The Analyze of Collaborative Management Perspective of Petungkriyono Forest

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Abstract. Forest Ecosystem has a significant role in assuring food security and sovereignty as well as national defense and security. Sustainable forest management is an effective framework to reduce and to add fuel to the impact of Green Houses Gas (GHG) emission changes. Petungkriyono is one of the last tropical forests in Java and provides biodiversity including rare flora and fauna. This area stores outstanding biodiversity that must be maintained, managed utilized to give meaning to humanity. The objective of this study is to analyze how a collaborative management perspective implemented in Petungkriyono as alternative policies that can be recommended to the government. This research shows that a collaborative management perspective significant factor to obtain sustainable development. Further application collaborative management approach recommended with the support of the government on the policy, rules, and human resource development. Through co-management, it was expected to improve the understanding of what people wanted, helped people to identify the issues, arranged the completion priority, increased commitment, social awareness independence. The collaboration between the private sector, local government, and community empowerment a particularly important factor in the success of sustainability management.

Keywords. Collaborative management perspective, Petungkriyono forest, Sustainable forest management

1. INTRODUCTION

According to the topography in Java Island, 92% of the surface of Java Island on 1000 above sea level, 7% are 1000-2000 above sea level, and about 0.7% are on ≥2000 above sea level; where all of them are active or non-active volcano mountains [10]. One of the forest areas, having high biodiversity and becoming the last protection for the ecosystem in Java Island, is the Petungkriyono forest. The vast of the Petungriyono forest is 5388.7 Ha and ±1300 above sea level, including the lower mountain forest. Geographically, it is located in the south

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of Pekalongan regency and abuts on Dieng Mountain. Administratively, the Petungkriyono forest has a status of protected forest and limited production forest, managed by Forest Management Unit of Perhutani KPH of East Pekalongan. To find the most appropriate policy that can be implemented to conserve the balance of the ecosystem in the Petungkriyono forest, one of the efforts is to understand the analysis of collaborative management perspective.

Sustainable forest management contributes positively to climate change mitigation and adaptation. Rehabilitation of degraded forests and lands will increase the capacity of the forest to absorb and store carbon which ultimately improves the resilience of forest ecosystems against climate change [2]. One of the challenges faced by policymakers is how to assess the value of natural resources comprehensively. In this case, it is not only the market value of goods produced by forest ecosystems but also the service of it [5].

The collaboration between the private sector, local government, and community empowerment a particularly important factor in the success of sustainability management. Environmental education can encourage active involvement and greater public participation. Management's decision to include local input will be more successful and gain greater political support.

One of the participations and partnership in the environmental approach was known as collaborative management or co-management. The defined co-management as the real power-sharing between local managers and government so each side could control the deviation that would be done by other sides. While, co-management could be defined as responsibility-sharing between related parties, such as government, society to manage resources, the environment. Furthermore, the implementation of co-management could be gradual/ varied from informing to until the society could control all of the management as community control [9]. Co-management was a pluralist approach to manage the natural resources by multi-stakeholders in variation role to reach the purpose of environmental conservation, sustainable utilization of natural resources and a fair share of advantages and responsibility between some leveling/stratifications of co-management.

Co-management was based on participation approach and partnership that focused on 3 things, i.e.: (1) Social justice, (2) Sustainable utilization of natural resources (3) Implementation of the local people initiative. The implementation level of co-management was started from consensus searching until responsibility [3].

The objective of this study is to analyze how a collaborative management perspective implemented in Petungkriyono as alternative policies that can be recommended to the government.

2. METHODOLOGY

Study Area

The research was done in the forest area, Petungkriyono District, Pekalongan Regency, which was divided into 9 Sub-Districts. This study is located at 7°08'30" S -109°44'39" E in the Petungkriyono Forest, Pekalongan Regency, Central Java, Indonesia (figure 1). The forest cover of Petungkriyono is about 73.2% (5347.5 Ha) from its total land 7358 Ha.

