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Stakeholders Mapping of Utilization of Mangrove Forest: Case of Mangrove Utilization as Raw Material for Charcoal by Community in Batu Ampar, Kubu Raya District, West Kalimantan Province

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Abstract

The utilization of mangrove forests as raw material of charcoal by the community in Batu Ampar Sub-District, Kubu Raya District, West Kalimantan has been going on for a long time, in traditional and hereditary. However, this activity is indicated as one of the main causes of the destruction of mangrove forests in this region. PP 6/2007 provides opportunities utilization of mangrove forest by legal and in accordance with the concept of sustainable development. Stakeholders as a part of the institution of mangrove forest management have an important role in achieving the objectives of sustainable utilization of mangrove forests.

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This study aims to identified, mapped and described the role of stakeholders in the utilization of mangrove forests as a raw material for charcoal by community. The results showed there were 24 stakeholders that should be involved in the utilization of mangrove forests as raw material for charcoal by community in Batu Ampar. Stakeholders who act as key players consist of the Ministry of Environment and Forestry; KKMTN; BPKH; BPPHP; Provincial Forestry Agency; Plantation Forestry and Mining Agency; and cooperatives or local financial institution.

Keywords: Mangrove forest; mangrove charcoal; stakeholders mapping; community.

1. Introduction

The mangrove forests in the world in the year 2000 were approximately 137,760 km^2 and 22.6% of this area are in Indonesia [5]. While the mangrove areas in Indonesia based on data from Geospatial Information Agency in the year 2009 is 3,244,018.46 ha [4]. One area in Indonesia which have mangrove ecosystems distribution fairly broad are in Kubu Raya District, West Kalimantan Province. Based on data from the Agency of Plantation, Forestry and Mining in 2012, the area of mangrove forests in Kubu Raya District was around 99,532.90 ha. They also showed that from this area, the most extensive mangrove forest destruction there is in Batu Ampar Sub-District, where an area of 2,265 ha in a heavily damaged, 561 ha in lightly damaged and 18,787 ha in low productivity.

The utilization of mangrove forests by community in Batu Ampar Sub-District was began around 1906. The history shows that this utilization ever got the legality from the Local Government Council of Pontianak (Dewan Pemerintah Daerah Pontianak) in the form of ownership license of Charcoal Kiln and Forest Management since 1949. The forest area that was given the permit was in around Batu Ampar (Limau River until Sukamaju and Panjang Island) [10]. Then the status of this area was changed became Protected Forest based on Forest Land Use Consensus (Tata Guna Hutan Kesepakatan/TGHK) in 1982. After that process, the utilization of mangrove forests as raw material for charcoal by community in Batu Ampar Sub-District was classified as illegal because they did not obtain the utilization permit. The high demand for raw material that was needed in charcoal production caused this activity is regarded as one of the main causes of the destruction of mangrove forests in Kubu Raya [6]. Then the Government through PP No. 6 Year 2007 *jo* PP No. 3 Year 2008 gave opportunity to community for mangrove forest resource utilization legally and can be carried out in accordance with the concept of sustainable development.

These utilizations in form Community Plantation Forest (Hutan Tanaman Rakyat/HTR), Community Forestry (Hutan Kemasyarakatan/HKm), Village Forest (Hutan Desa/HD) and or Partnership Forest (Hutan Kemitraan) schemes. Stakeholders as a part of the institutional management of these schemes are important to be identified to map the role of each stakeholder in order to achieve the goal of mangrove forest management as raw material for charcoal in line with the concept of sustainable development. This study aims to identify, map and describe the role of each stakeholder who involved in the utilization of mangrove forests as raw material for charcoal by community in Batu Ampar Sub-District.

2. Methodology

2.1. Location and Time

The research took place in Batu Ampar Sub-District, Kubu Raya District, West Kalimantan Province, Indonesia (Figure 1). The research was conducted in January – July 2015.

Figure 1: Research Location

Mangrove ecosystems are scattered in Batu Ampar Sub-District consists of four functions of management area, namely Protected Forest (Hutan Lindung/HL), Production Forest (Hutan Produksi/HP), Limited Production Forest (Hutan Produksi Terbatas/HPT), Convertible Production Forest (Hutan Produksi Konversi/HPK) and other land use (Areal Penggunaan Lain/APL).

