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Article

Improving Waduk Jatiluhur's fisheries products towards Asean global market by establishing aquaculture cooperative

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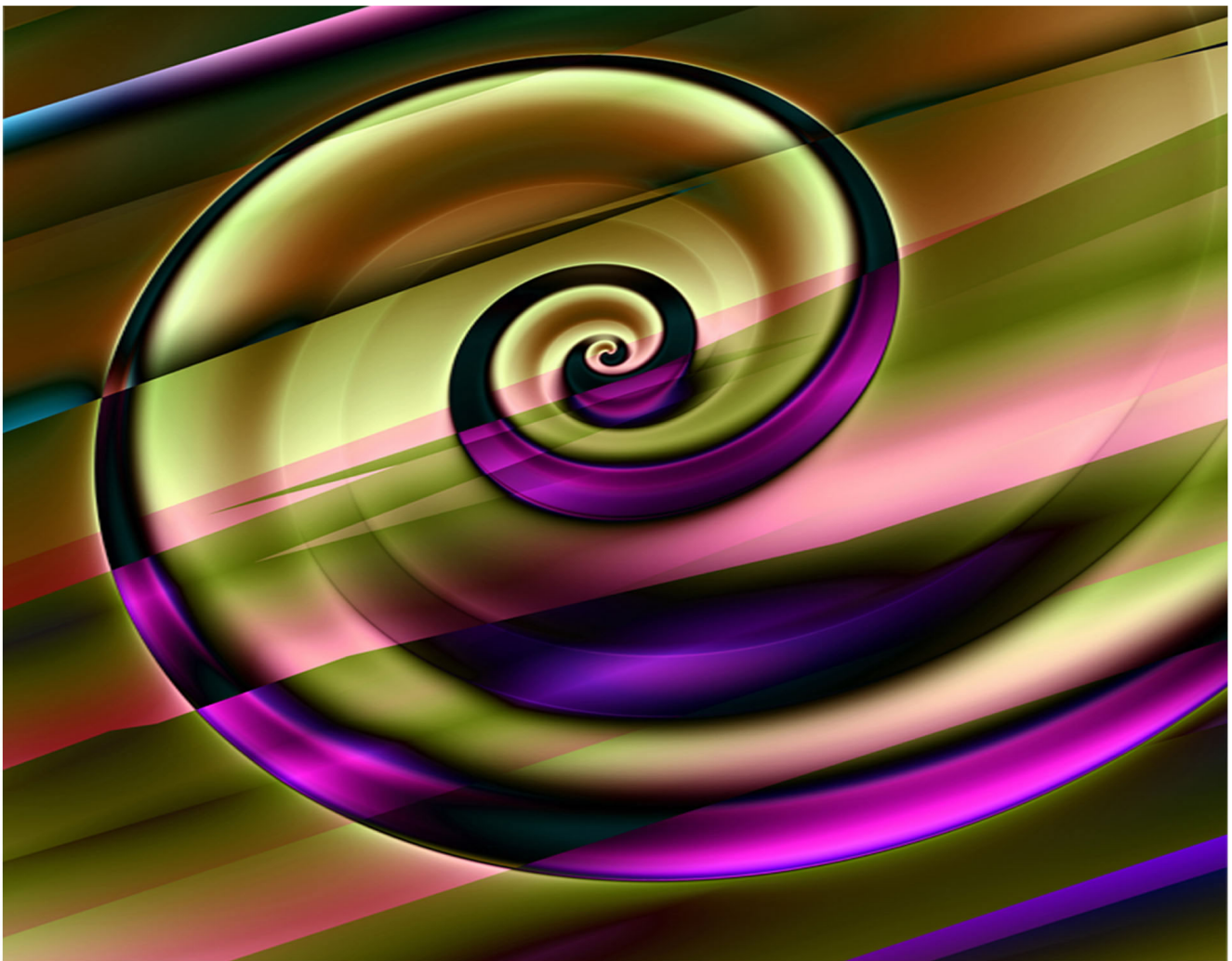
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**IMPROVING WADUK JATILUHUR'S FISHERIES PRODUCTS TOWARDS ASEAN GLOBAL MARKET
BY ESTABLISHING AQUACULTURE COOPERATIVE**

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ABSTRACT

Jatiluhur dam can be used as a fresh water fisheries. Along with the increasing demands of processed-fish products from Asean Countries, this could be considered as an opportunity for Indonesia to diversify and enhance its fisheries products by improving the Dam's capacity. The AFTA agreement should be taken seriously by stakeholders living around there. For example, to diversify income for a sustainable local economy growth. The income diversification by improving value-added fisheries as superior local products could be worked on by establishing "Integrated Micro Aquaculture Industry". This industry acts a channel for local enterprises to process raw fisheries products into a ready-to serve products. In order to pursue Integrated Aquaculture Industry, as a first step, we offer "Aquaculture Cooperative" to support that idea. The idea of Aquaculture Cooperative will be conducted by previously doing a research using qualitative approach with field research and the literature review as data collection techniques.

