

# Small Fisherman Participation Through Fish Pond Business Development

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## ABSTRACT

Fishermen on the north coast of Semarang City are a vulnerable community group. This is because the level of education and the economy is low, so efforts are needed to empower them. Tilapia cultivation is one of the efforts to develop the economy and empower small fishing communities in Tambak Rejo. This research aims to find out and to analyze Fishermen's Participation through Tilapia Fish Farming Business so that the welfare of life increases. This research uses descriptive qualitative research methods. In addition, Participatory Action Research (PAR) is also used to conduct research that is simultaneously coupled with real action in the community. The results of this study are 1) Most of the people of Tambak Rejo Semarang are included in the lower middle class category, so there needs to be empowerment efforts for the Tambak Rejo fishing community in order to improve their quality of life; 2) Tilapia fish farming is an alternative model for empowering small fishermen which aims to provide skills and encourage the spirit of entrepreneurship. 3) The problem faced by Tambak Rejo fishermen is the lack of community participation from fishing groups in the planning stage, resulting in the inhibition of the implementation of the program. In addition, technical constraints both internally and externally; 4) The strategy for empowering small fishermen in Tambak Rejo is carried out by facilitating the growth of awareness and participation of the small fishermen community, encouraging their independence, and developing collaborative plans with various parties.

**Keywords:** *Community Participation, Fishermen, Fish Cultivation*

## 1. INTRODUCTION

Indonesia is one of the archipelagic countries that has a long coastline, this makes many people who depend on the fisheries and marine sector. Fishery products can meet food needs, especially animal protein needs. Animal protein in fish is needed for the growth of children, helps educate the brain and for the elderly is not at too high a risk of fat content compared to other protein sources. <sup>1</sup>. Fisheries can be used as a means of absorbing labor and being able to contribute to the national and regional economy. Fishery development is not only a business process to increase fishery production, but also includes income, increasing the standard of living of fishermen and fish cultivators <sup>2</sup>. However, many of them live in conditions of poverty, backwardness and slum settlements. Therefore, their

condition needs to be considered so that they can live a decent and quality life.

The living conditions of small fishermen who live in Tambak Rejo are still not categorized as prosperous. Even though they have occupied the government-assisted row houses, their income from marine products is uncertain and can only be used to finance their daily basic needs. In addition, the poverty experienced by the people in Tambak Rejo is also influenced by the low quality of human resources, the lack of ownership of business capital and technology as well as the lifestyle of the community <sup>3,4</sup>. The condition of the village which is chaotic, disorganized and affected by coastal abrasion has become a concern for the Government to revitalize the village in Tambak Rejo. This is the impact of the development of coastal areas that are transformed into

residential areas, so that this fishing village is not well organized. Therefore, efforts are needed to reorganize the Tambak Rejo village and make it a sustainable residence. To realize this, the social capital of the community needs to be integrated in efforts to develop and organize the Tambak Lorok Area. <sup>5,6</sup>.

The position of small fishermen who are squeezed in the fishing and marine business has made some of them work part-time in informal aspects on land, such as being employees and coolies at Tanjung Mas Port, hair cutting business, selling at the port (especially for the wives of small fishermen), and other informal sectors. By working outside the fisheries sector, small fishermen get additional income to meet their household needs <sup>7</sup>. However, the income is only sufficient to meet their daily needs, while their monthly and annual needs must be obtained from other sources that are uncertain. Sometimes they even have to borrow from banks, credit institutions, and their relatives. In addition, by working outside the fisheries and marine sector, they do not get much access to jobs because their education and skills levels have not been met <sup>8</sup>.

