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Fishery Based-Processing Enterprises Integration for the Coastal Community Development

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Abstract: Indonesia as a maritime country, coastal and marine has potential economic sector to improve the welfare of coastal communities. One activity that can encourage economic activities of the coastal communities is the development of integrated enterprises between the aquaculture and fishing with processing. All of the processing that is integrated with the cultivation and fishing provides the benefits to coastal communities such as integration with the enterprises of catfish crackers, seaweed dodol with seaweed cultivation, curing fish, dried fish and fish balls producers. The main actors of fishery processing enterprises are the women or the wifes of fishermen. The integration of these enterprises creates an increased in revenues through the increases of value added, price of fresh fish and price stability of the fish. This activity encourages an optimal utilization of coastal resources, gender relation, strenghtening fishermen group and support simultaneously the conservation of fishery resources. Therefore, these integrated enterprises could be recommended as a model of economic empowerment for the coastal communities.

Key words: Fishing, culture, floating net, processing, gender relation, benefit

INTRODUCTION

Integration between different businesses is a form of mutual symbiosis and resultant outcome that produces multiple effects in the form of added value and greater employment opportunities (Darma *et al*., 2015). Business integration between processing and fishery enterprises such as aquaculture and fishing is able to increase the production and value added, price stability and continuity of production which in turn increase the income of the coastal communities. This model plays a big role in social and economic aspects, therefore, it is neccessary to be developed in Indonesia as a maritime country.

Indonesia has abundant natural resources with around 17,000 islands; a coastline over 81,000 km and various types of natural resources from the sea, ranging from coral reefs, seaweed, mangrove, estuary of the river to the small islands. However, this potential has not improved the community welfare yet. The number of poverty in coastal areas and islands remains high. The percentage of the poor people in coastal areas was around 27% of the population living in coastal areas. In 2010, the poor reached 35 million people or 13.33% of the total population with approximately, 237 million people in Indonesia (CBS., 2011). There were approximately, 10 million people in coastal areas, comprising 7.87 million were poor people and 2.2 million were very poor, respectively (CBS., 2011).

The fishery coummunities have several problems such as: fishing activities confront with the harsh natural conditions that creates uncertainty to run their fishing activities; they have low level of education and skill; they live in consumptive lifestyle (for instance, at which they get much income, they do not save for the famine preparation or business investment but used as an opportunity to purchase secondary needs) and they lack of knowledge to handle and process catches immediately, as the catches are perishable and cannot be delayed causing they are exploited by middlemen with low prices (Panayotou, 1982; Rahmatullah, 2010). In addition, less developed fishing activities for coastal communities in Indonesia is caused by some reasons. Firstly, catching business activities are not continuous, low level of certainty and high business risks. Secondly, fishing activities are considered as a pleasure activity for fishermen and become lifestyle as a preference for a particular way of life. Thus, whatever happens with the situation is not considered as a problem. Thirdly, activity in agriculture and animal husbandary undertaken by community in coastal are not considered as a fishery sector, even though this activity is part of the maritime culture (Panayotou, 1982; Abdullah, 1993).

The development of processing activities and coastal aquaculture by integrating with fishing could improve business efficiency, increasing revenue and finally reducing poverty (Darma *et al*, 2015). The integration

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scheme would increase number of enterprises established by coastal communities and transform the sector from full risk of fishing activities, uncertainties, relatively greater capital requirements to the nature of enterprises that are routine, less risk and small investment. This business development can change behavior and preference from consumptive to investment oriented in order to increase revenue. This behavioral change can overcome poverty and reduce degradation of coastal environment. The destruction of coastal ecosystems is resulting from fishing activities that do not follow the principle of sustainable management of fishery resources. One attempt to solve this problem is through COREMAP II. The purpose of this initiative is to increase the income of fishermen and businesses certainty and at the same time to reduce the threat for coral reefs destruction by reducing fishing activities using potassium bombs and use of trawling gear that destroy coral reef ecosystems. Better management system of fishery resources can reduce coastal ecosystem destruction and improve social welfare through the development of integrated business.

The purpose of this study was to analyze the feasibility of processing enterprises that is integrated with farming, catching and its impact on business sustainability including the development of coastal tourism and conservation of fishery resources. The enterprises integration is expected to be developed as a model for economic development of coastal communities by changing the dominance of extractive business to the dominance of aquaculture; primary products or raw materials to produce high value products and from consumptive to saving preference. It is expected that the coastal communities will have a continuously and controlled business, a planned consumption pattern and saving preference for business development.

