

Community Participation in Development of the Seaweed Processing Industry (Study in Madura Island, East Java Province)

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Abstract. Indonesia is the world's largest seaweed exporter country [1]. However, Indonesia exports raw seaweed higher than processed ones. It makes the export value lower than other countries [2]. Indonesia can increase the export value through increase level participation of the community in seaweed processing. This study aims to analyze the level of community participation in seaweed processing in Indonesia, especially on Madura Island as one of the biggest seaweeds producing regions in Indonesia. The study uses descriptive method. The results show that the level of community participation in seaweed processing is categorized in manipulation level or low level. In order to increase community participation, collaboration of all relevant parties, namely government, academia and the private sector are needed to support the improvement of the community's ability to add value to seaweed.

Keywords: Participation, Development, Processing, Seaweed.

1 Introduction

Indonesia is the biggest seaweed exporter country in the world. However, Indonesia exports raw seaweed higher than processed ones. It makes the export value lower than the other countries [1]. Indonesia can increase the added value and the export value through increase export processed seaweed. There is quite far difference if we compare the price of raw material with processed seaweed. The price of raw materials for exported seaweed is US \$ 0.3/kilogram. But in the form of SRC (semi reined chrrageenan) for 6 US dollars/Kg and become 10 US dollars/Kg in the finished product as chrrageenan powder [2].

The development of seaweed cultivation in Indonesia has changed the social and economic structure of society. The evidences show that there has been a change in the society main livelihoods from catching fisheries to seaweed farming. The society expects a positive implication on the changes for the ecology, especially the sustainability of coastal environments and changes in the behavior of coastal communities that depend on catching fisheries. The field of seaweed cultivation can be an alternative livelihood and can be a support for earning income during a famine season [3].

The community faces problems about how they can enhance the value added of seaweed. They can increase the value of the product by making difersification of seaweed products. So that it can increase the price and income of seaweed farmers. The development of the seaweed industry requires active participation from the community. This research will explore the level of community participation in seaweed processing in Indonesia.

2 Research Methods

2.1 Kind of The Research

This research was conducted on the seaweed cultivating community in Madura Island, East Java Province. Based on the purpose, this study uses descriptive research method. Researchers would like to describe the facts or circumstances or symptoms that appear about community participation in the development of the seaweed industry. Descriptive research is used to describe characteristics of a population or phenomenon being studied [4].

2.2 Data Source and Data Collection

This study used both primary and secondary data. The primary data included the perceptions of respondents related to their participation in seaweed industry. And secondary data include literature review and documents related to community participation in seaweed industries. The respondents used as informan in this research were all seaweed farmers and seaweed processors at Madura Island. The number of respondents obtained were 54. The data were collected by questionnaire and focus group discussion. Tabel 1 shows the questionnaire about active participation of seaweed industry community.

Tabel 1. Questionnaire for Community Participation in the Development of the Seaweed Industry

A. Strengthening Industry and Improving Industrial Performance				
No	Statements	Active	Active enough	Non-Active
1.	My participation in increasing productivity			
2.	Community participation in seaweed management			
3.	Seaweed management that I do when there is an activity or project			
4.	My involvement in seaweed management starts from the beginning to the end of the activity			
B. Diversification of Derivative Products or New Commercial Products				
No	Statements	Active	Active enough	Non-Active
1.	My participation in product development			
2.	My participation in the selection of investors through promotions and offers of cooperation			
C. Increased Human Resources				
No	Statements	Active	Active enough	Non-Active
1.	My participation in improving my quality through education and training			
2.	I increase mastery of technology			
D. Government Policy				

No	Statements	Active	Active enough	Non-Active
1.	My participation in improving the coordination of industrial establishment licensing between the center and the regions			
2.	My participation in drafting technology-intensive policies			
E. Strengthening the Role of Research and Development				
No	Statements	Active	Active enough	Non-Active
1.	My participation in developing new sophisticated technology research			
2.	My participation in adopting and modifying new sophisticated technology			
F. Guaranteed Supply of Raw Materials				
No	Statement	Active	Active enough	Non-Active
1.	My participation in cooperation with institutions related to the management of raw materials			
F. Financing				
No	Statements	Active	Active enough	Non-Active
1.	My contribution in supporting the financing of technology procurement			
2.	My contribution in supporting the financing of research			