Various efforts have been made by the government and the private sector in order to improve the quality of life of small fishermen. Starting from the development of livelihoods to improving facilities and infrastructure in the fishing environment to community empowerment. Empowerment of fishing communities is a program that has been launched long ago. In this program, the social capital owned by fishermen becomes the basis for the development and implementation of empowerment <sup>9,10</sup>. For example, in West Java, fishing communities are empowered through the development of capture fisheries. In this case, activities are focused on small fishermen with the aim of increasing the knowledge and skills of fishermen. The empowerment program is carried out with training and mentoring methods so that through this program the skills and welfare of fishermen are expected to increase <sup>11</sup>. In addition, fishermen empowerment programs are also carried out in other ways, namely catfish farming. This empowerment program is carried out in two steps, namely a technical and participatory approach <sup>12</sup>. With this approach, small fishermen can further increase their knowledge of catfish farming so that it can be an alternative choice when they do not go to the sea.

Based on the above conditions, an effort is needed so that the fishing community in the city of Semarang can have a prosperous and economically empowered life. One of the efforts that can be done is to develop fishermen's livelihoods based on the potential and skills they have, namely the brackish water fish farming business. The selection of brackish water fish species is also based on market demand and the high economic value of these fish species. This is also a model for developing small businesses for fishing communities in urban areas.

## 2. RESEARCH METHOD

This study uses qualitative research methods as the basis for research, and is supported by Participation Action Research (PAR).<sup>13</sup>. Qualitative research is used because this research produces descriptive data in the form of written or spoken words from people and observed behavior. Participation Action Research (PAR) is used to map out problems and potentials possessed by coastal communities and small fishing groups. In addition, PAR will also be used to map the empowerment steps for small fishermen in Tambak Rejo. This research will be located in Tambak Rejo, Tanah Mas District, Semarang City. The informants of this research are the people of Tambak Lorok, especially small fishing groups.

The data collection techniques are carried out in several ways as follows. First, in-depth interviews, both structured and unstructured. Tools in the form of question guides, questionnaires, and recording devices will be used. Informants in this study were obtained by purposive sampling method. Meanwhile, the supporting informants are community leaders, village officials, local NGOs, the Semarang City Community Empowerment Agency, and related agencies within the Semarang City Government. Based on the research activities in the field, the informants in this study included: Mr. Abdullah Marzuki, Mr. Jupriadi, Mr. Dani Pujito, Mr. Achmad Aksis and Mr. Rohmadi.

Second, focus group discussions (FGDs) where researchers hold focus group discussions in this case the targets are local governments, local NGOs, the general public and small fishing groups in Tambak Lorok. The FGDs were conducted to dig up information related to the problems faced. Third, document analysis in the form of reviewing good documents, journal articles on related topics as well as research documents, such as village stories, urban monographs, work plans and annual reports from related offices. Fourth, observations were made to observe directly the physical and social environment, including the activities of small fishermen. The FGD activity in this research took place on August 22, 2021 and was attended by Dr. Moh. Sholehatal Mustofa, M.A, along with Mr Faiq as an experts in the management of brackish water fish and of course most of the residents of Tambakrejo, Semarang..

## 3. DISCUSSION

### *3.1 The Socio-Economic Reality of Small Fishing Communities in Fishing Communities through Tilapia Cultivation*

The socio-economic reality of the Tambak Rejo fishing community is a community in a marginalized, transitional condition and vulnerable to economic conditions. Most of the people of Tambak Rejo Semarang are included in the lower middle class

category so that it is very necessary to empower the small fishing community of Tambak Rejo in order to improve their quality of life; On the other hand, the fishing community of Kampung Tambak Rejo, Semarang City has a good relationship between individuals with one another. Here the interaction between communities is established quite well. This is evidenced by the existence of several community activities that must be carried out together and these activities are still running well, for example routine recitations, routine studies, community service, and so on. The condition of the Tambak Rejo community is as shown in the image below:



**Picture 1.** The Socio-Economic Conditions of the Residents of Tambak Rejo. Source: Processing of primary data sources September 19, 2021

The people of Kampung Tambak Rejo seem to have a bond to help each other and work together when there is something to be done. Armed with the spirit of togetherness owned by the people of Kampung Tambak Rejo and a strong sense of solidarity, it can be a reinforcement in implementing tilapia cultivation programs in coastal areas. In terms of empowerment, community participation is the main thing that must exist in a society. Here the people of Kampung Tambak Rejo are very ready when asked to participate in the empowerment program through the cultivation of tilapia. Even the community members voluntarily offered to provide assistance to make the community empowerment program a success through tilapia cultivation.