Conceptual framework: Fishery enterprises integration is an agro-industry business development strategy in which integration between fishery aquaculture, catch and processing activities that aims to ensure steady supply of raw materials for agro-industry and assurance of products for local markets (Mckeller and Smardon, 2012). Processing enterprises is one of agribusiness subsystems that carries out activities that change the form, considered as a form utility, generates value-added and at the same time is an indicator of the development progress of agriculture including a shift in the economic structure of primary to secondary industry. The processing activities of agricultural and fishery products are able to significantly contribute to the development in many developing countries. Diversified products and value-added generated from processing activities simultaneously create employment opportunities both on farm and off farm and reduce the problem of urbanization (Austin, 1981; Silva and Fernandes, 1999; Slamet, 2004). The form of enterprises integration which is allied and currently on the system is a form of agribusiness or fishery business where every type of business is a subsystem of fishery business is also called as a system. Business system in coastal fisheries has a simple organization and management. Although, the management of businesses is under one group or organization, the business is still dominantly managed by individual. Therefore, fishing business managed by coastal communities is likely closer to the concept of agribusiness which is every type of integrated business is agribusiness subsystem (Saragih, 2001).

Many types of businesses can be developed by coastal communities due to great potential coastal resource with abundant potential of fishery products. One business that is very potential to be developed is the processing of fishery products. The development of processing activities in the fishery sector is able to encourage the development of coastal areas and the equl distribution of economic activity. This condition will make the fishery subsector to play an important role for poverty alleviation, economic development and simultaneously accelerate and sustain the economic growth (Kawagoe *et al*., 1987; Johnston and Mellor, 1995). With the processing technology, the availability of food at the right time, location and quantity and the nutritional needs for health can also be met (Alexandratos, 1995). Processing activities helps to solve problems of fishery products which is perishable, seasonal, strongly influue in distribution such as production and unstable prices, usually produced even in remote/isolated region, so it faces issue in distribution such as heavy mass transport, large volume and distances from the production site to the consumer. Development of rural-based fishery product processing industry can solve problems and improve the welfare of fisheries and coastal communities (Adjid, 1995).

Value added could be created by coastal communities from primary or raw material products into refined products such as processing fish keumamah, salted fish, dried anchovies, crackers, fish balls, jerky fish, shredded and other types of processed fishery products. Appropriate technology which was introduced on soft shell crab processing activities carried out by Small Medium Enterprises (SMEs) could improve the value added, marketing network and quality of human resources, increase crab cultivation as a provider of raw materials and labor (Fudjaja and Fujaya,

2014). Organization for fishermen also is strengthened through the business integration. Groups and fishing business is developed through integration between the crab processing activities undertaken by fishermen's wives and catching crabs done by her husband (Amandaria, 2014).

Enterprises integration between processing and aquaculture and fishing enterprises encourage optimal and efficient resource use and the development of each integrated enterprise. The vertical integratio of small-scale businesses between supplier of raw materials and processing are likely to provide higher prices for suppliers, the efficiency of the processors and encourages the strengthening of producer organizations (Lazonick, 1993; Moss and Schmitz, 2000; Mutura *et al*., 2016). Enterprises integration will encourage the strengthening of producer organization, so as getting an additional benefit from the collective action (Mutura *et al*., 2016).

Agriculture and food processing industry related to vertical and horizontal integration are relaying on several literatures sources (Bamiro *et al*., 2006; Manjunanth *et al*., 2014; Soosay *et al*., 2008; Sievanen, 2014). The summary of the advantages of Integrated Farming System (IFS) that could be considered strongly related to fishery enterprises are: the integration of fishery enterprises provides flow of money to the fishermen round the year by way of continued production process, integrated farming system forces the entrepreneurs to know more things and hence improves the literacy level greater sustainability in production on fishery enterprises due to integration of diverse enterprises of different economic importance, integration of different production systems provides an opportunity to solve malnutrition problem due to production of variety of food products, improving profitability achieved mainly by way of reduced costs due to recycling of wastes of one enterprise as energy inputs for other enterprises, recycling of wastes being in built in the system, this helps to reduce dependence on external inputs, thus, conserving natural and scarce resources, the recycling of wastes for production helps to avoid piling of wastes and consequent pollution and overall benefit of IFS is improved standard of living of the fishermen.