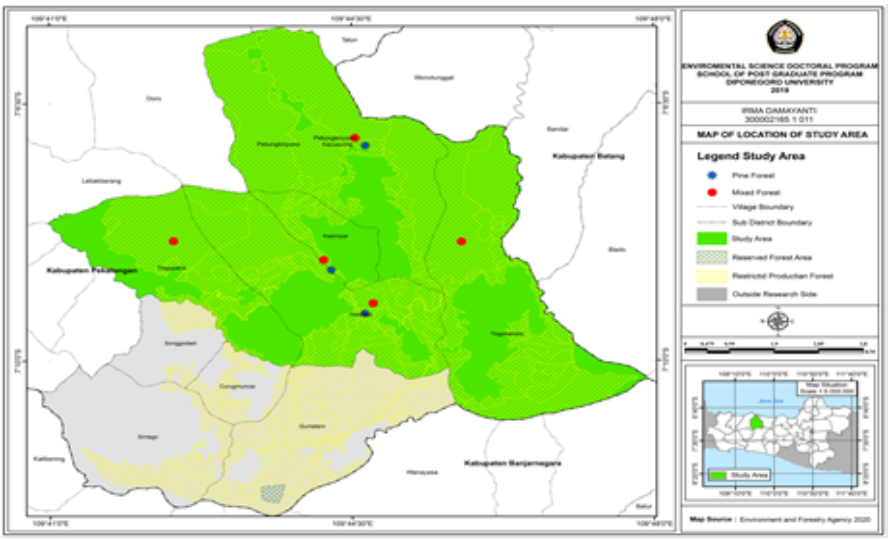

Figure 1. Study site at the Petungkriyono forest.

This research focused on Petungkriyono Sub District, at Pekalongan Regency Central Java Province. The Petungkriyono forest has dominated some stand of vegetation with high diversity consist of 29.1% Pine forest (Limited Production Forest - HPT), 54.6% reserved forest (Protected Forest or Mixed Forest - RBC), 10.7% Puspa stand and 5.6% unproductive area (figure 2).

Figure 2. (a) The Mixed forest of Petungkriyono, (b) Pine Forest of Petungkriyono

There are two aspects influenced as follows to act for something or doing the action and to observe the activity impact. The action can be an idea or concept that a group or community was done. For minimizing the lack of measurement, 4 steps that needed to do i.e.: First is, arranging the indicators that were in detail and measured quantitatively, second is doing the measurement of stakeholder's perception before and after the stimulus. The third is doing the comparison study between sampling activities to compare and understand some factors that

affected to collaborative management. Fourth is doing quantitative analysis as a basis of a justification measurement result.

The working hypothesis that was submitted on this research, First is co-management application was affected by stakeholder participation, area of vegetation cover economic benefits; second the factor of good pre-condition, good condition mechanism.

3. RESULT AND DISCUSSION

Collaborative Management Perspective

While applying the co-management to resolve the environmental problems, it needed to be done holistically by giving priority to the principles of togetherness, sharing, and trust. Mitchell (1997 and 2000) stated that togetherness and equality were important principles of co-management, along with togetherness and equality. When they came along together, it was expected to exist sharing and participation.

Collaborative management (co-management) as a partnership- based approach was developed as a response to the weaknesses of previous approaches, such as state-based and community-based in environmental management. On the two of the first approach (state-based), the most basic weaknesses were a lack of social participation, and the community-based approach was the factors of ability and funding became the main obstacle [8].

This participation was an important element in environmental management because of participation would guarantee program sustainability. As stated above Collaborative Management Perspective, the approaches of environmental management in Petungkriyono there were some fours conditioned to be concerned about depth used i.e figure 3:

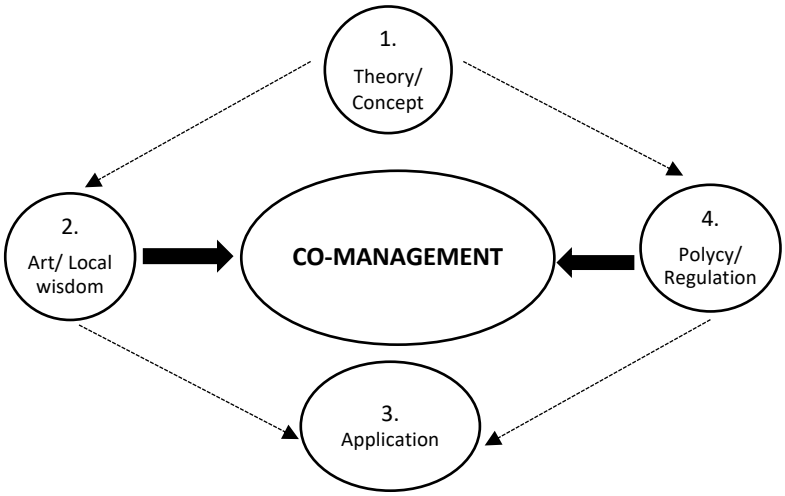

Figure 3. Perspective of Co-Management [1]

