



Community-Based Mangrove Management: The Relationship between Perhutani and Cultivators in Muara Gembong, Bekasi Regency, West Java Province

Maya Ambinari^{a*}, Dudung Darusman^b, Hadi S. Alikodra^c, Nyoto Santoso^d

^a Forest Management Science, Faculty of Forestry, Bogor Agriculture University, Indonesia

^b Forest Management Department, Faculty of Forestry, Bogor Agriculture University, Indonesia

^{c,d} Tropical Biodiversity Conservation Department, Faculty of Forestry, Bogor Agriculture University, Indonesia

^a Email: mambinari@yahoo.com

^b Email: ddarusman@yahoo.com

^c Email: halikodra.ha@gmail.com

^d Email: ns.bagindo@yahoo.co.id

Abstract

Mangrove ecosystem sustainability is determined by the success of the relationship between the parties relating to its management. But it turns out in practice often arise various problems referred to as the Principal-Agent problem. The purpose of this study was to determine the problems that occur in the relationship between Perum Perhutani (principal) with Cultivators (Agent) in mangrove management in state-owned land in Muara Gembong, Bekasi Regency, and West Java Province that continues to be degraded and deforested. This research is a qualitative research with 15 key informants who connected with mangrove forest management in Muara Gembong. The results showed that Perum Perhutani with the Cultivators have reached an agreement in mangrove management as outlined in the Cooperation Agreement in Planting, Maintenance, Protection and Utilization of Mangrove Forest, which contains the rights and obligations of both parties in the management of mangroves, as well as prohibitions and sanctions for violating the agreement.

* Corresponding author.

E-mail address: mambinari@yahoo.com.

Still mangrove forest damage caused partly due to the Principal Agent problem such as the adverse selection, asymmetric information, contract design, moral hazard, lack of incentives, and lack of control. To solve the principal agent problem in Muara Gembong, it should be prepared a better contract in order to bring the interests of both parties, increasing the number of Territorial Police (Polter) in the field, create an incentive structure that encourages Cultivators to obey the Cooperation Agreement, improve counseling and supervision to the Cultivators.

Keywords: community based management; mangrove management; muara gembong

1. Introduction

Mangrove forests in Muara Gembong also called Ujung Krawang located on the north coast Bekasi Regency, West Java Province with an area of 10.481.15 hectares, which consists of an area of 5.170 ha of production forests and protected forest area of 5.311.15 ha. Condition of mangrove forests in Muara Gembong continue to experience degradation and deforestation due to encroachment and land conversion. Most have been turned into ponds, residential, agricultural and other uses. As a result, it happens rob, sea water intrusion, abrasion, and reduced fishery product.

Mangrove forests in Muara Gembong managed by Perum Perhutani which is a State-Owned Enterprises. Perum Perhutani in managing the state forest located in Central Java, East Java, West Java and Banten except forest conservation based on the principles of sustainable forest management and the principles of good corporate governance. Protected forests in Muara Gembong be transferred to Perum Perhutani since 1978 in a state already experiencing degradation and deforestation due to the ongoing conflict with the community. In order to overcome these conflict, Perum Perhutani trying to involve communities in forest management activities through a programme named *Pengelolaan Hutan Bersama Masyarakat (PHBM)* or the Community Based Forest Management (CBFM). By applying the PHBM system, the economic aspects, social and ecological expected to be achieved. This is consistent with the statement by [1] that Community Based Mangrove Management (CBMM) or Community Based Mangrove Management is the most suitable alternative for sustainable management of mangrove forests are ecologically important. Furthermore [1] also stated that community-based mangrove management has been driven by academics and government agencies as an alternative in sustainable mangrove management. Community participation in forest management is facilitated through a contract between Perum Perhutani with Cultivators. It is a form of a principal-agent relationship where Perum Perhutani act as Principal which delegates part of mangrove forest management authority to cultivators as agent. According to [2], the agency relationship is a contract in which one or more persons (principal) assigns another person (the agent) to do most of the principal and delegating some authority in decision making. The relationship, according to [3] and based on the three assumptions : (1) human nature selfish (self interest), have limited rationality (bounded rationality), and do not like risk (risk aversion), (2) the existence of a conflict between members of the organization, productivity and their efficiency assessed from asymmetric information between principal and agent, and (3) information which is seen as a commodity to be traded.