Keywords: Fish Farming, Aquaculture Cooperative, Integrated Micro Aquaculture Industry

1 INTRODUCTION

A fish farming especially in emerging countries is a potential business enterprise which is very worthwhile and profitable. The fish farming profits can be seen from the business opportunities offered. According to the production survey of the Directorate General of Fisheries in 2012, the total production of fishes from aquaculture reached 9,675,553 tons. Based on the data from Ministry of Marine Affairs and Fisheries, the level of the freshwater fish consumption in Indonesia in 2010 to 2012 roughly rose to 5.44 percent. In this case, in 2010 the level of the fish consumption reached 30.48 kilograms (kg) per capita per year, in 2011 reached 32.25 kg per capita per year and in 2012 the level reached 33.89 kg per capita per year. Meanwhile, the world fish consumption according to sources from the FAO can reach 19.6 kg in the year of 2021. When in the early 2000s the demand for freshwater fishes is only for raw fishes, since 2005 the demand is mainly for processed fish products such as smoked fishes, shredded fishes and fish fillets (Statistics Indonesia of The Republic Indonesia 2012).

The rising demand for freshwater fish consumptions of the world, supports countries which have freshwater-fishery resources to develop their freshwater fish production. Unfortunately, not all countries are able to maximise their potential freshwater fisheries. Indonesia as one of the countries which have the immense freshwater potential is required to maximise the opportunities as well as to be able to compete with other countries that have been developed more in growing their potential, one of which is Vietnam. Maximise not only in fishing ground use but also in techniques of farming, fish products and promotion or marketing. Commonly, freshwater fisheries resource that have by Indonesia focused on expanding the fisheries ground to increase amount of raw fish product without planning how to make it sustainable and containing value added on that fish product they sold. Whereas, now a days market demand on fisheries tend to decrease at smoked fishes, shredded fishes, fish fillet etc., than raw fish product.

One of freshwater fish productions which has same problem on utilize their resource located in the dam of Jatiluhur, Purwakarta, West Java. Based on the data which were obtained from the Department of Animal Husbandry and Fisheries Purwakarta, the overall number of fish productions in

2013 was 91,210.83 kg, including the number of the fish species that became major commodities which are carp (ikan mas), pangasius (ikan patin), and tilapia (ikan nila). Interestingly, that number is essentially declined from the previous year's production which was 112,265.82 kg. This is surely a paradox. Indonesia which has to be able to utilise the opportunities of the high demand for freshwater fish products from both domestic and international areas has decreased its domestic productions. From the observations conducted by the researchers, there were several problems in the utilisation of Jatiluhur dam as the area of the freshwater fish breeding. One of the problems that lead to the decline of fish productions in the dam is the excessive use of waters area in the dam. All this time, the fish farmers in Jatiluhur dam breed fishes using floating nets. To date, according the statement of the Regent of Purwakarta, Drs H Lily Hambali Hasan, as quoted by the Daily Pelita dated 30 July 2014; the number of floating net ponds in the dam has reached 4,714 ponds. Though, the ideal dam capacity is only 2,100 ponds. This overcapacity had led to the decline of the fish production as well as the quality of the Jatiluhur dam. It happened because the larger the number of floating net, the higher the sedimentation which was derived from the fish feeding in the dam. For the meantime, each year in the dam there is a frequent phenomenon called upwelling. It happens when the sedimentation on the bottom of the dam will rise to the surface, so that it will kill the fish on the surface. Not only the overcapacity made the floating net farmers do not obtain the prosperity of their lives, but also the low-price of the raw fish selling which is only 20000/ kg for export product It became one of the factors of the unmet demand for a decent living. And if farmers are able to cultivate these fish cages that have added value and the market, the results of fish cages can be sold up to 60000/ kg (Statistics Indonesia of The Republic Indonesia.2013.P:5).