MATERIALS AND METHODS

The study was conducted on the territory of the island of Sumatera, specifically at the districts of Nias, North Tapanuli and Central Tapanuli in North Sumatra Province, district of Mentawai in West Sumatera Province, districts of Batam, Bintan and Lingga, in Kepulauan Riau Province. The research was a case study with data collected on the fishing managed coastal communities in the area of Coremap II (2005-2011). The assessment of fishing business assessed was investment activities funded by Coremap II. Business activities funded by Coremap but converted into more profitable other businesses and investments funded by the coastal communities itself. The types of enterprise were analyzed which were smoked fish, dried fish, fish ball, seaweed dodol, crackers catfish, tamban fish crackers, tamban fish chips, catfish culture and culture using on Fixed Cage Net (FCN). Data collected include the value of investments, raw materials, operating costs, production values and a source of raw materials. Data was analyzed to illustrate the feasibility of business, consists of investment value, integration enterprises perfomance, the development prospects of the business and the impact resulting from the business integration. Financial feasibility is measured by R/C ratio, the cost components that consist of cash expenses and depreciation of investment, conversion factor and depriciation. Depreciation calculation method used is the straight-line method.

RESULTS AND DISCUSSION

Business integration between fixed cage net and fishing: Fixed Cage Net (FCN-Keramba Jaring Tancap) is developed as a fishing community empowerment activity to reduce fishing activity and encourage fish aquculture as well as regulate fishing activities. FCN development goal is to utilize the labor force beyond the time of fishing, to use of waste in the form of trash fish catches because it is used as feed and ultimately to increase value added production in the form of increasing size of fish. The result of fishing activity in a small size with high economic value such as grouper fish can be reared in cages before being sold while fish catches with a low value or quality can be used as feed. This model is a horizontal business integration to increase the income of fishing communities. Horizontal integration in the product chain in the fishery and agriculture sectors in Hungary is a model that can reduce losses or boost profits (Szucs and Szollosi, 2014). However, enterprise integration of FCN developed by coastal communities do not fit with the expectation. FCN businesses run by community in Riau Island funded by Coremap II where almost all the cost components are covered by the project as a result these businesses can not be profitable. The benefits obtained by fisherman is worth about 90% of total investment and operational costs financed by Coremap II, so, when the program ends, the businesses would also be stopped (Table 1).

The investment of FCN construction and operational costs for fry and feed was about IDR 10 million per unit of FCN or approximately, IDR 20-50 million for each business unit or approximately, IDR 200-300 million per fishermen group. This value is not proportional to the production

Table 1: Financial performance of FCN in three district of Kepulauan Riau Province, 2012 (in IDR1,000)

Description/Unit	Karas Village, Batam District	Limbung Village, Lingga District	Malang Rapat Village, Bintan District
Number of FCN (3×4×3 m) (Unit)	5	3	2
Investment (IDR)	17.990	10.500	9.930
Depriciation (IDR)	6.327	3.428	2.342
Variable cost (IDR)	41.400	15.290	16520
Sero/net (IDR)	600	300	200
Fry (IDR)	32.650	12168	13.060
Feed (IDR)	7.000	2.132.9	2.800
Medicine (IDR)	1.150	690	460
Value of production (IDR)	31.073	11.236	6.750
Net benefit (5-4) (IDR)	-16.654	-7.483,4	-12.112
Total cost (3+4) (IDR)	47.727,0	18.718,9	18.862
Fishermen cash contribution (10% from No. 7) (IDR)	4.772	1871.8892	1.886
Net benefit (5-8) (IDR)	26.300	9.364	4.863

Data collection in 2012

cost, so, the fisherman took the opportunity to obtain assistance from the project. Fishermen can take margin from the sale of production as a return on investment after maintenance activities carried out. FCN is used as a means to get support from the project. In general, farmers stopped trying after the age of technical FCN exhausted. Technical age of FCN is only 2 years, so, production can be done is 2-3 production cycles, causing the value of the resulting production is smaller than the total investment and operating costs. Approximately, 90% of the costs borne by the project or only about 10% is borne by fishermen. The forms of costs borne by fishermen were only the cost of FCN construction that the materials are available locally and can be obtained for free or purchased at a bargain price. Waste feed in the form of catches are considered as trash fish and even sometimes no value or low price. The revenue and net income gained by farmers is the value of return on investment and operational costs which is 90% funded by projects.