On the other hand, the economic condition of the people of Tambak Rejo is a community whose main livelihood is fishermen. Here people only rely on marine catches to meet their daily needs. The fishing community of Tambak Rejo Village, Semarang City initially had ponds, such as shrimp, crab, milkfish ponds, and others that could provide income to the community apart from fishing. However, these ponds no longer exist because the government has evicted them to neutralize the flooded area of the east canal. Since being evicted, the community admits that it is difficult to earn income because they no longer have a pond and only rely on uncertain sea catches. In addition, since the

eviction, the fishing community has become difficult to go to sea because they have to have a boat. Therefore, a program is needed to empower fishing communities by cultivating tilapia in tarpaulin ponds. The purpose of this research is to raise the spirit of the community so that they have the motivation to start an empowerment business through tilapia cultivation. The hope is that through tilapia cultivation, it can help the community to improve the economy.

### ***3.1. Tilapia Pond Business is one of the Alternative Empowerment Models for Small Fishermen in Rejo Pond Semarang***

The condition of the Tambak Rejo community is very vulnerable in economic conditions, so this condition encourages the need for an assessment of the socio-economic conditions of the people there. Based on the condition of the Tambak Rejo community in the field, the cultivation of this Tilapia fish pond can be one of the Alternative Empowerment Models for Small Fishermen of Tambak Rejo Semarang. In particular, the farmers/fishermen in the preparation of the development program for the development of brackish water fish cultivation are actively intended so that the development program is an activity that has a very broad impact on the lives of the people who are the target of the program. This community involvement becomes a very important capital so that the strategy in making fish ponds can be realized properly. Community involvement in this matter starts from the selection of Tilapia fish farming locations; Pond Creation and Preparation; Seed Selection; Stocking of Tilapia Seeds; Tilapia Fish Feeding; to Tilapia Care.

### ***3.2. Selection of Tilapia fish farming location***

Location is a very important thing and must be considered when you want to start a cultivation, here the location determination is very influential on the sustainability of cultivation, especially Tilapia fish cultivation. The location for tilapia cultivation must be strategic, where the location of the pond can be easily reached, has flat land, is close to water sources, there are supporting facilities such as communication facilities, electricity networks, and so on. Then, things that need to be considered in determining the location of Tilapia cultivation are that the land used does not damage the existing environment and the security of the location is guaranteed or not disturbed by irresponsible people. Here the MBKM TEAM Builds a Village together with three fishing groups in Tambak Rejo Village in determining the location of Tilapia fish cultivation, paying close attention to all aspects that determine the preparation of Tilapia fish farming locations. In this case, the fishermen group of Kampung Tambak Rejo gave three recommendations for the location of Tilapia fish cultivation, including the following: Empty land in front of the entrance gate to Kampung Tambak Rejo RT 06/RW 16; The square in front of the Al-Firdaus prayer

room in Tambak Rejo Village; Next to the Green House: The last location recommended by the fishing group and the preferred location for tilapia cultivation is next to the green house.



**Picture 2.** Activities for Making Brackish Water Fish Cultivation Ponds. Source: Processing of primary data sources September 19, 2021.

The location of the fish pond is close to the road and in the middle of the settlement so that the security, facilities, and infrastructure needed to support Tilapia cultivation have been met. In addition, at that location the soil structure is also flat so it doesn't take long to prepare a place for the Tilapia fish pond.