Although it has been involving the community through PHBM program, mangrove forests in Muara Gembong

is still largely in the form of aquaculture with mangrove cover approximately 6% . Under these conditions, research on principal-agent relationships in mangrove management that involves the community is very important. On the one hand, many community-based resource management meet with success; but on the other hand, the management is also facing challenges to sustainability and resource management. This study is expected to provide inputs for the various parties related to management decision making, so that mangroves resources can be managed sustainably.

2. Methods

The experiment was conducted from April to October 2014 in mangrove areas that are in production forests and protected forests managed by Perum Perhutani. The location is located in Muara Gembong, the northern part of the District of Bekasi, covers 10,481.15 ha . Muara Gembong is about 50 km from the capital city of Bekasi district and is approximately 225 km from Bandung, capital of West Java province.

This study is a qualitative research supported by quantitative data. Data collection was done by in-depth interviews with 15 key informants who connected with mangrove forest management in Muara Gembong, field observations, and analysis of documents related to mangrove management at the sites. Collected data were analyzed descriptively about the problems that arise between principal and agent.

3. Results and Discussion

3.1. Mangrove Management History

In 1949, the government purchased land area of 9.311 hectares on the northern coast of Bekasi Regency, so that the land which was originally a private land turn into state land status. According [4], the purpose of the land purchase are: (1) protect the estuari of Citarum River and Bekasi River and surrounding marshes; (2) prevent abrasion by the waves; (3) hold the sea breeze towards the mainland; and (4) provide fuel for the residents of Jakarta and surrounding areas. In 1954, the government declares the area as forest area with a total area of 10,481.15 ha

After changing the status of private land into state land, the right business previously owned community becomes void. However, changes in land status lead to disputes, because people do not recognize it. To overcome this, the government gives the public new rights such as the right to claim through local transmigration program in the mangrove forest area of 3,000 ha. Local transmigration participants not only local people but also immigrants from Ancol, Tangerang, Banten, Cirebon and Indramayu The author in [5] noted that the claim rights in fact temporary, is not the same as ownership rights; but people think of it as the property giving rise to new conflicts between the government and the community of cultivators.

In 1963, the Minister of Agriculture and Agrarian issued a letter to the Head of the Directorate of Agricultural, Head Plantation, and the Head of the Forestry Division stating that the estate lands, forestry and other land controlled by the state and the people have tilled agricultural land will be used hereinafter to be distributed to the people who work on it. As a result of the publication of the letter, Reference [4] said that there is encroachment

of mangrove forests in Muara Gembong by society so that some areas turned into residential, fields, and ponds.

Forestry Bureau handed over the management of the region to Perum Perhutani in 1978. Perum Perhutani itself has not implement optimal management of these areas indicated by the increasing number of settlers and extensive mangrove areas that change function. This continues so in 2014, in which the remaining mangrove stands only about 6.51% of the total area, or approximately 605.50 hectares. In 1985, Perum Perhutani and regent of Bekasi publishes the Joint Decree (SKB) which aims to preserve and secure the reforesting mangrove and mangrove forests covering an area of 5,700 ha in stages as well as provide an opportunity for communities to manage forests with the fishing patterns and rice (Silvofishery). According to [6], the rights granted to the public remains in the form of the right to work on but it is accompanied by obligations to cultivators to set aside part of his land to be planted with mangrove with a ratio of 80% for the mangrove trees and 20% for aquaculture. This policy is considered to be less successful because during the 15 years since the event launched was only successful mangrove planting area of 281.8 ha. Perum Perhutani then apply the new policy, which cultivators tied with the Cooperation Agreement in Planting, Maintenance, Protection and Utilization of Forest Land which also regulates the imposition Compensation Forest Area (GRPKH) to cultivators. Compensation is intended as a form of recognition cultivators on land owned by Perum Perhutani is working on and is compensated use of forests for activities Silvofishery [7].

In 2002, the Regent of Bekasi apply to the Minister of Forestry on forest land use in Muara Gembong to developed the New Town named Pantai Makmur which is the industrial estate, warehousing, residential, ports, tourism, trade, and services [4]. As the result, Ministry of Forestry declare Protected Forest Muara Gembong of ± 5.170 ha changed its function into Production Forest. Until now the process of changing the function of the region has not continued since Bekasi Local Government has not followed up by providing another area in lieu of the forest will be converted.