According to Theory/ Concept perspective of Co-management, the existing condition of Petungkriyono forest management is still not optimal yet by applying the Sustainable Development Goals System (SDGs), which is the forest area that is in de facto in a form of the natural forest but in de jure it is a limited production of 105 forest area and few of protected forest area. So, while it happens the tree loggings and the transfer of forest status becomes cultivate an area of potato farming that affects the decreasing quality of the forest. It cannot be proceeded legally due to its designation.

According to Regulation Aspect that has been done by Local Government, in Petungkriyono management is still focus on increasing the locally-generated revenue (*Pendapatan Asli Daerah* – PAD) through eco-tourism aspect and improvement of facilities and infrastructure, and they don't count the aspect of environmental sustainability for next-generation yet. So, it needs the judicial review about the regulation of Petungkriyono forest management by integrating the climate change adaptation into the development planning.

According to Arts/Local wisdom, people in Petungkriyono has the local wisdom to manage the forest, so it can stand until it now becomes the only natural forest in Java Island. If we review from the local wisdom aspect, where people keep enjoy the natural condition for what it is and maintained for the next generation affected the development as efforts to increase the welfare of farmers and people around the forest. The development has changed people's thought that lives in the forest and they are influenced by people outside their community. The negative impact is when local wisdom has been influenced by an outside culture so it changes people's mindset, from a natural lifestyle, becomes a metropolitan lifestyle around the forest to fulfill their needs. It causes damage forest ecosystem and it is more difficult to control.

Through the approach of a collaboration management application in the management of Petungkriyono natural forest, by holding three main principles of collaboration management, such as togetherness or equality, sharing, and trust. It is needed to bring a positive effect on people to take care of their forests to be sustainable. Some factors that are influenced by the application of co-management in the Petungkriyono forest, i.e.: Good pre-condition, Good condition mechanism, Right space dimension, Local people's steadiness Human factor.

Management of Petungkriyono forest nowadays still does not give priority to the synergy between bottom-up and top-down, as can be seen in the table below:

Table 1. Existing vs Expected Condition

Explanation	**Existing Conditions**	**Expected Conditions**	**Issues**	**Solution**
Strategy	The management system of the State Forest Area was controlled by *Perhutani* as a unit of forestry in Java	Local Government with the non-governmental an organization can take a role in the State Forest Area management.	A binding legal rule and the loss of authority for forest management in Regency/ City.	Management of forest area by collaboration pattern and share roles.
Structure	Organization as manager of the forest area has different authorities	Special management that covers various parties, such as Perhutani and society.	The weaknesses of synergy/ alignment between stakeholders.	The formation of semi-autonomous institutions as manager in the forest area.
System	- The weak supervision forest area.	- More effective control to prevent the deforestation and land	- The extent of the area to be addressed.	Judicial review of status changes of forest

	- The upgrade status of forest area still uses old pattern and still no revision for new regulations.	degradation. - Need the status changes secondary forest area on the production forest becomes primary natural forest in a form conserved area.	- The status changes to forest area needs longer process because it needs political willingness from central government	area.
Shared Values	- The development of forest areas put forward the result management. - The role of surrounding people still marginalized.	The expanding of utilization of environmental services. - The increasing of community roles in forest security and management.	- The existence of production target that needs to be reached by company (*Perhutani*). - Still, numerous natural potencies are not found yet.	The development of natural laboratory
Style	A bureaucratic leadership A style that still put forward the budget-based activities and according to the order of their leaders.	The innovation of A leadership style that is out of the box and visionary.	- Concerns over legal issues. - The existence of loyal doctrine to the leaders so the innovation that will be done according to leaders' agreement.	The application of the right man in the right place through fit and the proper test for civil servants that will occupy the position.
Staff	Lack of forest officers. - Limited human resources that handle technically	- Forest officers in each KRPH. - The increasing of functional technical officers.	The moratorium of civil servant admission.	Procurement of outsourcing officers in the forest and forest officers.
Skill	1. Low quality of human resources around the forest.	1. Empowerment of people around the forest. 2. Effective forum of	1. Limited social accompaniment and empowerment.	Appointment of outsourcing officers