**3.2.1. Pond Creation and Preparation**

The construction of the Tilapia fish pond begins when the location of the pond for Tilapia cultivation has been determined, here the MBKM Team Building a Village and the fishermen's group chose a location next to the Green House for Tilapia cultivation. Tilapia fish pond was made using tarpaulin and bamboo with a size of 2 m x 1 m with a height of 50 cm and a size of 1 m x 50 cm with a height of 50 cm. Here we ordered ready-made tarpaulins for 6 pools consisting of 3 large pools and 3 small pools. After that, together with a group of fishermen, we made a pond frame from bamboo and made a roof from bamboo which was given a paranet to reduce heat with a size of 3m x 6m and a roof height of 2m.



**Picture 3.** Activities for Making Brackish Water Fish Cultivation Ponds. Source: Processing of primary data sources September 19, 2021

After finishing making the pool, the thing that needs to be done is to prepare the tarpaulin pool so that the pool is ready for use. Here the preparation of the pond

for cultivation is done by soaking the tarpaulin pond with water for three days and three nights and given non-iodized salt, banana midrib, and papaya leaves with the aim of removing chemicals from the tarpaulin because the tarpaulin is not neutralized will endanger the sustainability of the pond. Tilapia live. After soaking for three days and three nights, then the water, banana midrib, and papaya leaves are removed and then the pool is filled again with PDAM water.



**Picture 4.** Activities for Making Brackish Water Fish Cultivation Ponds. Source: Processing of primary data sources September 19, 2021.

After neutralizing the tarpaulin pond, the next activity is to neutralize the pond water because the water used for Tilapia cultivation in Tambak Rejo Village uses PDAM water, because PDAM water contains chlorine which can injure Tilapia. Therefore, PDAM water for ponds must be neutralized first. The way that can be done to neutralize PDAM water is to let the water sit for three days and three nights. In addition, the water is given charcoal and salt that is not iodized. After three days and three nights, the charcoal can be taken back and the water and the tarpaulin pond are ready to be used for fish farming.

**3.2.2. Seed Selection**

Seed selection is an important factor that determines the success rate of Tilapia cultivation. For maximum results, you should choose male fish seeds because the growth of male Tilapia is 40% faster than female Tilapia.



**Picture 5.** Selection of Brackish Water Fish Seeds. Source: Processing of primary data sources September 22, 2021.

Tilapia cultivation in mono sex is more productive than mixed because Tilapia has the nature of easily spawning so that if the cultivation is carried out in a mixture, the fish energy will be used up for spawning and the growth of fish weight is slightly inhibited.

### **3.2.3. Stocking of Tilapia Seeds**

Tilapia seed dispersal can be done when the pond and pond water are completely ready to be used for cultivation, where the tarpaulin pond and water to be used for cultivation must be completely neutral so as not to endanger the survival of Tilapia. The right time to sow tilapia seeds is in the morning or evening when the sun is not so hot and stinging. Seed dispersal activities can be seen in the following picture:



**Picture 6.** Distribution of Brackishwater Fish Seeds. Source: Processing of primary data sources September 22, 2021

The way that can be done to spread Tilapia seeds is to put Tilapia seeds which are still wrapped in plastic into the pond and let stand for 15 minutes with the aim that Tilapia seeds can adjust the temperature with the new pond water. After 15 minutes, the plastic wrapper for the seeds can be opened and put a little pond water into the plastic so that the Tilapia fish can adapt to the pond water. After that, let the Tilapia seeds come out by themselves from the plastic. Finally, make sure all the Tilapia fish are out of the plastic and are in the pond.

Here it is also necessary to ensure that the aerator must function properly so that the fish get enough oxygen.

### **3.2.4. Feeding Tilapia**

Tilapia feeding can be done after two days the fish seeds are sown. So when the fish seeds are sown, the seeds should not be fed immediately, but have to wait for two days so that the fish seeds can adapt to the new environment and eat the microorganisms in the pond. Here choose quality feed and contain complete nutrition. The size of the feed can be adjusted according to the age of the Tilapia. Tilapia feeding can be done at any time, but the best time for feeding fish is in the morning and evening so that the growth of Tilapia is more rapid and maximal. In addition to tilapia feed, it is also necessary to provide vitamins for fish so that the growth of tilapia can be maximized and the fish meat becomes more delicious and savory. For the provision of vitamins, Tilapia can be adjusted according to needs.