3.2. Principal-Agent Relationship between Perhutani and Cultivators

Perum Perhutani as a state owned Enterprises that is entrusted with the responsibility to administer mangrove forests in Muara Gembong perform management involving forest villagers with a system of Collaborative Forest Management named PHBM. The aims of PHBM are to 1) enhance corporate responsibility, forest village communities and stakeholders concerning the sustainability of the functions and benefits of forest resources; 2) Enhancing the role of the company, the community forest village and interested parties on the management of forest resources; 3) Expanding access to rural forest communities in forest resource management; 4) harmonize forest resource management activities in accordance with the regional development activities according to the conditions and the social dynamics of forest villagers; 5) Improve the productive efforts towards independent forest village communities that support the creation of sustainable forest [6]. PHBM implementation in Muara Gembong can be seen in Table 1.

Perum Perhutani implement CBFM in Muara Gembong adapt to local conditions, where large areas of forest have been encroached upon and transformed into aquaculture areas. To get recognition from the community that the area is state forest as well as to enhance the functionality and sustainability of forest resources, Perum

Perhutani make an agreement with the cultivators as outlined in the Cooperation Agreement in Planting, Maintenance, Protection and Utilization of Forest Land. Refers to [2], the position Perhutani as principal and the cultivators as agent. The rights and obligations of both parties are presented in Table 2.

Table 1: Implementation of PHBM in Muara Gembong in 2014

Sub District	Village	Area (ha)	Community Agencies	Membership (persons)
Muara Gembong	Pantai Bahagia	1.351,25	Mina Bahagia	25
	Pantai Mekar	762,50	Rimba Lestari	25
	Pantai Sederhana	330,00	Sederhana Lestari	14
Pondok Tengah	Huripjaya	1238,8	Wana Kahuripan	20
	Jayasakti	565,83	Mandiri Jaya	27
	Pantai Harapan Jaya	2685,57	Harapan Jaya	20
	Pantai Mekar	228,7	-	-
Singkil	Pantai Bahagia	688,75	Bahagia	25
	Pantai Bakti	2629,75	Mina Bakti	25

Source: Perum Perhutani

Table 2: The rights and obligations between Perum Perhutani (principal) and cultivators (agent)

Position	Rights	Obligations
Perhutani (<i>principal</i>)	<ul style="list-style-type: none"> a. Determine how planting and maintenance of forest plants or brackish aquaculture will be applied so as not to disturb the plant brackish. b. Together Cultivators determine the width of the trench, rabak and fish species. c. If the forest plants in locations always fails then entitled to share the land rest from cultivation for a certain period without liability for compensation. d. Unilaterally terminate and revoke licenses if both parties are working on malpractice and defiance of the law without being tied with all the costs and investments made. e. Can be partially or completely stop when the share of arable land will be used by the Perum Perhutani 	<ul style="list-style-type: none"> a. Cultivators for giving permission to carry out aquaculture in ponds trench. b. Contributes to the broad and specific category. c. Guide and nurture directly or through KTH (Forest Farmer Group) technical or non-technical terms. d. Supervise, direct and control the implementation of fisheries activities conducted trench pattern pond agent and KTH

Position	Rights	Obligations
	<ul style="list-style-type: none"> f. Inserting or removing water into the pond if deemed necessary. g. To combat pests and plant mechanically or chemically. h. Setting a share locations with vast arable or certain categories i. GRPKH receive payment of the Cultivators Rp 50,400 / ha / year. 	
Cultivators (agent)	<ul style="list-style-type: none"> a. Eligible for the management and ownership of the result of cultivation in the contribution agreement, unless the tree is owned by Perum Perhutani b. Receive stake claim to a certain extent and categories. 	<ul style="list-style-type: none"> a. Together or individually in the re-planting executing its share of dead plants, eradicate pests and to avoid treatment which may cause the death of the tree and its implementation should comply with Perum Perhutani. Prevent and provide reports in the event of disruption and damage to the stand and assist officers in carrying out security Perhutani, maintenance and protection of forests. b. Prevent / prohibits any party to install bamboo or other objects that may impede the smooth flow of water c. Pay GRPKH as compensation to the principal amounting to Rp 50,400 / ha / year. GRPKH pay by way of deposited through collection officer appointed principal and recorded in a control card GRPKH initialed officer. d. Pay GRPKH the payment period from January to September of the current year. e. Also active in Brackish KTH. f. Know the rules of forest protection. g. Also maintaining the integrity of the forest boundary markers, plot boundaries, and boundaries share. h. Marketing of fishery products to the fish auction place and or local cooperatives.