The furthermore step are tabulating and calculating based on the following formula, such as:

- Variable score = sum of indicator scores
- Average score = sum of indicator scores: number of respondents
- The real condition of participation rate = average score x number of levels x number of indicators x number of respondents
- Minimum score = number of participation levels + smallest score on ordinal data scale + number of respondents + number of indicators on the variable
- Maximum score = number of levels of participation + largest score + on an ordinal data scale + number of respondents + number of indicators on a variable
- Interval distance = Maximum distance - minimum distance = maximum score minus minimum score
- Compiled range of levels of participation based on the above calculation results are as follows:

Table 2. Level of Participation Formula

No	Level of participation	Score	Interval score (range)
1	Manipulation	Interval range = a	< a
2	Therapy	$a + a = b$	$(a+1) - b$
3	Convey (informing)	$b + a = c$	$(b+1) - c$
4	Consultation	$c + a = d$	$(c+1) - d$
5	Damping (placation)	$d + a = e$	$(d+1) - e$
6	Partnership	$e + a = f$	$(e+1) - f$
7	Delegation	$f + a = g$	$(f+1) - g$
8	Supervision (citizen control)	$g + a = h$	$(g+1) - h$

3 Theoretical Framework

3.1 Community Participation and Participation Level

Participation according to the Big Indonesian Dictionary is about participating in an activity. Meanwhile, participation is the mental and emotional involvement of a person in a group situation that encourages them to stand up to the achievement of the goals of the group's goals and take responsibility for the group.

Community participation is a manifestation in the whole process that requires involvement, both active and passive from a person or group of people including the seaweed industry community in Indonesia in general and in Madura in particular, consciously and voluntarily in their contribution to programs or activities ranging from planning, implementation, and valuation until the utilization stage. The success of the seaweed industry is determined by community participation in realizing the ideals of the Indonesian state, namely the export of processed Indonesian products including processed seaweed.

Community participation is community participation both in the process of identifying problems, as well as the potential that exists around the community. Includes the process of choosing and making a decision, both alternative solutions to deal with the problem, as well as the process of solving the problem, and involvement in evaluating the changes that occur [5].

Participation is an active involvement of the community. The community can also be involved in the process of development policy strategy and determining the direction implemented by the government. Participation is defined as the involvement or active participation of the community in the whole process of activities, as a medium for growth between communities, the community and the government also foster a sense of ownership and responsibility in the planning carried out. Preparation of participatory planning that is in the formulation of planning needed by the local community is done through focus group discussions.

The level of community participation can be explained as follows [6]:

a) Manipulation

At this level community participation is at a very low. Not only are they helpless, but power holders manipulating community participation through a program to get "approval" from the community. Communities are often placed as committees or advisory bodies with the intention of "learning" or to engineer their support. Public participation is made a public relations vehicle by the holder of power. Practices at this level are usually village renewal programs. The public is invited to be involved in the committee or advisory body and its sub-

committees. The power holder manipulates the functions of the committee by "gathering information", "community relations" and "support." By involving the community in the committee, the power holders claim that the program is needed and supported. In fact, this is the main reason for the failure of rural renewal programs in various regions.

b) Therapy

To this degree, the word "therapy" is used to treat illness. Powerlessness is a mental illness. Therapy is done to cure the "disease" of the community. In reality, social ills occur since the distribution of power between race or economic status (rich and poor) is never balanced.

c) Informing

The level of community participation at this stage is a transition between no participation and tokenism. We can see two mixed characteristics. First, providing information about community rights, responsibilities and choices is the first step towards community participation. Second, the provision of this information occurs is only one-way information (of course from government officials to the public). However, there is no feedback from the community. Tools that are often used in one-way communication are mass media, pamphlets, posters, and responses to ask questions.

d) Consultation

Consultation and inviting public opinions is the next step after providing information. Arnstein stated that this step could be a legitimate step towards full participation. However, this two-way communication is still artificial because there is no guarantee that people's attention and ideas will be taken into consideration. The method is usually used in community consultations is a survey of behavior, meetings between neighbors, and hearings. Here participation remains a pseudo ritual. The general public only receives a statistical picture, and participation is an emphasis on how many people come to meetings, take home brochures, or answer a questionnaire.

