Multi-Stakeholder Collaboration Model in Mangrove Rehabilitation: Case Study in Wedung Village-Wedung District, Demak Regency

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Abstract. Wedung Village, Wedung District of Demak Regency, experienced severe mangrove deforestation caused by the uncontrolled mangrove cutting for shrimp farming in the early of 90's. The unsustainable shrimp farming couldn't last long and causing a severe aquaculture land condition led to a massive collaboration from multi-party to restore the quality of the land. This study aims to determine the pattern of collaboration by multi-parties in conducting mangrove rehabilitation through various techniques, one of them is silvofishery. A case study research method by Yin were used in this study. Our study found that initiation of mangrove rehabilitation from the third party such as Non-governmental Organization (NGO) served as a reformer agent. Silvofishery as an aquaculture method combined with mangrove planting, that promoted by NGO led to short-term income increasing is the most suitable model in the research area. In conclusion, implementation of mangrove rehabilitation from multi-party collaboration with different model contribution such as community assistance, expert supervising, and financial support through silvofishery technique led to an environmental sustainability and increased community income. The sustainability of the silvofishery implementation post initiator assistance, came to be a concern, that need a future exit strategy.

Keywords: Mangrove, Rehabilitation, Stakeholders, Collaboration, Silvofishery.

1 Introduction

Global warming and climate change can already be felt, characterized by rising atmospheric temperatures at higher levels. This condition is usually followed by an increase in rainfall caused by convective activity (an increase in air mass) in the region. Rainfall is one indicator of climate change [1]. There are several major threats to climate change on people's lives, especially the poor, including sources of livelihood, health, food security, and water. Many of them make a living in agriculture or fisheries that are climate dependent [2].

Some areas are very susceptible to climate change, one of them is in the village of Wedung, District of Wedung Demak, Demak Regency. This village has a 339 hectares pond area, with an abrasion area of around 17.91 hectares. The most damaged sub-village affected by abrasion is Gojoyo sub-village, in which almost 46% of people's ponds were damaged [3].

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The results of the participatory identification indicate that the people of Gejoyo sub-village has several vulnerabilities such as, low level education, as 76,14% people of Gejoyo sub-village only finished the education to elementary level; low level environment quality; high number unemployment, as 480 people were unemployed and 220 people were not working; low level income, as the average income of Gejoyo people come around IDR 30.000/day and the lowest expense level around IDR 500.000 [4].

The presence of Non-governmental Organizations (NGOs), namely the Development Resources Development and Assessment Institute (LPPSP) and Mangrove for the Future (MFF), has changed people's life. Some initiatives were built together with the community such as economic improvement, interventions on land use and building community awareness in environmental management through silvofishery.

The choice of using the silvofishery, based on this model is not only an environmental rehabilitation, but also an effort to revive the community's economy. Silvofishery is a traditional technique of aquaculture system that combines fisheries business with mangrove planting, which is followed by the concept of introducing a management system by minimizing inputs and reducing the impact on the environment Macintosh *et al*, [5].

The presence of NGOs in Gojoyo sub-village has become a driving force for mangrove ecosystem rehabilitation efforts as well as economic improvement. The development of silvofishery is carried out with a multi-stakeholder collaboration model, with a participatory approach. This study aims to determine the pattern of collaboration by multi-parties in conducting mangrove rehabilitation through various techniques especially silvofishery.

2 Methods

A case study method was done in this research. As an approach, key case study research makes it possible to investigate a particular event, situation, or social condition and to provide insight into the process that explains how a particular event or situation occurs [6]. Yin [7] defines a case study as a research process. “A case study is an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) within its real-life context, especially when the boundaries between phenomenon and context may not clearly evident”.

A case study method was done during the implementation of silvofishery that initiated by NGOs in Gejoyo sub-village. Case study research consists of detailed investigations, often data collected over specific periods of time, phenomena and contexts whose purpose is to provide an analysis of the contexts and processes related to the theoretical issues being studied. This phenomenon cannot be separated from the context, but it becomes interesting when the goal is to understand the behavior that is influenced by certain content [8].

Data collection methods were taken from documentation, in-depth interviews, and observations of the community leaders, head village and social community in the village. The variable of this research is the application of multi-stakeholder collaboration models in managing silvofishery.