Looking at the problem, it is necessary to the role of all stakeholders to find a solution to overcome these problems. One of the solutions proposed by the author is trying to formation of Aquaculture Cooperative which can optimize utilization of floating nets, diversify income and labour also to increasing value added of fish product in Jatiluhur dam.

1.1 Research Problems

Based on the background above, then this study focuses to a problem, which is how to optimize Waduk Jatiluhur's local potential face the challenge of the ASEAN economy community.

1.2 The aim of the Study

The aim of this study is to analyse and explain how to optimise the local potential of Jatiluhur dam in facing the economy face of challenge ASEAN economy community.

1.3 Concise Review

To support our research analysis, here is the basic theory we use:

1.3.1 Aquaculture cooperative

Aquaculture Cooperative was established to unify and gather the business of fishermen who are generally still poor and not so advanced in terms of the education level. Being united and working together in the fishery cooperative, fishermen can raise their capital and endeavour improving their business by not relying on middlemen or the fate of investors (Sagimun in Trisya in Muyasaroh, 2004). Fishery cooperative or Mina cooperative functions as a centre of economic activities of fishermen in the coastal villages. The work which is done is based on the means, the services and the conveniences that are needed for the work of the fishermen members of the fisheries (Department of Cooperatives in Muyasaroh, 2004). The purpose of the cooperative is, as the purpose of the aquaculture cooperative in general, namely: (1) to promote the welfare of its members; (2) to promote the welfare of the society, (3) to participate and build the national economy.

The 2009 Indonesia act number 45 on fishery affairs article 25c declare that government as regulator foster the implementation of togetherness and great partnership between fishing industry and fishing cooperatives. Based on it Indonesia create fishery cooperative named Induk Koperasi Perikanan Indonesia

(Indonesian Fisheries Cooperative) to control fishery affairs system in capital specifically. Sometimes, fishery farmers producing a common product will form cooperative to ensure widespread education about production techniques, about market developments, about legislatives activities, and about other issues that affect their scope. The Indonesian cooperatives unfortunately not provide all of farmers need include expansion their markets, diversify the product or trained to increase their technique skill on fish cultivation. (Minnesota Association of Cooperatives 1994)

A formal cooperative need not established to perform these functions. Certainly, Aquaculture Cooperative that author launched have already made great strides in all of these areas without turning to the cooperatives model.

1.3.2 Floating net

Floating net is a fish farming system in form of a net whose construction is floating on the water with the net is below it using polyethylene materials. The shape and the size are various and strongly influenced by the type of the farmed fish, the fish size and the fishery depth. If it is viewed from the type of business, this business is a capital-intensive business type which needs the operational costs that are not in little amount, especially for fish feeding. Based on the analysis estimation, the work done by the floating net cages entrepreneurs would cost about 50 million dollars for every four plots of floating net cages. The biggest outflow is for the fish feeding which reaches 10 million dollars. This is one of the reasons why the cage farmers have difficulty in finding the capital for the floating net cages (Supriyadi, 2004. P 23)

2 RESEARCH METHOD

The research method used in this paper is a qualitative research that combines the result data of literature reviews, rapid assessments trough depth interview and field observations in the Jatiluhur dam and in the field observations. the literature review method which was obtained from the national research journals, supported by relevant data from the Directorate General of Aquaculture (Ditjen PB), Ministry of Maritime Affairs and Fisheries, thesis, and other supporting materials. In rapid assessment trough depth interview as data collecting techniques done by interviewing variety stakeholders in Jatiluhur dam which are the owner of the floating nets, local people (housewife, floating net's farmers, consumers), fish feeding supplier, local government and Jasa Tirta III as Jatiluhur dam's manager. The whole respondent needed to collect holistic data from up to bottom.

The retrieval and citation of the data and information were aimed to support the statement and the idea of the author. . The research problems were discussed and resolved by analysing the data and the theory. In addition, the conclusions that relevant with discussion and research purposes were synthesised.

To strengthen the existing data, the authors also conducted a rapid assessment and a field observation in the region of Jatiluhur to match the conditions of the field and the conditions of society resulted by the literature review with the actual conditions occur. The author also conducted interviews with residents, the floating net owners, and the government in the dam area to ensure further the implementation possibility of the solutions we offered.