### **3.2.5. Tilapia Care**

Carrying out care and maintenance in tilapia cultivation in tarpaulin ponds is a must. Without fish care and maintenance, the risk of tilapia mortality is very high. Here extra care for Tilapia must continue to be given, especially when the season changes or during extreme weather. By taking extra care, Tilapia will avoid pests or diseases that can cause death. Steps that can be taken so that Tilapia cultivation can be successful is to separate Tilapia which has fast growth and Tilapia which grows slower. In addition to preventing cannibalism, the separation can make Tilapia harvest more evenly. In addition, things that need to be considered in treating Tilapia are ensuring that the provision of Tilapia fish feed is sufficient and in accordance with the needs of the fish. In addition, the cleanliness of the pool also needs to be maintained, here it is necessary to change the water regularly so that the pool water remains clean and not cloudy. Then when the harvest season arrives, the thing that needs to be done is to determine the method of harvesting, namely harvesting partly or all at once. If you choose to harvest all at once, then Tilapia can be harvested using nets. Here the thing to note is to avoid using fishing gear that is too big or rough because using rough fishing gear can injure the fish's body.

## **4. Problems faced by the Small Fisherman Community of Tambak Rejo Semarang in Tilapia Cultivation**

The people of Tambak Rejo in the implementation of the management of Tilapia aquaculture do not just run smoothly, but also in the field there are several obstacles and problems encountered. Before the fish pond cultivation activity was created, the research team conducted a FGD (forum group discussion) with a group of fishermen in Tambak Rejo which was held on

August 15, 2021 at the Al Firdaus Mosque. The FGD was carried out with the aim of determining the priority scale of brackish water fish cultivation to be carried out with a group of fishermen in Tambakrejo. The result of determining the priority scale raises the problems and expectations of the fishermen. Each group of fishermen has almost the same problems and expectations. The following is one form of FGD activity that has been taking place:



**Picture 7.** Brackishwater Fish Cultivation Socialization Activities for Tambakrejo Residents. Source: Processing of primary data sources in the field, August 22, 2021.

The problems faced by fishermen include the following: 1) Prior to the eviction, it was very easy for fishermen to earn a living, 2) Before the eviction, the fishermen owned ponds such as crab ponds, eel and lobster ponds, 3) The fishermen did not have the capital to do fish farming. 4) The cost of daily living tends to be more expensive, 5) Fishermen can only rely on uncertain catches from the sea. From this problem, the same hope emerged from all fishing groups in Tambakrejo. The expectations of the entire Tambakrejo fisherman group include: the hope of all fishermen groups wanting to cultivate fish such as tilapia, but the fishermen are constrained by the cost of cultivating fish, they do not have the capital for fish cultivation. The fishermen hope for assistance for Tilapia fish cultivation.

So that when fishermen cannot go to sea, fishermen can earn income through fish cultivation. In addition to capital and financial assistance, the fishermen expect scientific guidance related to fish cultivation, because the majority of fishermen do not know or have no knowledge related to fish cultivation. So by holding fish farming in Tambakrejo, the community's economy can return to what it used to be. From the results of the FGD to make a fish pond, some preparations are needed such as a place and some other equipment. Determination of the location of fish farming ponds at the north end or south end of the Tambakrejo fishing village. While the preparation of the main tools needed are tarpaulins, nails, iron, peralon, bamboo and so on.

The management of tilapia aquaculture ponds is a community empowerment program that aims to provide skills, encourage the spirit of entrepreneurship, especially for people who work as fishermen in Tambak Rejo Village. In practice, community participation is the main factor that determines the success and failure of a program. The lack of community participation from fishermen's groups in the planning stage has hampered program implementation. In addition, technical constraints related to fish pond maintenance originating from internal factors such as water quality, feeding schedule and post-harvest management affect fish breeding. On the other hand, external factors such as extreme weather and pests and diseases are still the main challenges that can cause fish deaths. Therefore, in the process of managing tilapia, good and correct techniques are needed in its care and cooperation from various parties for the success of the program.

