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Tilapia Cultivation Using Concrete Pond

(Case Study: Desa Tanggulun, Garut, Jawa Barat)

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***Abstract*—In line with the population increase, the need for food in Indonesia is also increase. Fishery is one of the important sectors that can support food security and the Indonesian economy. Fishery is considered to have a more stable economic value than agriculture. Freshwater fish cultivation can be developed as an effort to advance the village economy. This study aims to identify the level of community knowledge about good fish cultivation and provide assistance in the implementation of fast-water pond for the development of tilapia cultivation. Assistance to the community is carried out through direct counseling by inviting speakers from related ministry. Identification of community knowledge was carried out by providing a questionnaire during mentoring, while the fast-water pond was made based on an ideal design for tilapia cultivation and the geographical conditions of the village. Freshwater fish, especially tilapia, are expected to be the superior product of Tanggulun Village, so it can encourage the economic progress of the village and the community.**

Keywords—fishery, tilapia cultivation, fast-water pond

I. INTRODUCTION

Indonesia has several types of fisheries regions, namely, ocean, rivers, lakes, reservoirs, swamps, and other puddles in the territory of the Republic of Indonesia. According to Law Number 31 of 2004 Fisheries states that fish cultivation is an activity to maintain, raise and breed fish and harvest the results in a controlled environment, including activities that use ships to load, transport, store, cold, handle, process, and preserve it. The increasing demand for fish certainly has a positive meaning for fisheries development, especially for an archipelagic country like Indonesia which has a large enough potential and potential for fisheries development, both catching and aquaculture [1]. Fish Cultivation has a high potential to improve the welfare of the community [2]. Tilapia is one of the fisheries commodities favored by the people and can be cultivated on unproductive land [3].

Fisheries have not become the main topic in regional development priorities in the RPJMD (Rencana Pembangunan Jangka Menengah Daerah) of Garut Regency for 2019 – 2024. Basically, the fishery sector can support increasing economic value added through the development of freshwater fish farming. In addition, fisheries can increase food security and the potential of the fisheries sector is also increasing along with the development of the hospitality business (hotels, restaurants, catering). Tanggulun Village, located in Garut Regency, West Java, is an area located at an altitude between 500-700 meters above sea level with a temperature between 17-28 C. Based on its hydrology, the flow of rivers in the Tanggulun village area forms a watershed pattern. Watershed is an ecosystem unit where organisms and their environment interact dynamically and there are interdependencies between their components. Based on these conditions, Tanggulun Village has prospects in the utilization of water resources. Currently, water resources such as rivers are only used as a source of drinking water and irrigation of rice fields. Previously, villagers had tried to cultivate fish, but it didn't go well. This is due to limited knowledge and abilities, marked by the pond construction that are not in accordance with standards, poor breeding, and the operation of feeding, harvesting, and post-harvesting has not been carried out properly. These things make the fish farming business less profitable and is considered difficult by the villagers [4-7].

Lack of knowledge about good fish farming methods is the main cause of failure in fish farming in the Tanggulun village. In addition, the absence of support from village officials also makes the Tanggulun Village community have limited knowledge and abilities related to good fish farming. This study aims to identify and increase public knowledge about good fish farming practices and to develop tilapia cultivation using swift water ponds. Freshwater fish farming especially tilapia cultivation is expected to become the superior product of Tanggulun Village so it can improve the economy of the society and village.

II. METHODOLOGY

This research was conducted in March 2021 in the Tanggulun Village area, Kadung Ora District, Garut Regency, West Java. This research is divided into two main parts as seen in Figure 1: (1) counseling and identifying community knowledge about fish farming and (2) developing rush water ponds for fish farming. The research process was carried out by

literature study, field survey, open interview with village apparatus, and questionnaires.

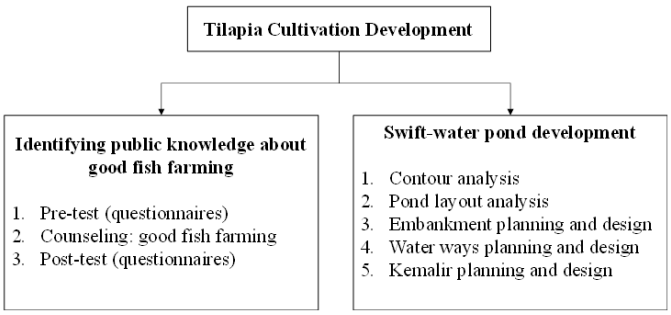

Fig. 1. Research methodology.

First part of this study is counseling and identifying community knowledge about fish farming. Counseling is carried out by involving related agencies, Department of Marine and Fisheries of West Java Province and fishery practitioner from Sukabumi. Questionnaires were given to the community before (pretest) and after (post-test) counseling activities. Pretest and posttest conducted to determine the level of community knowledge and identify the effect of the counseling that had been carried out. In addition to counseling, community assistance is also carried out in developing swift-water ponds for fish farming community groups in Tanggulun village.