The characteristics and forms of the report presented are the descriptive report. This paper describes the aquaculture cooperative along with the illustration of the integrated aquaculture industry that will be implemented

3 RESULTS

The development project of Jatiluhur dam which is an attempt of damming the Citarum river was built for the purposes of not only making the irrigation and electricity, but also making a raw water supply, a flood control, a flushing town, inland fisheries, and a tourism place. For the purpose of fisheries, Jatiluhur has created a new job opportunities for local people through a business of floating net cages which has been running for more than 10 years. Jatiluhur is surrounded by the district of Jatiluhur, Sukasari, Mantiis,

Tegal Waru and Sukatani. The floating nets which is located in Jatiluhur dam can produce carp (ikan mas), pangasius (ikan patin), and tilapia (ikan nila).

Table 1: Population per village according to the District in Purwakarta in 2012

Districts	Residents		
	L	P	L+P
Jatiluhur	31360	30571	61931
Sukasari	7424	7031	14455
Maniis	16055	15150	31205
Tegalwaru	22937	21223	44160
Sukatani	33378	30352	63730

Source: Statistics of Purwakarta Regency

Based on the data presented above, the 45% was a productive population. The 70% of productive-aged men worked as a farmer specifically as the farmers of (floating net) while the remaining worked and migrated as a builder (constructor). On the other hand, the 65% of productive-aged women lived as a housewife and the rest worked as a migrant worker or a civil servant. The number of floating net in Jatiluhur region in 2012 was 2135 pieces. That was spread over in Jatiluhur district with the number of (620), Sukasari (180), Maniis (899), Tegalwaru (120) and Sukatani (316). That number rose significantly each year exceeding the capacity of Jatiluhur dam which was managed by PT Jasa Tirta. (BPS, 2013). The floating-net farmers were able to produce 90.56 tons of freshwater fishes per year. These fishes were sold to the distributors of raw fish in markets or sold to consumers on the streets. This indicated that the economy capacity of floating net farmers did not improve.

From the data found in the field, the farmers who relied on floating net cages as the economy claimed that their floating net business was not growing because of the following things:

Table 2: Floating Net's Farmers Threats

No	Constraints	Constraint Forms	Effects
2	Ponds	Farmers did not know the exact dose for the pond fertilization. The fertilization was given only based on the estimation. Farmers had not understood that the shape of the ponds influences the maintenance of the pond. The pond embankment was under-treated.	The improper fertilization also affected the fish grows. The improper pond shape caused the pond difficult to dry; resulting farmers used water pumps which certainly would increase the production costs. The untreated embankment often caused the embankment ruins and the fish comes out of the pond
3	Feeds	The feed price is very expensive. When feeding, the farmers did not take into account the needs of fish consumptions with the weight of the fish.	The costs of feed production increased. Farmers struggled to meet the market demand which set the ratio standard of 4:1 (4 heads for 1 kg)
4	Upwelling	The huge amount of sedimentation that came from the fish feeding in the dam would be higher	Killing the fishes on the surface of water
6	Sowing Seeds	Farmers did not know how to set the time pattern for sowing	Caused the fish production constraints because

			sometimes in one month the fish harvest was abundant and sometimes was very little
7	Marketing	The marketing was done only to meet the needs of people's daily consumption / for the celebration events and for the salesmen	Farmers struggled to develop the sale of fisheries
8	Safety	Farmers did not provide lighting in the pond area. Farmers did not cooperate with the security officers of the area	Fish theft occurred

Source: Field Research Data (Fish Farmer Interviewed Results)

Generally, the problems which are described above are due to the lack of the capital, knowledge and government assistance during the breeding process and the sale. This requires holistic institution assistance to the community from the breeding to the harvest of the fish, the fish product processing, and the marketing. Thus, farmers are no longer in debt to buy fish food, meet the needs of difficulty in accessing the technology and market. The institution that is suitable for such holistic guidance is Aquaculture Cooperative.

4 DISCUSSION

4.1 The Society Target of the Aquaculture Cooperative

There are three target groups of this aquaculture cooperative, namely:

4.1.1 *The Floating Net Farmers*

The floating net farmers are divided into two types, the first farmer is who have floating nets as well as a worker or self-employee and a farmer who only keeps an eye of the floating nets of him and hire employees to take care of this business or entrepreneur.

The floating net farmers, both the self-employee and the entrepreneur had many problems affecting their business, such as:

1. Feeding inefficiently, whereas the fish feeding was the highest cost in the floating net business
2. he theft of fishes and fish feeds, caused by being both of misappropriated by employees and stolen by outsiders who deliberately stole into the cage area.
3. The fluctuation of the seed and feed price as a result of the games of the suppliers of the fish seed and feed from outside Purwakarta and they came directly to the location of the cage.
4. The fish selling price also fluctuates because of the fish croupier Bandar games
5. The difficulty of getting the business capital for the development and the maintenance of the business, though this is a capital intensive business

4.1.2 *Local Investors*

The authorised local investor only limits on workers and employers in the dam area. There are some problems that they are experiencing related to the management of their property investments, that is:

1. The lack of management or investment management institutions that can help manage their wealth
2. Investors in particular migrant workers prefer to invest their wealth in the form of the house, whereas the house is not a liquid investments.