Other factors cause FCN does not work well is changing the behavior of fishermen from fishing is free or not bound from one order and obtain revenues almost every day between Rp. 50.000-200.000/day to fishermen group who have to wait at least 6-8 months with feeding and maintaining a regular basis every day, a very high risk such as death, blows of the waves and robbery. In addition, a very large capital needs at a price of Rp. 17.500-20.000 seeds/head or the value of approximately, Rp. 20 million which is a huge amount of money for fishermen. So that, grouper aquaculture is difficult to be operated by the small fishermen. The number of group members is decreased or split into smaller groups with 2-3 members or each member run grouper culture with the cage that has been handed over from a group to the individual. In addition, the cultured grouper is derived from the catch by using traps. The advantage of this business is free seeds, selling time can be set at the time of the expensive price of fish and growing fish culture is considered as savings.

Based on the above description, the fishing community empowerment program through the development of FCN has created positive and negative impacts. The positive impact is that the farmers already understand the continuous production and use of waste fish catches, so, beneficiaries of FCN in the district Central Tapanuli has reinvested the return of FCN into catfish farming with the aim to utilize the waste of catches in the form of trash fish.

The program of FCN also has also generated negative impacts for fishermen. It has created a destructive social order for coastal communities as a result of requiring to work in groups to develop fish culture of FCN. Social harmony is disrupted due to unproportional contribution of each member involved while the gains should be shared equally. There are even members who are considered as free riders perceived that all coastal communities are entitled to such assistance from the project. Another failure of FCN managed coastal communities is a long production period which is a minimum of 8 months with a very high risk such as storms, robbery and fish death. Long production period of FCN is very different from those fishermen who can earn every day from fishing.

The integration of processing and fishing: The integration of processing and fishing activities can increase the value added, the income of fishermen and the people's social relations of the coastal community (Belton and Little, 2011; Hobbs and Young, 2000). Additionally, enterprise integration aims to reduce costs by utilizing as much as possible internal input. Integrated farming is a pattern of resource use on a regular basis, takes place naturally and not using the external input (Titi, 1992). The integration is made in such a way that product of one component should be sourced by other enterprises with high degree of complimentary effects on each other (Manjunatha *et al*., 2014). Fish processing is intended to increase the value added of the catch and at

Table 2: Financial analysis for processing enterprises

Description	Smoked fish, Nort Nias District	Dried fish, Mentawai District	Fishball Kabupaten Mentawai	Tamban fish chips, Batam District	Tamban fish cracker Batam District
Investment	6.417.500	2.715.000	900.000	710.000	8.910.000
Depreciation	1.283.500	1.460.000	211.667	580.000	3.125.000
Operational cost					
Raw material	400.000	1.875.000	76.000	90.000	175.000
Other variable cost	35.000	46.000	13.000	11.500	293.500
Total variable cost	435.000	1.921.000	89.000	101.500	468.500
Value of production	600.000	2.500.000	150.000	200.000	646.000
Profit	165.000	625.000	61000		177.500
Conversion factor	40%	40%	75%	25%	34%
Number of production period (year)	240	32	48	48	100
R/C ratio	1.36	1.27	1.61	1.76	1.2

Data collection in 2012

the same time overcome the excess production. Smoked fish processing performed in North Nias, North Sumatra Province and drying fish and processing fish balls in Mentawai District of West Sumatera Province which are the integration bussines among members of the group of fishermen funded by Coremap II. In one group of fishing communities, there are different activities, namely processing and fishing activities. All processing activities provide benefits for fishermen, including fishermen whose businesses are fishing. The catch is processed in the form of smoked fish, dried fish, fish balls, fish chips and fish crackers that provide added value and marketable (Table 2).