2. Low coordination between stakeholders	forest management by community. 3. Increasing the quality and quantity of the apparatus.	2. Conflict of interest between stakeholders. 3. A moratorium of civil servant admission.	and technical training for apparatus

The problem mapping was done to identify some issues that became the cause of not yet optimal forest area management in Petungkriyono. Based on the result of issues identification so the formulation of the issues was:

a. **Regional Management Model**.
   1) The forest area management model that was not right yet.
   2) The community engagement was still not optimal yet.
   3) PHBM pattern that was not yet synergies to develop the forest area.

b. Leadership.
   1) Weak supervision of protection and security in the forest area.
   2) Less of firmness in handling illegal hunting, land occupation illegal logging.
   3) Lack of performance of the area manager apparatus to manage the tenure conflict.

c. Human Resources
   1) Low human resources around the forest area.
   2) Not functioning Forest Village Community Organization.
   3) The low economic level of people around the forest area.
   4) Lack of information access, facilities, and infrastructures around the forest area.

d. **Intersectoral**
   1) Lack of coordination for forest management activities.
   2) Lack of stakeholder roles in handling the cases that happened to protect forest and nature conservation.
   3) Lack of a shared program that involves all stakeholders for forest management.

e. Area Status
   1) The monopoly of forest tenure by *Perhutani*.
   2) The existence of authority transfer rules in the forestry sector.
   3) Forest area status in a form of limited production forest.

From those problem's mapping, it could be concluded to describe the main problem used three indicators according to Rachel Porter and Adam Mansky 2010. Those three parameters were used as material to score the problems that needed to be solved (priority). Description of that three parameters (urgency, growth, and relevance) and their indicators and scores could be seen in Table 2.

Table 2. Description of main problem indicators

Parameter	Concept Definition	Operational Definition			
		Indicator	1	2	3
Urgency	The criticality level of a problem	Regulation	No regulation yet	Regulation without guidance	Regulation with guidance
Growth	Increased scope and policy scale	Leverage	Could not push the growth of other sectors	Could push the growth of other sectors	Could push the growth > than 1 sector
Relevance	The accordance with the main tasks	The accordance level to the main tasks	Relevance with one sector of the main task	Relevance with more than one main tasks	Relevance with all sectors of main tasks

An element of the main problem's priority according to the matrix of problem's strength analysis lack of forest protection, conservation utilization of natural forest potency in the Petungkriyono forest area (Table.3)

Table 3. Matrix of Problem's Strenght Analysis

No	Elements of Main Problems	Urgency			Growth	Relevance	Total Score
		Regulation	Interest	Effect			
1	Leadership	1	2	2	2	2	9
2	Management Model	2	3	3	3	3	14
3	Community	2	2	2	2	2	10
4	Intersectoral	2	3	2	2	2	11
5	Area Status	1	2	1	1	1	6

Priority strata of problem-solving determined by the method as follow:

Highest value = Σ Indicator x Highest weight = 5 x 3 = 14

Lowest value = Σ Indicator x 1 = 6 x 1 = 6

Range = $\frac{\text{Range}}{\text{Class}}$ = 8/3 = 2.7

Priority Strata:

Priority III: 6 – 8.7

Priority II: 8.8 – 11.5

Priority I: 11,6-14,3

Along with the statement of Jensen and Nielsen (1997), Feyerabend (2000) also stated that people and the government's willingness to apply co-management was related to each side's perspective. From the governmental side, environmental management would be done according to a partnership deal with other parties (to avoid conflict) if it happened one more condition below:

1. Active commitment and collaboration of each side were needed the environmental management;
2. Access to the environment was needed to guarantee the life sustainability of one or more sides;
3. Local actors had a historical legal right to the environment;
4. Local interests strongly carried effect to the decision of environmental management;
5. System of environmental management today did not result in the expected condition and either fulfill the needs of local actors;
6. All parties were ready to collaborate.

People's point of view that had access privileges to the environment tended to follow the agreement of co-management if following conditions happen: First, the power of nonlocal actors to push their access environmental management without regard to traditional rules, and 2) Environmental management practices were categorized as not sustainable environmental management. Second, Co-management tried to accommodate the interest of various parties who had interests in the environment. On the principle, the basic of co-management application was authority and advantage sharing. Practically, all steps that were started from initiative until the benefit distribution was important to be put forward of the responsibility sharing between stakeholders and active community.