e) Placation

The stabilization strategy places very few people in community affairs bodies or in government agencies. In general, the majority is still held by the power elite. Thus, the community can be easily defeated in the election or deceived. In other words, they allow the community to provide additional suggestions or plans, but the power holders still have the right to determine the legitimacy or feasibility of the suggestions. There are two levels in which people are pacified: (1) the quality of the technical assistance they have in discussing their priorities; (2) increments in which the community is organized to suppress these priorities.

f) Partnership

At the partnership level, community participation has the power to negotiate with power holders. Bargaining power at this level is an instrument of the power elite and those without power. The two actors agreed to share the responsibility for planning and decision making through a collaborative body, planning committees, and mechanisms for resolving deadlock problems. Some conditions for making partnerships effective are: (1) there is an organized basis of power in the community where the leaders are accountable; (2) when the group has the financial resources to pay its leader, given an incoming fee for their efforts; (3) when the group has the resources to hire and employ their own technicians, lawyers, and managers (community organizer).

g) Delegated Power

At this level, the community holds significant power to determine development programs. To resolve differences, holders of power need to start the bargaining process compared to giving a pressing response.

h) Citizen Control

At this highest level, community participation is at the maximum level. Community oversight in each sector increases. The community requests easily the level of power (or supervision) that guarantees that participants and residents can carry out a program or an institution that will have full power both in terms of policy and and it is possible to negotiate conditions when outsiders can replace them.

The level of community participation according to [7] is divided into 3 parts, i.e:

a) High

The initiative came from the community and was carried out independently starting from the planning, implementation to the maintenance of development results. The community not only participated in formulating the program, but also determined the programs to be implemented.

b) Medium

The community has participated, but in its implementation, it is still dominated by certain groups. The community can voice their aspirations, but they are still limited to daily problems.

c) Low

The community only witnessed project activities carried out by the government. The public can provide input either directly or through the mass media, but only for consideration. The community is still very dependent on funds from other parties so that if the funds stop then stimulant activities will cease as well

The data obtained are calculated based on the following formula:

Variable score = the sum of the indicator scores

Average score = sum of indicator scores: number of respondents

Real conditions of participation rate = average score x number of levels x number of indicators
x number of respondents

Minimum score = number of levels of participation + smallest score on the ordinal data scale
+ number of respondents + number of indicators on the variable

Maximum score = number of levels of participation + largest score + on an ordinal data scale
+ number of respondents + number of indicators on a variable

Interval distance = maximum distance - minimum distance = maximum score minus minimum
score

4 Results and Discussion

4.1 Participation Rate Calculation Results

The community in Madura Island cultivate several kinds of seaweed such as *Gracilaria verrucosa sp*, *Eucheuma spinosum sp*, *Eucheuma cottonii sp*. Table 3 shows results of data calculation about community participation level in producing seaweed at Madura Island.

Table 3. Participation Rate Calculation Results

No	Level of participation	Score	Interval score (range)
1	Manipulation	Interval distance = 14.688	< 14.688
2	Therapy	14.688 + 14.688 = 29.376	14.689 – 29.376
3	Informating	29.376+14.688 = 44.064	29.377 – 44.064
4	Consultation	44.064+14.688 = 58.752	44.065 – 58.752
5	Damping (placation)	58.752+14.688 = 73.440	58.753 – 73.440
6	Partnership	73.440+14.688 = 88.128	73.441 – 88.128
7	Delegation	88.128+14.688 = 102.816	88.129 – 102.816
8	Supervision (citizen control)	102.816+14.688 = 117.504	102.817 – 117.504

Table 4 shows the level of participation in each variable.

Table 4. Partisipation Rate

No	Statement	Value	Participation level
	A. Strengthening Industry and Improving Industrial Performance	3824	Damping
No	Statements		
1.	My participation in increasing productivity		
2.	Community participation in seaweed management		
3.	Seaweed management that I do when there is an activity or project		
4.	My involvement in seaweed management starts from the beginning to the end of the activity		
	B. Diversification of Derivative Products or New Commercial Products	1496	Giving Information
No	Statements		
1.	My participation in product development		
2.	My participation in the selection of investors through promotions and offers of cooperation		
	C. Increased Human Resources	1504	Giving Information
No	Statements		
1.	My participation in improving my quality through education and training		
2.	I increase mastery of technology		
	D. Government Policy	1344	Giving Information
No	Statements		
1.	My participation in improving the coordination of industrial establishment licensing between the center and the regions		
2.	My participation in drafting technology-intensive policies		

