and cassava. The pellet formulation is made of 4 kinds. Each formulation produces a quality pellet. Based on laboratory test produced pellet contains very good nutrition for enlargement catfish. The nutritional range of protein is 21% -35% and fat is 17% -22%. Based on test of enlargement in experimental pond, obtained the best pellet result influence to weight of catfish is pellet with 40% trash fish formula, 35% quail feces, 15% fine bran, and 10% cassava. The goal to be achieved in this research is for the wife of farmers can contribute to improve the family economy. Specific targets to be achieved in this study is the wife of skilled farmers cultivate catfish, Nagari Limau Gadang population increases their living standards and TNKS in Nagari Limau Gadang free from the pressure of the population

Keywords: Farmer's Wife, Catfish, Pellet, Cultivation

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Introduction

Nagari Limau Gadang is geographically adjacent to Kerinci Seblat National Park (TNKS). Approximately 250 households have cultivated land in TNKS. Farm fields are planted with various types of plants, eg cinnamon, nutmeg, coffee, areca nut, and crops. The activities of making fields are cutting down and burning forests. As a result of logging and burning, many species of flora and fauna are threatened with extinction. Other economic activities of the people who destroy TNKS are the transporters of processed timber, taking bark of taro, taking manau, looking for gaharu and hunting animals. Economic business activities are pressuring the area of TNKS very rapidly, because the forests where they earn money to survive, without their forest can not carry on daily life. The economic activity of farming outside TNKS and planting rice in paddy fields is not sufficient to support the economy of the population. If further stimulated, conducting economic activities in the area of TNKS is not the best choice, but is escaped and forced to save the home economy.

Making a living in TNKS is high risk because the distance to pick up wood to TNKS reaches 16 km and the terrain is very dangerous. Based on interviews of researchers with 20 residents, who carry on daily activities as transporters of processed wood, all of them say bored to the forest, but circumstances force. Conducting economic activities in the village is not sufficient to meet the needs of life.

According to the researchers, Nagari Limau Gadang residents can conduct economic activities outside TNKS if the government or concerned parties and related TNKS create a choice economic business, for example poultry breeding and freshwater fish farming. All these efforts are very promising increase in the economy of the population. Nagari

Limau Gadang is a nagari in District IV Jurai whose inhabitants work as farmers. They only rely on rice fields and use resources to fulfill their daily needs. This situation has happened for a very long time. The economic condition of Nagari Limau Gadang residents is very poor, almost all Nagari Limau Gadang residents work as farmers in the rice fields and in the fields [1].

This study focuses on determining the right formula to make a quality catfish (pellet) feed. Pellet fish is expected to be made by the farmer's wife. The wife of farmers who are skilled to make the feed will be able to cultivate catfish. The cultivation of catfish by the farmer's wife will improve the farm household's economy. Increasing the family economy will reduce farmer visits to TNKS [1].

Women (farmers' wives) do not contribute directly to the family's income to support households. The wife of the farmer always helps the husband to do the job as a farmer. Economically, farmers' wives do not ease the burden of husbands' earnings [2].

The activities of Nagari Limau Gadang residents to earn a living in TNKS, eg farming, hunting and gathering of natural resources will damage the ecosystem and cause disaster. As evidence of ecosystem damage TNKS Nagari Limau Gadang, there have been river floods in 1987, 1997, and 2005. According to Yusran [3] damage ecosystem TNKS can be overcome by way of economic activity. One of the economic activities that can be done by the community is freshwater fish farming, because land and water resources are very supportive. Fish farming will improve people's economy so they will not enter the forest area.

Poverty can literally be said to be a state of not having enough. In various views there are three types of poverty that are often expressed are structural poverty, relative poverty and absolute poverty. Structural poverty is understood as poverty arising as a result of government policies and corporate behavior that make the poor, have little or no access to the productive economy. Relative poverty is a poverty that arises not only from the aspect of income but also living conditions in the social environment, while the absolute poverty according to Ferryal [4] is poverty measured from the level of ability to finance a minimum living in accordance with the dignity of human life.

Environmental damage is caused by many factors, especially human activities that are not friendly with the environment itself. Humans should be responsible for preserving the environment, but they are destroying the environment. They tend to take unlimited natural wealth causing damage. They do not care about the needs of future generations. Needs often encourage people to take natural resources TNKS on a large scale regardless of the impact. One of the main factors causing the destruction of the environment TNKS is poverty [4].