Environmental management by the community in Petungkriyono nowadays still uses Bottom-Up Community Principle, which is by share profit mechanism between the landowners and the cultivators. But this condition often creates internal conflict in society. By the approach of collaboration management, it is expected to minimize the obstacles and other issues so it will guarantee the preservation of the natural forest. The benefits of collaborative management are:

1. Increase the knowledge and understanding between stakeholders.
2. Increase the trust between stakeholders.
3. Convince the stakeholders to collaborates.
4. Develop the capacity of stakeholders.
5. Create a communication network and mechanism of activities.
6. Do the benefit share.

By the Co-management approach, to resolve the gaps between government (top-down) and community (bottom-up), it is done the incorporation between Central/ Area Government with the wishes of the local community. So, it will accommodate community aspiration to increase the prosperity of Petungkriyono people. One of the participations and partnership in the environmental approach was known as co-management. Pinkerton (1993) defined co-management as the real power-sharing between local managers and government so each side could control the deviation that would be done by other sides. Co-management could be defined as responsibility-sharing between related parties, such as government, society to manage resources or environment, furthermore, implementation of co-management could be gradual/ varied from informing to the society until the society could control all of the management as community control, between those two elements, there were some leveling/stratifications of co-management, started from consultation to partnership [9]. There were two (2) things that became co-management applications.

First, pre-condition that showed the environmental damages in a certain location or environmental conflict. Second, there was a guarantee that hope and benefit of the parties involved could be accommodated [6].

According to Mitchell (2000), co-management needed some condition that was a precondition of co-management success, those preconditions were shown in Table 4.

Table 4. Indicators of Co-Management Element according to Mitchell 2000

No	Element	Indicators of Co-Management Success Precondition
1	Good precondition	a. A critical environmental condition that was understood by all. b. The environmental damage that disturbed the community. c. The environmental conflict that needed to be solved soon. d. Stakeholders' willingness to cooperate.
2	Good condition and mechanism	a. Formal agreement and had the power of law for long term interest. b. The mechanism that was possibly got the advantages by the local community. c. The mechanism that allowed conservation and increasing of local community socio-cultural system. d. Real support from the outsiders; i.e.: company, self-help an institution (LSM), colleges others.
3	The right dimension of space	a. Pilot area coverage was not too wide, so the identification and appreciation of the issue could be done by the participant. b. The number of participants not too big, so it could be built effective communication. c. Governmental democracy was not too big but had clear authority
4	Local society steadiness	a. The involved groups were solid. b. Participants had similar perceptions and interests coverage area. c. Participants had sponsored to mobilize the resources. d. The involved groups were depended on surrounding natural resources
5	Human factor	a. Individual/ group that had the dedication. b. A Fighting spirit to be involved in this program. c. A healthy relationship between government and society. d. Trust between participants

Besides those elements, co-management applications would be influenced by the condition of sociocultural and politics happened in a certain country and community. For example, during the reign of old order the government's role was strongly dominant, co-management was not effective to be applied. The succeeded cases of co-management applications in other countries indicated that there was equality of roles and mutual trust growth between government, community business world. The application of co-management was mean as a willingness to empower local society, self-supporting, independent social justice. Through co-management, it was expected to improve the understanding of what people wanted, helped people to identify the issues, arranged the completion priority, increased commitment, social awareness and independent, decreased dependency and actualized the empowerment on the community involvement [4].

The study was concluded that the co-management approach in Petungkriyono here were alternatives to forest management that needed to achieve by using, i.e.: First, Socio Culture created natural forest as National Park with the concept of National Heritage. Second, Techno Forestry created the area of natural forest as a natural Laboratory of climate change. Third, Ecotourism, created natural forest as eco-tourism area, for both mass tourism and educational tourism. Fourth, Branding or as an icon of Pekalongan Regency by a unique characteristic of Javanese flora fauna in natural forest.

4. CONCLUSION

This research shows that a collaborative management perspective significant factor to obtain sustainable development. Further application collaborative management approach recommended with the support of the government on the policy, rules, and human resource development. The application of co-management at Petungkriyono as a willingness to empower local society, self-supporting, independent social justice. Through co-management, it was expected to improve the understanding of what people wanted, helped people to identify the issues, arranged the completion priority, increased commitment, social awareness independence. The collaboration between the private sector, local government, and community empowerment a particularly important factor in the success of sustainability management.

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