3 Results and Discussion

Stakeholders are individuals, groups of organizations whether male or female who have an interest, involved or influenced (positive or negative) by a development program activity

[9]. The same thing was stated by Scheemer [10] which states that "Stakeholders in a process are actors persons, groups or organizations with a vested interest in the policy being promoted". Whereas Gonsalves et al. cited by Iqbal [11] stakeholders are those who give impact or are affected by the impact of a program, development policy.

The main stakeholder in this research finding is the NGO that initiated the development of silvofishery. Secondary stakeholders are fish farmers, community leaders, youth leaders, women leaders, village heads, and local governments, including the Office of Fisheries and the Regional Development Planning Board of Demak Regency.

The establishment of a multi-stakeholder was developed through: meetings, planning silvofishery development programs, capacity building for stakeholders, socialization, business equipment assistance for women, and silvofishery implementation practices. The step taken was a trial on a 12 hectares community pond area.

The problem found was the rejection of some of the community against the ponds that were used as trials. Most of the pond owners who would have been selected as silvofishery development site projects refuse to make their ponds as demonstration plots. The community felt pessimistic and stated that they refused when their ponds would be used as a silvofishery demonstration plot. This condition is due to a community perception that planting mangroves in the middle of a pond will shallow fast. This is logical because most of the fishponds in the Gojoyo sub-village contain a lot of mud and substrates from upstream areas. Substrate and mud will be easier to settle if there are capture plants planted in the middle of the pond.

This difficulty causes the implementing partner (NGOs) to change its strategy in the selection of land that will be used as a demonstration plot. The strategy that initially encompassed the whole community in general to voluntarily registered their ponds to serve as a demonstration plot turned into a personal approach to members of the farmer group such as *"Karya Tani"* to identify the farm owner who was willing to accept the pilot land trial. This such rejection is caused by low level knowledge of the function of mangroves as spawning ground, nursery ground maintenance area and feeding ground feeding area [12]. The real rejection was the concern over ponds that are considered to be no longer productive during the trial of mangrove planting.

This step is proven to have a fairly high success rate. There are 6 (six) ponds that meet the criteria to be used as demonstration land, ponds owned by H. Jaya Ibadi, H. Abdul Khalim, H. Rahmad, H. Ridwan, H. Mukholid and Masrokan, each covering 2 hectares.

Internal group conflicts were happening in community assistance. The formation of new groups has triggered internal conflicts in community organizations. The group that has been formed before *"Karya Tani"* feels left out, while the new group dominates the activities carried out with the stakeholders. This internal conflict was successfully resolved by NGOs by opening discussion forums attended by various elements of the community.

Another problem that occurs was the community participation in program development. The main difficulty was encouraging community participation because this sub village had low level of accessibility to the resources. Gejoyo sub-village has been isolated from local government intervention since the main road to the sub-village is damaged, education facilities are inadequate, access to health facilities is far, and people are uninterested to change. NGOs build community participation through a variety of strategies, among others, approaches to community leaders, exploring community life together, including building networks with existing business groups, farms, agriculture.

The participation approach developed by this NGO is based on the importance of participation as expressed by Conyers [13], including: first, community participation is a tool to obtain information about the conditions, needs, and attitudes of the local community,

without the presence of development programs and projects will fail; second, the community will trust the project or development program more if they feel involved in the preparation and planning process, because they will know more about the ins and outs of the project and will have a sense of ownership of the project; third, it is a democratic right if people are involved in the development of their own society.

Fig. 1. Silvofishery project in a pond.

The three problems mentioned above can be overcome by participatory approach. Through this approach a multi-stakeholder forum has been successfully developed at the sub-village, village and district levels. The multi-stakeholder participation of each forum is the key that able to encourage all parties to succeed in developing silvofishery.

Some factors that influence the success of community participation including: (1) The functioning of the multi-stakeholder forum when NGO assistance takes place, (2) The movement of community leaders who support the implementation of silvofishery, followed by the reopening of social barriers that have been clogged and closed; (3) The presence of Higher Education Field Work *"KKN"*, nature lovers groups, mountaineering clubs, mangrove plantation movement by schools, community (4) Health services initiated by NGOs in collaboration with the Faculty of Medicine, Sultan Agung Islamic University of Semarang; (5) Demak Regency Fisheries Service Project which was implemented at the Gejoyo sub-village; (6) Village regulations initiated by NGOs to protect mangrove areas; (7) various initiatives developed by the village government and the Demak Regency Government.

This study makes three important assumptions in that aspect: firstly, all members of a partnership were making contributions which can be represented in monetary terms; secondly, stakeholders derived a return from the collaborative effort which can also be measured that way. Thirdly, all partners calculated their individual net-benefit by measuring up their contributions against their benefits and were driven by the objective to maximize this value.