Many experts argue that poverty is one of the main causes of environmental destruction in TNKS. Environmental degradation caused by poor people tends to be influenced by their mindset because they are squeezed by poverty, their minds are focused only on the food they can get to survive today. It is this narrow-mindedness that drives them to plunder nature's resources without giving time for nature to renew resources [5].

Forest destruction due to poverty also occurs in the Kerinci Seblat Nagari National Park Limau Gadang. Kerinci Seblat National Park damage is estimated to have been quite severe, the damage has reached about 50 ha. Kerinci Seblat National Park damage includes flora, fauna and land.

Associated with fish farming, fish farmers have problems in getting cheap feed, because fish feed prices tend to increase. According to Sinaga [6] if farmers use factory feed material, the value can reach 70% of all cost components. One effort that can be done for successful freshwater fish cultivation is to make their own feed. Most fish feed

raw materials are available in Nagari Limau Gadang.

Based on research that researchers have done about the cultivation of tilapia as a model of economic activity options overcome the dependence of the population on TNKS. The results showed that the activity of tilapia fish farming can reduce the level of population visit to TNKS [1].

Researchers have also conducted training to make pellets for tilapia against youth and women in Nagari Limau Gadang. The results showed 95% of the participants trained to be skilled at making the feed [7].

Researchers have conducted a study on the ratio of the effect of homemade feed to factory-made feed to the weight of tilapia. The results showed no difference means the influence between homemade pellets with factory-made pellets [8]. Listening to the findings of relevant research, which once researchers do, the catfish cultivation research is very possible to improve the family economy. Research activities conducted are to guide, train, test and compare to get the best quality pellet. The best quality pellet produced is used as feed for catfish cultivation.

To understand the implementation of research it is necessary to understand about catfish and feed ingredients in need. Catfish began to be known in Indonesia around 1986, these catfish live wild in swamps, freshwater rivers, but now the cultivation has been carried out intensively. Catfish has a high nutrient content that consists of 17-37% protein, 4.8% fat, 1.2% minerals, 1.2% vitamins and 75.1% water, rapid growth, the fans are increasing due to the meat tasty and delicious [9].

In Indonesia catfish are known by some names according to their respective regional languages. In the area of West Sumatra called the fish kalang and in the area of Kalimantan called catfish [10]. Characteristics of this catfish can be seen from several parts of the body that is elongated body shape with a flat head, the mouth is at the end or terminal with 4 pairs of tentacles consisting of two nasal nasal fruit, mandibular tentacle in 2 pieces. Catfish have five fins consisting of double fins, which are paired with pectoral fins and abdominal fins, while unpaired are the dorsal fin, caudal fin and anal fin. On the pectoral fins are equipped with a gaff or spurs are non-toxic, when compared with local catfish, spurs catfish shorter and duller. The skin of catfish is not scaly, but slippery because of mucus. Body color like mud, the head to the back of brown to blackish, the stomach and the bottom of the head is more brighter [9].

One of the most crucial elements in the growth and mortality of fish is the availability of adequate feed, in addition to the existing natural feed, so to accelerate the growth of fish should be given nutritious food. Provision of nutrient feed can increase the production of fish maintenance up to three times compared with those not given nutritious food. Nutrient feed given to fish contains at least protein, carbohydrates and fats. All three of these substances will be converted into energy that is necessary to perform its activities, but the protein contained in a feed more determine the growth of fish than carbohydrates and fats [11].

The function of nutritious food for fish is to nourish the body, replace the damaged cells, after which the remaining excess feed is used for growth. In line with Dewi's opinion, Mudjiman [12] says that the protein present in the feed is needed by the fish as a source of energy, to replace damaged cells and to grow.

Factors that need to be considered in the provision of nutrient feed for the growth of fish is the quality of feed and the amount of feed. Protein contained in the feed is a very important element for the growth of fish. Protein is derived from animal protein and vegetable protein [12]. Nutritious food that can be given for catfish is fine bran, cassava, coconut meal, fish rucuh, quail feses.