The performance of fishery processing is based on kin-based capital and labour was highly adaptive (Ginkel, 2014). Investment value was very small between IDR one and ten million with low operational costs but provides a gain of about 20-76% or R/C ratio range of 1.27-1.76. The advantage of this activity is good enough for the fishing community because fishing and processing activities can take place on a regular basis throughout the year. Procurement of raw materials of fish is relative continuously as it is formed in a system between the fishing and processing. There is a specialization occurring within a group, one group or individual who specializes in processing activities and partnering with individual fishermen or groups of fishermen. There are also members who perform processing or catching, husbands do catching and wives do processing. Meanwhile, marketing is done in the form of free marketing and partnerships. Marketing process of chips and crackers is in the form of a partnership while the smoked fish, dried fish and fish balls are marketed individually. There is a stong gender relation due to different role and job specialization in the fishery enterprises (Forstner, 2013; Tanwir and Safdar, 2013). Processing activities are mostly run by women or the wives of fishesment. Smoked and dried fish are done by the wife and the husband of fisherment with different task in processing fish, tamban fish chips and cracker are done by women or wive of fisherment.

Smoked fish: Smoked fish is managed by coastal community in the beach of Ture Galoko, Tuho Balofadoro Village, District of North Nias. Smoked fish business is a great benefit to coastal communities and the region because the beach is a tourist attraction visited by many people. The specialty of this beach is because of its proximity, just 4 km from the sub-district Lahewa, 25 km from the Lotu, the capital city of North Nias District and 80 km can be reached in approximately, 2 h by four wheel drive from the city of Gunung Sitoli. There are five households who operate smoked fish business who were granted financial support from Coremap II project in the form of venture investment and working capital of Rp. 2 million per household and labor for stove construction borned by fishermen. The existence of the smoked fish has become one of tourist attractions in the beach in Ture Galoko. Another impact of the smoked fish business is an increase in prices of Bayan and Sai fishes and fishing activities. Bayan fish prices increased from IDR 3000-5000-10,000/kg with a conversion rate of 50 kg wet fish into 17-19 smoked fish at a price of IDR 40.000-60,000/kg. The price of Sai fish changed from no price to IDR 6,000/kg with a conversion rate of 50 kg wet fish become to 14-17 kg of smoked fish at a price of Rp. 30,000-50,000/kg. Smoked fish can hold in two weeks without incorporated stored in the refrigerator. The number of fish is required a minimum of 250 kg per day for the five business units of smoked fish. Smoked fish business development is in line with the development of beach tourism. After the smoked fish business growing, this region already visited by 500-2000 tourists during the weekend which had previously only visited by about 50-100 people. The Ture Galoko beach turned into a wider space of beach of after the earthquake in 2005. There is also a football court formed after the earthquake and used to play football by youth in the district of North Nias and also means of coastal reacration.

Cracker and fish of tamban fish: Crackers and chips of tamban fishes are processed in the districts of Karas and Batam. Both of these businesses managed by coastal

Table 3: The fincial analysis of catfish culture in Desa Jago-Jago, district of West Tapanuli

Description	Unit	Value (IDR)	Notes
Fry@IDR 250	3000 ekor	750,000	
Feed F99@IDR 135,000	1 package	135,000	
Feed F 781-2@IDR 330,000	1 package	330,000	
Wast feed@IDR 1,000	75 kg	75,000	Self production
Feed from project@IDR 500/kg	165.5 kg	82,750	Group development
Total Variabke Cost		1,372,750	
Value of productio@IDR16,000/kg	165.5 kg	2,689,000	The 3 months per production cycle
Net benefit	IDR	1,275,250	
Net benefit for a year	IDR	3,825,750	
Depreciaation	IDR	352,500	
Net benefir for a year		3,473,250	
R/C rasio		1,80	

Data collected on 2012

communities are provitable because the investment and operating costs are low using and simple processing technology. The production cycle is 2-3 days that is influenced by the drying of the Sun. The product is marketed in the cities of Tanjung Pinang and Batam. This business is profitable when tamban fish price as raw material is not more than IDR 5,000/kg.

Processsing of dried fish and fishballs: The development of dry fish is done by Pokmas-kelompok Masyarakat (community group) named Jati Berkembang in Tua Pejat Village, district of Mentawai with five members including one member as a member Pokma's wife who process fish into fishballs. Pokmas was given operating capital as much as IDR 10 million by the Coremap II project to finance the operational costs of fishing and fish processing. Two members of Pokmas are specialized for dried fish and fish balls processing and other three members doing fishing.

The average of fish purchased is 45 kg for about 4-5 months in peak season and 6-8 kg in the off season. The catching production is low due to frequent major storms in the Mentawai Island. This condition makes the Mentawai Island in West Sumatera Province became one of the attractions for surfing visited by Foreign tourists.