	E. Strengthening the Role of Research and Development	1072	Partnership
No	Statements		
1.	My participation in developing new sophisticated technology research		
2.	My participation in adopting and modifying new sophisticated technology		
	F. Guaranteed Supply of Raw Materials	728	Giving Information
No	Statement		
1.	My participation in cooperation with institutions related to the management of raw materials		
	G. Financing	1104	Therapy
No	Statement		
1.	My contribution in supporting the financing of technology procurement		
2.	My contribution in supporting the financing of research		
	Total	11.072	Therapy

4.2 Level of Community Participation in Seaweed Processing

The level of community participation is various in seaweed processing. The community participation in strengthening and improving the performance of the industry is classified as damping level. The damping strategy places very few people in community affairs bodies or in government agencies. In general, the majority is still held by the power elite. Thus, the community can be easily defeated in the election or deceived. In other words, they allow the community to provide additional suggestions or plans, but the power holders still have the right to determine the legitimacy or feasibility of the suggestions. There are two levels in which people such as: (1) the quality of the technical assistance they have in discussing their priorities; (2) increments in which the community is organized to suppress these priorities.

Several indicators of the level of community participation in the development of the seaweed industry is dominant at the level of information delivery. Namely on indicators of diversification of derivative products or new commercial products, improvement of human resources, government policies and guarantees of supply of raw materials. It shows that the level of community participation at this stage is a transition between no participation and tokenism. We can see two mixed characteristics. First, providing information about community rights, responsibilities and choices is the first step towards community participation. Second, the provision of this information occurs is only one-way information (of course from government officials to the public). However, there is no feedback from the community. Tools that are often used in one-way communication are mass media, pamphlets, posters, and responses to ask questions.

The indicators for strengthening the role of research and development, community participation in the development of cutting-edge technology research and adoption and modification of the latest technology show that the community is categorized at partnership level. At the partnership level, community participation has the power to negotiate with power holders. Bargaining power at this level is an instrument of the power elite and those without

power. The two actors agreed to share the responsibility for planning and decision making through a collaborative body, planning committees, and mechanisms for resolving deadlock problems. Some conditions for making partnerships effective are: (1) there is an organized basis of power in the community where the leaders are accountable; (2) when the group has the financial resources to pay its leader, given an incoming fee for their efforts; (3) when the group has the resources to hire and employ their own technicians, lawyers, and managers (community organizer).

In financing, community participation in supporting technology procurement financing and supporting research funding is categorized therapeutic levels. The word "therapy" is used to treat illness. Powerlessness is a mental illness. Therapy is done to cure the "disease" of the community. In reality, social ills occur since the distribution of power between race or economic status (rich and poor) is never balanced.

In general, the level of community participation in seaweed processing is categorized at manipulation level. At this level, the community participation is at a very low level. Not only is it powerless, but power holders manipulate community participation through a program to get "approval" from the community. Communities are often placed as committees or advisory bodies with the intention of "learning" or to engineer their support. Public participation is made a public relations vehicle by the holder of power. Practices at this level are usually village renewal programs. The public is invited to be involved in the committee or advisory body and its sub-committees. The power holder manipulates the functions of the committee by "gathering information", "community relations" and "support." By involving the community in the committee, the power holders claim that the program is needed and supported. In fact, this is the main reason for the failure of rural renewal programs in various regions.

Finally, the community participates is categorized at low category. The community only witnessed project activities carried out by the government. The public can actually provide input to policy makers, but it is still limited to being considered. Considering, input from the public has not been fully followed up by the policy makers, including the desire to develop businesses that are still constrained by facilities, community capacity and capital. In addition, the community is still very dependent on funds from other parties so that if the funds stop, stimulant activities will also cease. This can be seen that the community is still unable to develop seaweed business due to lack of capital.

4.3 Discussion

The community participation in strengthening and improving the performance of the industry is classified as damping level or placation. There are only a few people that participate in increasing productivity and managing the seaweed industry. The community tends to follow the projects of the government or big businessmen, while the authorities control it.