#### ***4.1. Strategy for Empowering the Small Fisherman Community of Tambak Rejo through Tilapia Cultivation***

##### ***4.1.1. Facilitating the Growing Awareness and Participation of Small Fisherman Communities***

Empowerment of small fishermen in Tambak Rejo will not succeed if they do not have the self-awareness to move forward and develop. To foster this self-awareness, small fishermen in Tambak Rejo are invited to jointly identify their potential and problems. Through a series of focus group discussions (FGD), and sharing with residents, they can find out the problems they face and ways they can do to overcome these problems. The main problems they face today are economic, social and environmental vulnerabilities. This is because they do not have permanent settlements, limited fishing gear, conflicts and competition between groups of fishermen that often occur, as well as fears of coastal abrasion that they once felt.

In addition to identifying problems, the Tambak Rejo fishing community is also invited to recognize their potential. This potential will be the basis for tackling economic, social and environmental problems. As people who were affected by the eviction of their settlements 2 (two) years ago, they have the same feeling of fate and hope. This is the main potential in the community empowerment process in Tambak Rejo, because all the limitations they have can be overcome together. As with limited fishing gear, they use it in turns so that all small fishermen can carry out their fishing activities. In addition, some of the problems and social conflicts that have occurred, they can also resolve through deliberation and kinship. This collectivity and solidarity become the main potential in empowering small fishing communities in Tambak Rejo through

tilapia cultivation. With the emergence of this awareness, small fishermen in Tambak Rejo and actively participate in all processes of community empowerment activities.

#### **4.1.2. Encouraging the independence of Small Fishermen in Managing Fish Ponds**

One of the challenges in the community empowerment program is the realization of the independence of the target community. Without independence, the program to be implemented will not be sustainable. In Tambak Rejo, efforts to encourage the independence of the fishing community in this empowerment program have encountered several problems, including the attitude and mentality of the people who always expect help from outsiders. This attitude is quite influential on some of their activities and several programs that enter their area. However, this attitude began to diminish a little when they followed all the processes in this tilapia cultivation program. This is because the steps taken do not start with providing fish pond assistance first, but start from a long discussion process so that they can identify their potential and problems. With this process, they can actively plan, conduct and monitor their own tilapia cultivation through fish ponds.

This independence can also be seen in their enthusiasm for doing new things. During this time, they obtained fish by catching it in the sea, but now they are learning to cultivate fish on land. A process that is not easy and they have to adapt, but with the learning by doing model, they can do it independently.

#### **4.1.3. Develop a Collaborative Plan with Various Parties**

The development of aquaculture (sea and land) is based on cooperation between technical agencies related to community organizations, community groups and farmers/fishermen. Institutional cooperation in the development of aquaculture is related to access to capital and marketing support. Several parties that can be invited to collaborate in the development of brackish water fish farming are: the local government, the Department of Marine Affairs and Fisheries, the Department of Agriculture, social activists and academics.

## **5. CONCLUSION**

The socio-economic reality of the Tambak Rejo fishing community is a community in a marginalized, transitional condition and vulnerable to economic conditions. Most of the people of Tambak Rejo Semarang are included in the lower middle class category so that it is very necessary to empower the

small fishing community of Tambak Rejo in order to improve their quality of life.

Tilapia fish pond business is one of the alternative models of empowerment for small fishermen in Tambak Rejo Semarang. This Tilapia fish pond business aims to provide skills, encourage the spirit of entrepreneurship, especially for people who work as fishermen in Tambak Rejo Village. Awareness, participation, learning by doing, and collaborative programs are their efforts so that tilapia cultivation can be sustainable.

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