Processing and aquaculture enterprise integration: Farming and processing business integration is a form of vertical integration of enterprises in the fisheries sector. This business is intended to encourage people to take advantage of labor at a time outside the fishing season to train them to run business which is planned and controlled and to increase production and value-added products. This model is a form of business integration in which farm families allocate resources for efficient utilization of the existing enterprises to enhance productivity and profitability of the farm (Kuruvilla and Mathew, 2009).

Two types of aquaculture activities which are integrated with processing activities are the cultivation of seaweed and catfish. Seaweed farming activities were not analyzed because the business is not integrated with the fishing enterprise while catfish farming is integrated with the fishing enterprise. Both of these processing activities can provide benefits to coastal community both for households and farmers seaweed processing and catfish culture. Business analysis is done only in the business of processing and catfish while seaweed farming was not analyzes considering this business has been growing rapidly and are generally operated by coastal communities.

Catfish aquaculture: Catfish farming activities are carried out by coastal communities which represents a change in the business of FCN that considered unprofitable. The return of the FCN business is reinvested in to catfish aquaculture. In addition, there is a change of business groups in FCN to be an individual business on catfish farming. The benefit of FCN which is the return on investment and operating costs derived from Coremap II project divided equally to members. Catfish farming can continuously run because seed catfish can be obtained easily at a low price of IDR 250-300/fish with a selling price of IDR 16,000/kg with a three-month production period. The feed can be obtained from the fish catching in te beach by using drawn nets and trash fish as the fish waste from catching. Business feasibility can be accomplished with R/C ratio of 1.8 with a net profit IDR 1,275,250 million per unit of pond or approximately, IDR 7.5 million for six units of the ponds. Each farmer is able manage fish pond from two to six units (Table 3).

The catfish farmers plan to expand their businesses to achieve economies of scale, especially farmers who manage only two units. The plan is based on the potential sources of feed in the form of trash fish and the head of anchovy at a price of IDR 2500/kg in the off-season of trash fish.

Table 4: Catched fish processing in the district of Central Tapanuli

Description	Seaweed Dodol (IDR)	Catfish cracker (IDR)
Investment	1.771.500	2.230.000
Depriciation	436.000	850.000
Operational cost		
Raw material	293.000	35.000
Other variable cost	33.000	64.300
Total variable cost	326.000	89.300
Value of production	450.000	350.000
Net profit	124.000	250.700
Estimation of production cyclus (tahun)	150	100
R/C ratio	1.36	3.58

Data collection on 2012

Seaweed dodol and catefish cracker: The processing of seaweed dodol and catfish cracker are carried out as a secondary activity for housewives who are fisherme's wives who has a big role as the livelihood for fishery households. The enterprises generate benefits for coastal communities with a value of R/C 1.36 and 1.58, respectively. The average income earned approximately, IDR 1.5-2.5 million of seaweed dodol and IDR 2.5-3.0 million for catfish crackers. The advantages of these businesses are low investment value and can be cultivated in a household or micro scale, so, it is not difficult to start and run the business. In addition, most of the equipment needed is common kitchen equipment owned by the household, so, this business can be easily developed by coastal communities (Table 4).

Both types of processing have increased the value added of fishery products, created employment opportunities, seaweed market and catfish market. Seaweed is generally sold in dried form while catfish is marketed locally in the form of live fish to be consumed as a snack with the marketing area is around Central Tapanuli.

CONCLUSION

The integration of fishery enterprises is the resultant of the business of processing with fishing and aquaculture activities as it creates value added, increased and more stable prices for the each integrated enterprises and conservation of fisheries resources business. The main actors of fishery processing enterprises are the women or the wifes of fishermen. Processing and aquaculture businesses ensure a source of income for fishermen because of the nature of continuous production and the risk relatively small when compared to fishing catch activities. The pattern of these enterprises can also change lifestyle of fishermen community from consumptive behavior to the regular and controllable consumption patterns. The fishermen can also develop planned and controlled fishery enterprises to reduce dependence on the climate and the risk of harsh marine natural rhythm. Development of coastal aquaculture activities should not only be based on fish or beaches on the coast but should also be further developed with agricultural and livestock farming activities that match the coastal ecosystem. This activity may chang the pattern of the extractive livelihood to farming activities. Cultivation and processing can encourage coastal communities to organize business activities that can be controlled, so that, the plan of investment, production and benefit can also be set and improve the well-being of coastal communities.

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