4.1.3 *The General Company of Jasa Tirta II*

Jasa Tirta Public Corporation as a company authorized to manage the dam had problems, namely:

- Managing the number of floating net cages that becomes bigger, so that it can reduce the carrying capacity of the dam, whereas the function of the dam is for the power production, the source of drinking water and the agricultural irrigation.

Based on the problems of the three target groups, the authors finally assessed to bring together all of them in aquaculture cooperative because they are highly related to the investment management system of the Aquaculture Cooperative.

4.1.4 Local Government

Local governments take responsible to harm their local economies to decrease welfare of society. Furthermore, local governments should educate the public on the impacts of business-related development and create a plan that is consistent with the values of local citizens (Myles.2005)

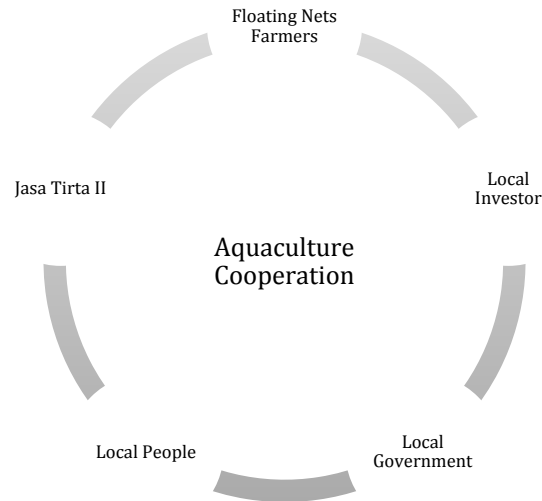


Figure 1: The Society Target of the Aquaculture Cooperative

4.2 The Illustration of Aquaculture Cooperative

Aquaculture Cooperative is a cooperative that aims to improve the efficiency of utilisation of the dam fishery potential. Aquaculture Cooperative serves as a place for farmers to be able to utilise the results of the dam fisheries. All this time, with the number of limited capacity, the Jatiluhur dam continues to be used to establish floating net to meet Jatiluhur livelihoods as fish farmers. While in the long run, it will only decrease the economic value of the dam. The Aquaculture Cooperative is expected to provide a solution by providing facilities and training for Jatiluhur's local people to process the results of its fisheries. Thus, it is expected there will be an income diversification of the societies around Jatiluhur dam who ultimately will not depend anymore on the floating net results which are not sustainable in the long term.

According to the results of observations that have been made, there has been only one place of the fish processing, namely CV. Karunia Mitra Makmur which focus on the processing of the fish fillets. At the beginning of the operation, this company was only capable of processing 100 kg of fishes per day. That number was still lower than the number of fish production in the dam that had more than 90,000 kg per year or about 253 kg per day (Haryono,2014). One of the types of the fish that has high demand for its processed products is patin, not only in the form of processed patin fillets but also smoked patins. According to Saut P. Hutagalung, the Director General of P2HP (Processing and Marketing of Fishery Products) Ministry of Marine Affairs and Fisheries, the need of patin fillets domestically is about 400-450 tons per month, or approximately 13-15 tons per day. Meanwhile, there is also a high demand from Singapore and Malaysia to the processed patin in the form of smoked patin. Since the year of 2010 to 2012, the estimated exports of smoked patin to that two ASEAN countries reached three tons. Seeing the potential of such high demand, if there is no appropriate measures, then the processed products of

Indonesian freshwater fishes will not compete the processed products from challenging countries, such as Vietnam as the largest exporting country of the freshwater fish in the world, which is also the country in the same region.

Aquaculture Cooperative as an economic institution also has the function of society empowerment. The targeted societies are women in their productive age, since the majority of women in the dam region are only work as housewives. An empowerment system that can be offered by the aquaculture cooperative is to provide training for fish farmers in Jatiluhur to be able to process the fishery products independently to provide additional values to the dam fishery products. Thus, the freshwater fish products in the dam are no longer marketed in the raw form. Furthermore, by the empowerment, there will be a diversified income of the Jatiluhur society and people do not depend on floating net results anymore, which in the long term are no longer sustainable. In addition, to meet the demand for the exported freshwater fish, the fish cannot be sent in the fresh/ raw form. This is because the distribution of fish for export demands requires a relatively longer time due to the long distances covered to reach the market, so that the fish will no longer be fresh when it arrived. By doing the processing, the fish will have a longer durability so it will not reduce the quality of the fish itself.