The feed functions in the growth of fish. To grow the optimal fish re-

quired amount and quality of feed enough. The purpose of feeding produces meat in a short time. Provision of nutrient feed can increase fish production up to 3 times compared with that is not given nutritious food, then added by^[9] that with the feeding of nutritious, fish weight gain can be 25-35% every month from the beginning. The raw materials used to make catfish feed are many raw materials available in Nagari Limau Gadang. This raw material is mixed to feed catfish. The raw materials needed to make catfish pellets are (1) trash fish, trash fish is unused fish. Small fish and other types of fish not consumed by the community can be classified into trash fish. The dried trash fish contains 43% -50% protein. Trash fish can be used as a source of protein to make fish feed (pellet). Trash fish contains proteins that can be standard as a source of protein for fish and poultry feed^[13]. (2) quail feces, quail feces are waste from quailing cultivation layers. Quail feces contain 18-20% protein, 11-15% carbohydrate. Quail feces contained high protein and carbohydrate, then quail feces can be used as a source of protein and carbohydrates to make fish feed. The price of quail feces is much lower than other feed raw materials. If fish farmers utilize the nutrient source of quail feces, the price of feed will be lower with feed price made from other raw materials^[13]. (3) Cassava is a priority raw material in this study, because it is easy to obtain has never been used as a feed raw material. In addition to raw materials, cassava also serves as a glue^[8]. Cassava used is a smoothing of cassava that has been boiled. The purpose of boiling is to cause sap and eliminate toxins HCN contained by cassava. In the list of foodstuff analysis issued by the Directorate of Nutrition of Dep.Kes, it is stated that the nutritional cassava is: protein 1.2%, fat 0.3%, carbohydrate 34.7%, water 63% (Rinoto, 2014). (4) fine bran is a by-product of rice milling. The selected bran has a fine texture (grain), not moist, no foul smell, and has a fresh color. Bran contains nutrients: 11.35% protein, 12.15% fat, 28.62% carbohydrate, 10.5% ash, crude fiber 24.46% and water 10.15%^[12].

Economically cultivation of catfish conducted by farmer groups is quite successful, they can generate profits for 10,000 seedlings in the 2-3 month period of approximately Rp 5,000,000, if the average farmer group earnings per day RP . 66,000, -, Their income can increase if feed price is cheaper. The feed price used by the farmer group is around Rp 10,000, -, / kg, if the farmer can get the feed for around Rp 5,000, - / kg, each member of the farmer group will earn Rp.93.000, -, per day . One effort that can be done to reduce the price of feed is the farmers of catfish farmers should gather their own feed. The price of homemade food can be made Rp.5.000, -, / kg with good quality.

The right family member is empowered to improve the family economy through the cultivation of catfish is the farmer's wife. Farmers' wives in Limau Gadang Nagari tend not to improve the family economy, they play a role in taking care of the children, doing housework and sometimes delivering food to the fields and to the fields. Farmer's wife is economically unproductive improving the family economy. Generally their activities only stay at home and only help cultivate the land at a certain time. The role of the wife can be utilized to improve the family economy. Economic activity that can be done by farmer's wife is catfish farming. Catfish farming is not complicated and can be done by the farmer's wife while taking care of the household, generally the farmers have a decent land to be used as a catfish pond^[2]. Cultivation of catfish is enough to give profit. The fish farmers gain enough profit. The benefits of cultivation can still be improved if farmers can make their own feed.

Fortunately earned will reach 40-50% If using factory feed gain is only 20-25%. Making your own fish feed does not require large fund. Price per kg can be reduced to 50%. Raw materials used are raw materials

that exist around Limau Gadang, eg trash fish, quail feces, fine bran and cassava. The problems faced by farmer's wife in catfish farming is the difficulty of getting fish seeds and making feed.

Specific objectives to be achieved in this research is for the farmer's wife can contribute to improve the family economy. Urgency of this study, if the family economy increases, then TNKS avoid the pressure of the population. Innovative findings found in the study are the right nutritional formulations to grow catfish and the skills to make their own quality feed.

Research Method

Poor farmer's wife as 20 people are grouped into four groups and designated as catfish farmers. They are educated and directly involved in research. Research activities: (1) making fish feed with raw materials trash fish, quail feces, fine bran and cassava. All raw materials except cassava are dried and mashed. The cassava is boiled, then all the ingredients are put together into dough and printed using printing equipment. Wet pellet are dried in the sun; (2). to conduct guidance evaluation and guidance to group of farmers. If it has not succeeded, the coaching will continue until it is complete. Performed to formulate the nutrient content of pellets and laboratory test.

In this activity look for the right formulation to get protein, carbohydrate, and fat levels. By considering the nutrient content of raw materials. To obtain the protein content of 22.92% (minimum requirement of catfish protein by 20%) in one kilogram pellet, it takes 30% trash fish, 45% quail feces, 15% fine bran, 10% cassava, with the provision of trash fish protein 40%, 20% quail stool, 12% fine bran and 1.2% cassava.