Based on studies conducted by [8], the principal-agent problems that occur in relation Perhutani and cultivators include several things, namely :

- Adverse Selection

Perum Perhutani not have the opportunity to choose cultivators that will be included in land management, but the selection is an important step that determines the success of the implementation of the agreement that has been agreed. This is because most of the land has been encroached upon by the community. Cooperation agreement made by Perum Perhutani is an attempt to solve the encroachment problem. As a result of the absence of the selection of cultivators, most of the cultivators who signed a cooperation agreement with Perum Perhutani is the owners of capital who came from outside Muara Gembong; while actually working in the field are locals.

- Contractual relationship

A contract made by Perum Perhutani contains rights and obligations of both parties as outlined in GRPKH or the Cooperation Agreement in Planting, Cultivation, Maintenance, Protection and Utilization of Forest Land. Perum Perhutani has compiled such a contract design which is dominated by the obligations that must be implemented by the cultivators in the hope that achieve the desired goal by Perum Perhutani. These obligations are intended to limit the area of land cultivated and control the damage and rehabilitate damaged mangrove forests. Contractual relationship between Perum Perhutani and the cultivators were not going well because a lot of things in the Cooperation Agreement are not adhered to.

- Moral hazard

Cooperation agreement made between Perum Perhutani with agents that largely is not a native of Muara Gembong, but the owners of capital from other areas of knowledge about the conditions in Muara Gembong and functions of mangrove forests is very limited. This resulted in the decisions taken in regard to the business of considering the pond just in terms of profit without thinking about its impact on the sustainability of mangrove forests and the environment in Muara Gembong. While the cultivators who work in the field are paid by the owners of capital so that only carry out orders of the owners of capital. Various clause in the Cooperation Agreement cannot run well, such as the obligation to undertake maintenance activities like replanting mangrove plants if the plants die and the obligation to eradicate the pest. In fact, because of the limited knowledge of the owners of capital on the functions of mangroves, there were uprooted mangrove plants in ponds because they thought would reduce the production of shrimp. These conditions resulted in mangrove forests continue to be damaged so environmental conditions also declined.

- Lack of incentives

The incentives contained in the agreement is only an extension of the agreement. If cultivators have to obey the rules and regulations of Perum Perhutani, the cultivators are entitled to extended the rights to cultivate the land. The absence of incentives for cultivators who have carried out their obligations, resulting in absence of

encouragement for cultivators to comply with the agreement contained in the Cooperation Agreement, as soon not re-planting mangrove plants that die or eradicate pests that attack mangrove.

- Gaps information

Information gap that occurs between Perum Perhutani with cultivators has resulted Cooperation Agreement did not go well. Cultivators receiving information from other parties such as village officials and land speculators regarding their development plans Muara Gembong to be an industrial area and the port so that the price of land will be very expensive so not concentrate on taking care of ponds. As a result, a lot of agreement in the Cooperation Agreement is not implemented.

- Controls

The control exercised by Perum Perhutani against the cultivators pond in the field carried out by the Territorial Police (Polter). Polter number in BKPH Ujung Krawang today is 6 people to oversee the forest area of 10,481.15 ha or on average every Polter has a working area for the supervised area of 1,746.86 ha. Polter task to control a vast area is very heavy so the results are not optimal. According to the results of interviews with Perhutani, Polter activity today is more geared to keeping the forest area which conditions are still good enough in order not to be damaged. As a result, the condition of the damaged forest area is getting worse due to lack of supervision. Chairman of the Community Agencies in Hurip Jaya village also stated that the need for increased control by Perum Perhutani to increase the number of Polter that mangrove destruction is not increased. Disobedience to the Cooperation Agreement lot going on, especially in the case of mangrove plant maintenance. For this type of offense as Polter only persuasive action to help cultivators directly in the field to improve the condition of mangrove. No other sanctions were firmer as administrative sanctions in the form of a reprimand especially legal sanctions. The new legal actions carried out for cultivators who have violated the law as certification of land in the area and clearing of mangrove plants.