Second part of this study is swift-water pond development. The pond development process begins with analyzing the contours of the land and the layout of the fishpond, followed by determining the type of fishpond embankment, waterways, and kemalir. The swift-water pond was developed according to the characteristics of tilapia cultivation by considering the geographical conditions of Tanggulun Village.

III. Results and Discussion

Tanggulun village has an area of 248 ha consisting of 128 ha of rice fields and 120 ha of land. Most of the land in Tanggulun Village is used productively as agricultural land, this shows that Tanggulun Village has sufficient natural resources. As for human resources, according to population data in 2015 there were 12,382 people with 1,559 family heads spread over 19 villages in 3 Kapunduhan areas, 9 RW and 26 RT. The livelihoods of the Tanggulun Village community consist of 65.95% farmers, 22.36% traders/entrepreneurs, 5.29% civil/private employees, 3.62% ABR and 2.78% are retirees.

The counseling about good fish farming was attended by 50 villagers, most of whom were part of the fish farming community group. Counseling was given by two main speakers; Head of Fish Cultivation, Processing and Marketing of Fishery Products from the Department of Marine and Fisheries of West Java Province, and the second speaker is fish farming practices originating from Sukabumi. In addition to delivering material on good fish farming, in this counseling a pretest and posttest were also carried out. This test was conducted to identifying the public knowledge about good fish farming before and after counseling activity. Figure 2 shows the result of pre-test and post - test, it shows there is a knowledge improvement after counseling. It shown from the average score of the pre-test is 3.38 and the post-test is 3.48.

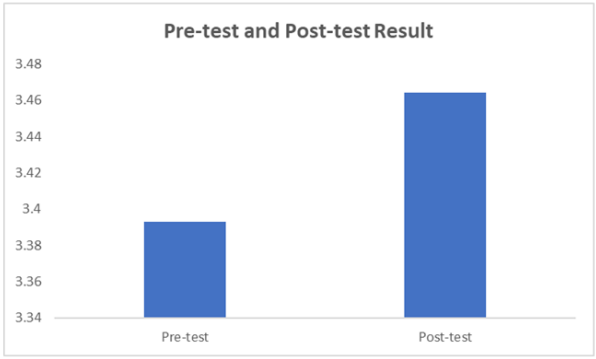

Fig. 2. Pre-test and post-test result.

The next process is to develop a pond for fish farming. Before determining the type of pond to be developed, first determine the type of fish to be cultivated. Based on the geographical conditions of Tanggulun village which is included in the highlands with a cool climate, it was determined that the suitable freshwater product was tilapia. Therefore, it was decided to develop a type of swift-water pond. The process of developing a swift-water pond consists of: (1) Analyzing the contours of the land, the pond will be built on flat land so that the excavation of the pond needs to be carried out on all sides. (2) Analyzing the layout of fish ponds, fish ponds will be made with a parallel irrigation system where each pond will get water intake from the flow of water sources directly so that water quality can be maintained and not polluted; (3) Make a fish pond embankment, the embankment serves to hold water and as a barrier to the fish pond, the embankment will be made using walls to be watertight (not seeping), strong to withstand water loads, not easy to erosion, and not leaking; (4) Making waterways, There are two types of waterways to be made, inlet and outlet waterways. The distance between the water inlet and the outlet must be made as far as possible and crossed so that the incoming water will not flow out directly but will replace the old water first. The water inlet is made of PVC pipe, laid across and through the embankment. The height of the pipe is higher than the water level of the horizontal pool and is fitted with a net so that no animals can enter and leave the pool. There are two types of outlets, namely the circulation water outlet and the exhaust channel. Circulating water channels are made on the surface of the pond and a drainpipe for harvesting water is made at the bottom of the pond (figure 3). Pipes made on the surface, installed crosswise on the embankment. The part facing the pool is lower than the part outside the pool. While the sewer is made at the bottom of the lowest pool. Usually made in the kemalir channel. At the end of the pipe in the pool is fitted with a valve that can be opened and closed; (5) Making kemalir, kemalir channel is a ditch at the bottom of the pond, the depth is about 20-30 cm. Kemalir serves to assist harvesting, accommodate food residue deposits, precipitate harmful mud, and regulate bottom water flow. The amount of kemalir is adjusted to the water outlet.

Fig. 3. Pond making process.

IV. Conclusion

The level of public knowledge about good fish farming methods owned by the Tanggulun Village community is still relatively low. This can be seen from the results of observations and pre-test that have been carried out before counseling. So, it can be said that all this time that caused the failure of fish farming in Tanggulun Village is lack of knowledge about good fish farming. After all of activities include counseling and pond development were carried out, the public knowledge is getting better, and people become more enthusiastic about carrying out fish farming in the future. Tilapia aquaculture is expected to become the superior product of Tanggulun Village so that it can encourage the economic progress of the community and village.

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