Variations of nutritional formula are made of 4 kinds:

- 0% trash fish: 45% quail stool: 15% fine bran: 10% cassava
- 35% trash fish: 40% quail stool: 15% finely ground: 10% cassava
- 40% trash fish: 35% quail feces: 15% finely ground bran: 10% cassava
- 45% trash fish: 30% quail feces: 15% finely bran: 10% cassava

From 4 variations, the best variation will compared to factory-made feed. The main requirements of artificial pellets should contain high nutrition, easy to process and do not contain toxic, easy to obtain, and affordable prices. How to make the feed (pellet):

- 1) taken trash fish, quail feces, fine bran, cassava mixed into one and stir evenly, then added with tempe yeast as much as 125 grams. stirred;
- 2) paste closed, let stand one night for fermentation process well;
- 3) fermented paste that has been settled one night mixed with salted fish and papaya leaves that have been ground first, then stir evenly;
- 4) put up a pellet printer, and put the paste in. The resulting pellets are cut to 1.5 cm. Pellet is then dried in the sun to dry. Catfish cultivation research by farmer's wife to increase family income in Nagari Limau Gadang Subdistrict IV Jurai, stage 1 has succeeded in developing farmer's wife and make pellet. The study will continue in year II. In year II will be known the quality of standard pellets made by the farmer's wife.

Research activities that have been done are: 1) formulate the nutrient content of fish feed; 2)making formulated feed; 3) test the effect of homemade feed on catfish growth; 4) choose the best formula that will be compared to the factory-made feed; 5)test the best quality pellets in the lab.

Results and Discussion

In this research produced various pellet formulas, the level of cultivation and skills of farmers' wives make pellets. The percentage of farmers 'wives who understand and do not understand how to make pellets before they are educated can be seen in table 1.

No	Activity	No. of Wife Farmers	Not Understood	% Do not Understood	Understood %	Understood
1	Make Pellet	20	20	100%	0	0%

Table 1: Percentage of farmers' wives who understand and do not understand in making pellets before they are educated.

Listening to the low percentage of wives of farmers in making feed. This is in accordance with the assertion of Armen [1] that the women of Nagari Limau Gadang, especially the farmer's wife, only help the

husband work to earn a living in the fields and no other activities. Their work only helps the husband to cultivate the fields in TNKS and cultivate the rice fields. Percentage of farmers' wives who understand and do not make pellets after being educated can be seen in table 2.

No	Activity	Number of Farmers Wife	Not Understood	% Do not Understood	Understood	% Understood
1	Making Pellet	20	3	15%	17	85%

Table 2: Percentage of wives who understand and do not understand in making pellets after being educated.

To produce feed catfish, required raw materials containing nutrients. The necessary nutrients are proteins, fats, carbohydrates and minerals. The raw materials made into pellets are trash fish, quail stools, fine

bran and cassava. The result of pellet formulation made from raw material is 4 variation. The percentage of raw material required to make a quality pellet can be listened to in table 3.

No	Percentage of raw materials for quality pellets			
	Trash fish	Quail feses	Finely bran	Cassava
1.	30%	45%	15%	10%
2.	35%	40%	15%	10%
3.	40%	35%	15%	10%
4.	45%	30%	15%	10%

Table 3: Percentage of raw materials for quality pellets

To make a quality pellet more precedence protein and carbohydrate nutritional content. Trash fish contains 43%-50% protein, quail feces contains 18%-20% protein and 11%-15% carbohydrate, cassava contains 1.2% protein and 34,7% carbohydrate. Fine bran contains 11,35% protein and 28,62% carbohydrate.

Pellets made from 30% trash fish, 45% quail feces, 15% fine bran and 10% cassava obtained pellet containing 22,82% protein and 17% carbohy-

drate. This pellet is suitable for enlarging catfish. Good pellet protein content for 20-30% catfish and 15-20% carbohydrate [14].

Based on laboratory test Pellet with good nutrition for catfish enlargement is pellet made from 40% trash fish, quail feces 35%, 15% fine bran and 10% cassava. The results of laboratory tests showed the quality of homemade pellets is standard for catfish feed because protein needed for growth of catfish around 20-23% [7]. The results of homemade pellet laboratory tests can be seen in Table. 4

Result of analysisist			
No.Sampel	Carbohydrates (%)	Fat (%)	Protein (%)
1	38.39	2.20	22.08
2	26.55	2.09	34.60
3	39.56	2.32	21.79
4	31.40	1.95	28.03

Table 4: Results of fish feed analysis.

Conclusions

Based on the results of the study, it was concluded that:

1. The farmer's wife does not yet have the skills or knowledge to make catfish feed.
2. The wife of the farmer is able and skillful to make a quality catfish feed.
3. Raw materials trash fish, quail feces, fine bran and cassava can be made into high quality catfish feed.

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