In return, the processed fish that has been processed by the society will be sold to the Aquaculture Cooperative. This will benefit both parties, both the society and the Aquaculture Cooperative. The society will not find it difficult to market the processed fishes. It is given that the public access toward the processed fish market is still limited, especially the access to export markets. Therefore, the aquaculture cooperative will also coordinate with relevant ministries to expand the export destinations for the processed freshwater fish. Thus, all stakeholders including the public, cooperative, and also the government will be involved directly in order to provide greater benefits for freshwater fishery industry in Indonesia both macro and micro. The aquaculture cooperative will take benefits by getting a direct processed-fish result from the farmers and do not need to set up a processing factory that requires huge cost.

Aquaculture serves as the organization with the investment management that provides benefits to three interest groups in the region of Jatiluhur, that is: floating net farmers, farmers who will perform their own fish processing which requires additional capitals and local investors who require investment management. This system has a working mechanism as a container investment from local investors and financiers to the floating net farmers and fish farmers who process the fish products.

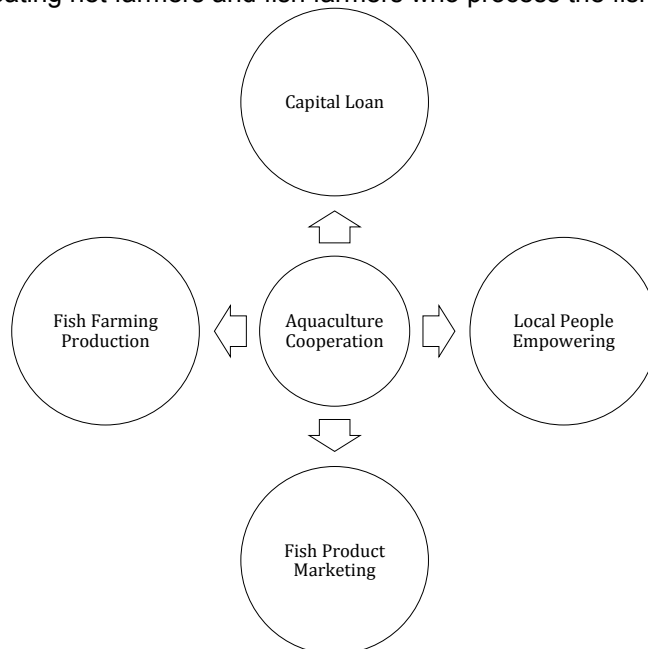


Figure 2: The Illustration of Aquaculture Cooperative trough Integrated Industry

The mechanism of this cooperative investment management is:

1. Collecting the capital from local investors
2. Providing the means and facilities for the fish processing training independently

3. Giving capital lending services to the floating net farmers. This capital can be used by floating net farmers to develop the fish processing.
4. Providing a business training and introduction of new technologies for floating net farmers
5. Dividing the profits to investors. The investment which is entered through a cooperative investment is expected to come back and share profits through the Business Profits.

5 CONCLUSIONS

Jatiluhur which became the backbone of the livelihoods of the majority of the surrounding communities has degraded economic values. This is because the utilisation has exceeded the carrying capacity of its environment. As a result, there was a decline in production of freshwater fish in the dam that should be able to be used as the local potential having the export competitiveness. Aquaculture cooperative is the solution that is offered by the authors for returns Jatiluhur to its economy value while maximising its potential as competitive export products to the Asean Economic Community in 2015, since the high demand for freshwater fish processed both in the Asean region and in the world. The systems that is offered by the Aquaculture Cooperative of Jatiluhur is the empowerment of local people to be able to process their fishery products independently which then will be marketed by the Aquaculture Cooperative in collaboration with a number of relevant ministries to be able to meet the standard export fishery products. Besides the empowerment, the Aquaculture cooperative also perform investment management in order to meet the funding needs for farmers of KJA and also people who need the capital to develop their fish processing independently. Besides the diversification of people incomes in Jatiluhur, this system is expected to create the efficient utilisation of the dam so that its potential can be maximised. Finally, the fishery dam will have the additional value that can provide export competitiveness while create the local fishing industry which is developed and independent.

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