The analysis of voluntary collaboration has offered an important messages of partnership design, such as: (1) A simple coordination to provide public commodities (silvofishery) that not automatically create more problems; (2) Stakeholders have had benefits from contributing in the conjunction effort. Partnership between parties and multi-stakeholder had attract stakeholders to realize the benefits of partnership [14]; (3) A repeated interaction has reduce freedom when the main actors tried to consider the reputation. Meanwhile, institutional adjustment, such as refund for project that has not been suitable to resolve the problems. This should be explored as a mechanism to solve the problems and making partnership more effective. In order to making a successful approach, they need to observe and evaluate the behavior of the stakeholders.

A partnership is a strategic interaction between rational interests, social order and politic, personal relationship between stakeholders, individual and organization culture, and founders' motive. All of them form a conflicting oddity of a simple economic analysis. This model can be shown in the picture below:

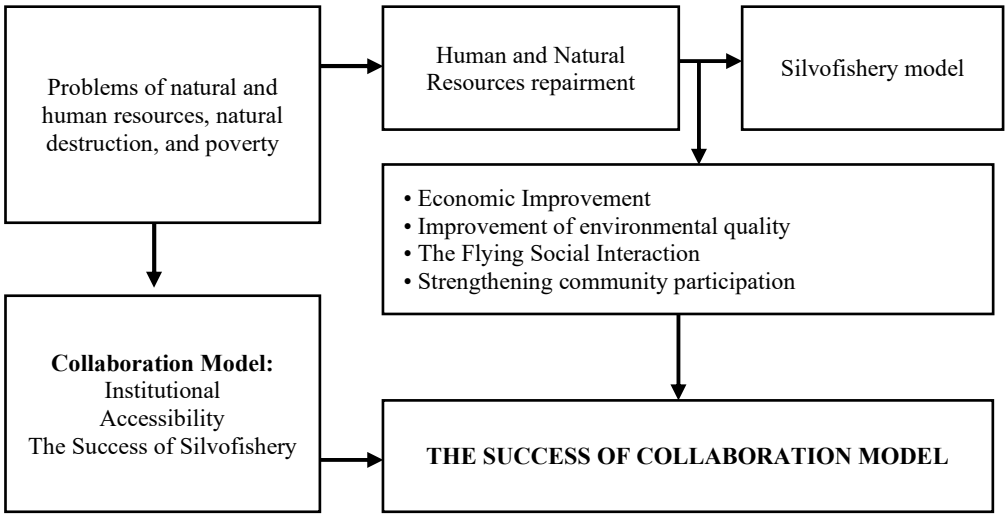

Fig. 2. Model of partnership in this research.

This multi-stakeholder collaboration model was successfully implemented. NGOs have taken strategic steps to implement a model for solving problems. This success is measured by: (1) community accessibility to resources is increasingly open; (2) institutions in the community have strengthened; and (3) the continuation of the silvofishery trial is replicated by the Demak Regency Fisheries and Maritime Agency.

The multi-stakeholder role can be accounted for. The success of NGO work can be seen in the sub village. Access road to the Sub Village has begun to be built, although it is still not felt as expected, but at least the road can be passed by motorcycle. The location of the mangrove used as a tourist attraction offered to the public is supported by community traditions even in the management of ponds such as sea alms.

Even though the multi-stakeholder collaboration model was successful, it still left problems. After the last NGO (LPPSP) completed its work for two years, several multi-stakeholder roles began to fade. The presence of new NGOs carrying new programs to continue the LPPSP program has revived community empowerment. The main key is in the community, they need to improve their self so they can achieve their aims.

4 Conclusions

From this study we may conclude that:

a) The multi-stakeholder collaboration model can be carried out with the conditions that all parties have the will to change the situation. Stakeholders must realize that the partnership that is built is for the common good.

b) The most effective approach in community empowerment in handling silvofishery is multi-stakeholder participation. Participation can be achieved if it meets the requirements: the community understands, is able to behave in accordance with the expected movement, and has the ability to act. The main requirement that must be met is that the community understands the intentions and objectives of the initiations that are built and developed. Community participation will be more easily mobilized if the model adopted has a positive microeconomic impact, in the form of increased incomes
c) The development of networks between stakeholders must not stop in one project event or stop when the initiator or companion is retired. The network must be developed so that the initial steps that have been set can continue.

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