The community participation in diversification of derivative products or new commercial product is classified as giving information. The community is in a transition between not participating and only limited to knowing information about seaweed industry. Considering that the community does not yet appear to make commercial products of high economic value from processed seaweed, given the traditional methods of processing.

The indicators for increases human resources is classified as giving information. Community participation in improving quality through education and training and technology upgrading is in the transition between not participating and only limited to knowing information about knowledge and technology. The community still uses traditional methods in

processing seaweed. This results similar with [3], they said that the mastery of seaweed cultivation and processing technology in Indonesia is inadequate. Hence, it need to enhance human competency and facility to adopt the technology.

The indicators for government policy is classified as giving information. The community is in a transition between not knowing or having little information about the need to develop coordination between the center and the regions in developing seaweed business and technology policies. The community is still using traditional methods in seaweed processing. And they do not know enough about the role of the government in supporting the development of their businesses.

The indicators for strengthening the role of research and development is classified as partnership. The community has the power to negotiate with related parties in developing, adopting and modifying research on the latest technology. Local communities collaborate with many universities and researchers to find out the problem solving. This is an appropriate step in order to enhance the seaweed industry because several solutions about the problems can arise through the researchs.

The indicators for guaranteed supply of raw materials is classified as giving information. The community is also only at the transition stage between not participating or merely a symbol in the management of raw materials. Although the government has provided information about the importance of managing raw materials, the community has not provided satisfactory feedback. This condition can be seen from the handling of raw materials that have not produced high quality products to meet the needs of the seaweed industry. Hence, a quality is a main factor to make a business has competitive advantage. So, they should manage raw material properly if they want to succeed in seaweed industry.

In financing, community participation in supporting technology procurement financing and supporting research funding is categorized therapeutic levels. The community is not yet financially strong enough to overcome the difficulties associated with capital. There still appears to be a gap between the rich and the poor in financial matters. Of the respondents in this study, almost all were in the category of micro and small businesses that have difficulty in accessing capital. This has become one of the obstacles in the development of seaweed industry. Based on private sector, they can access bank or financial institution non bank. However, bank or non bank financial institution has many regulation that rigid and not easy accesable for the micro and small business. Based on government, they can access facilities from government that give micro business credit. Where as, government should support them to enhance their seaweed business. Based on community, they can solve the problem with several alternatives about source of capital such as cooperative. Hence, the community needs to think and discuss about opportunity to build cooperative in order to fulfill financial and non financial need of the seaweed industry.

In general, the level of community participation in seaweed processing is categorized at manipulation level or low category. The community only witnessed project activities carried out by the government. The public can provide input either directly or through the mass media, but only for consideration. The community is still very dependent on funds from other parties so that if the funds stop then stimulant activities will cease as well. Indonesian government conducts several programs on the development of the seaweed industry through the Ministry of Maritime Affairs and Fisheries. This was realized in several programs including KIMBis (Mina Business Clinic) which was initiated in several potential areas for seaweed. The government collaboration is related to several fields including seaweed production and marketing [8][9]. However, the program is still controlled by the government, not yet fully placing the community as the main actor in the seaweed industry.

According to Riniwati, H [10], individual factors are not significant for HR development. However, indirectly significant individual factors on HR development through organizational factors. And significant community factors indirectly through organizational factors towards community empowerment that supports the blue economy. So, community participation can be increased through the involvement of community groups and government organizations.

Based on the result of this study that the community participation is categorized at the lowest level, the government should provide opportunities for the community to gradually explore their ability to participate in seaweed commodity management. Giving an opportunity in this case is not to burden the community with political policies or for interests outside the community. The community should be enhancing their competency and role in order to develop the seaweed industry based on social, economic and ecological aspect.

5 Conclusion

The level of community participation in the development of Indonesia's seaweed industry is still low, namely manipulation. The low level of community participation is determined by various factors that are multi-dimensional. Among them are still a small number of people participating in strengthening and developing the performance of the seaweed industry, still limited to knowing about new products, the low ability of human resources in adopting technological knowledge and innovation, still lack of public support for central and local government policies and new technologies, lack of guaranteed supply of good quality raw materials, and financial difficulties to support the use of appropriate technology and research. And overall, community participation in the development of the seaweed industry is in the low category.

5.1 Suggestion

In order to increase community participation, collaboration of all relevant parties, namely government, academia and the private sector are needed to support the improvement of the community's ability to add value to seaweed.

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