3.3. Sustainability Management to Support Mangrove Ecosystem

Mangrove forests in Muara Gembong which is located adjacent to the capital city of Jakarta in the beginning has been designated as a protected area to support the city both in terms of ecological, economical and social.

Various repair system of cooperation between Perum Perhutani as principal and as agent cultivators is not yet able to reduce the rate of degradation and deforestation. The main cause is a conflict of interest between Perum Perhutani and cultivators because mismatches land management objectives. Perum Perhutani aims to maintain the sustainability of mangrove, while cultivators trying to get the maximum profit from his pond effort to break the agreement that has been agreed upon. This is consistent with the statement Keil (2004) which mentions the existence of differences of interest which resulted agent exhibit opportunistic behavior to benefit as much as possible which is not in line with the objectives of the principal.

The problems that arise in the relationship between Perhutani with cultivators resulted in mangrove management becomes not run optimally, while community involvement in mangrove management is essential to support the objectives of the management of Perum Perhutani. Reference [7] stated that community-based mangrove

management can preserve the function of conservation and provide economic benefits to the company and the community itself. This is in line with the opinion of [10] that mangrove supports a variety of functions such as a local fishery, provide habitat for breeding fish, and aquatic productivity that supports a wider and commercial fisheries, also provide valuable ecosystem services to coastal communities including coastal soil stabilization and protection against storms.

Community participation will determine the success of sustainable mangrove management activities. According to [12] participation in decision making, followed by participation in forest conservation and economic benefits are important factors that affect participation in forest management program, where gender, household size, sources of income, land tenure, and technical assistance also affects participation, Reference [13] showed that people in Sundarbans, Bangladesh were given the role to participate in managing the mangrove is more enthusiastic in carrying out conservation activities. In his study in the same location, Reference [14] showed that mangrove granting ownership rights to the community to encourage participation and management of mangrove. Another study by [15] in France and Denmark also showed landowners who managed to conserve awarded in the form of a contract offer with the value determined by success in conserving and maintaining the ecological functions of the forest. Reference [16] states that the implementation of the policy in Kien Giang, Vietnam which require land managers to preserve and maintain 70% of its land to remain serve as mangrove forests and the remaining 30% for farms and paddy fields can motivate the participation of the community to manage mangrove and created a lot of field work for the community.

Agreement between Perum Perhutani as principal and cultivators as agent should be able to accommodate the interests of both; so that community-based mangrove management in Muara Gembong can find success. This success can support the sustainability of the surrounding area, especially where urban areas such as Jakarta. Of course the above mangrove management also needs to involve various stakeholders, not just Perum Perhutani and cultivators only. Reference [17] argue when applying participatory process, stakeholder participation should be considered from the beginning, from concept development and planning, through implementation, monitoring and evaluation of results; where the involvement of stakeholders as early as possible in decision-making is crucial if expecting a participatory process successfully and last long. In her research in Lampung, Reference [18] found that the involvement of the parties in achieving the common goal of mangrove forest management depend on the implementation of the tasks and functions of the three parties working together, namely: local government, communities and universities; where the appearance of a potential conflict caused by the same interests must be negotiated between the parties together to reach an agreement. According [19] the success or failure of the management of community-based natural resources in Malawi and Botswana, can be judged from the results of the project and policy documents, the success rate of sustainable environmental management, provide income especially for the poor and learning institutions in various levels.

3.4. Conclusion

Conditions of mangrove forests in Muara Gembong not grow well in the presence of PHBM. Principal Agent relationships between Perum Perhutani to Cultivators in PHBM set forth in the Cooperation Agreement in Planting, Maintenance, Protection and Utilization of Forest Land. There are several problems that resulted

Principal Agent mangrove management performance did not go well. These problems is the selection of the agent, the contractual relationship, moral hazard, information gaps, lack of incentives and controls.

In order for mangrove management can work well to do repairs on the Principal Agent problems. The difference between the interest of Perhutani as principal with cultivators as agent can be overcome by preparing a better contract in order to bring the interests of both parties. So that cultivators continue to perform its obligations is necessary to increase the control of Perum Perhutani primarily by increasing the number of Polter in the field. In addition to create an incentive structure that encourages Cultivators to obey the Cooperation Agreement, improve counseling and supervision to the Cultivators.

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