HL is a forest estate with the main function of protecting life-supporting system for hydrology, preventing floods, controlling erosion, preventing sea water intrusion, and maintaining soil fertility. HP is forest estate with the main function of generating forest products. HPT namely forest estate with the main function of generating forest products via selective/limited logging scheme. HPK is a forest estate with the main function of generating forest products but spatially reserved for use of development other than forestry activity. While APL is non-forest area that can be used for other purposes [14].

2.2. Data Collection

Data was collected through interviews with a number of key informants. Selection of key informants as a source of data in this research is conducted through snowball sampling technique, in which the initial informant is derived from Plantation, Forestry and Mining Agency and Regional Development Planning Agency.

Primary data consists of information about the activities of exploitation of mangrove forests and mangrove charcoal production. Secondary data consists of tasks, functions and authority; community socio-economic data; the history of utilization of mangrove forests, and some other information which were obtained from the literature search and review of relevant documents.

2.3. Data Analysis

Data were analyzed using qualitative stakeholders analysis techniques [1,11,13]. Qualitative analysis of stakeholders are used to describe the stakeholders involved in the sustainable management of mangrove forests, interest and influence of each stakeholder and to explain the role of each stakeholder in supporting the objectives achievement of sustainable utilization of mangrove forest as raw material for charcoal. The authors in reference [13] suggest four categories of stakeholders namely:

1) **subject**, the stakeholders who have high interest but low influence;
2) **key players**, the stakeholders who have high interest in and influence.;
3) **context setter**, the stakeholders who have low interest but highly influential; and
4) **crowd**, the stakeholders who have little interest in or influence.

Further analysis of the participation of stakeholders using a matrix approach to map the role of each stakeholder in the utilization of mangrove forests as raw material for charcoal by community.

3. Result and Discussion

3.1. Overview of Utilization Management of Mangrove Forest in Batu Ampar Sub-District

3.1.1. Mangrove Forest Conditions

According to reference [6], the Sub-District of Batu Ampar has an area of ± 200,270 ha (28.67% of the total area of Kubu Raya District). Mangrove forests in this region covering an area of 61,001.60 ha (30.46% of the area of Batu Ampar Sub-District). Based on the status and the area function, the largest percentage of mangrove distribution is in the HL area (Table 1).

Table 1: Mangrove distribution in Batu Ampar Sub-District based on the status and the area function

Area Classification	Area (ha)	Percentage (%)
Protected Forest (Hutan Lindung/HL)	35,057.37	57.47
Production Forest (Hutan Produksi/HP)	1,118.47	1.83
Limited Production Forest (Hutan Produksi Terbatas/HPT)	13,008.72	21.33
Convertible Production Forest (Hutan Produksi Konversi/HPK)	5,260.52	8.62
Other land use (Areal Penggunaan Lain/APL)	6,556.52	10.75
TOTAL	61,001.60	100.00

Source: Plantation, Forestry and Mining Agency of Kubu Raya District, 2012.

From 61,001.60 ha of above mangrove area, the condition of mangrove forest destruction in Batu Ampar Sub-District had reached 35.43%; consist of 3.71% are in a damaged condition, 0.92% in slightly damaged, and 30.80% in low productivity [6].

3.1.2. Mangrove Wood Utilization as Raw Material for Charcoal by the Community

Utilization of mangrove forests as a source of raw material for charcoal has long been applied in Indonesia. This utilization are managed either by private company or by community. Mangrove charcoal production activities by community are located in East Aceh District, Langkat District, Batam District, Bengkalis District, and Kubu Raya District. This activity contributes to the community's economy. The production of charcoal is allocated to meet the needs of the local market and export [15]. Charcoal which is produced from mangrove wood types have a very good quality so worth exports mainly to Japan and Taiwan at a price of US $ 1,000 per 10 tons [20]. Now the price of mangrove charcoal from farmers in Batu Ampar is around Rp 2,500 – Rp 3,000 per kg.

The practice of mangrove utilization as raw material for charcoal by community in Batu Ampar Sub-District is located in Batu Ampar Village, one of fifteen villages in this sub-district. The history of mangrove charcoal making activities by the community in this village have long done through the traditional production process. Between the 1970s and 1980s, the amount of charcoal kiln in Batu Ampar Village was 30 units. This number increased to 100 units in 1987 [3] and 264 units of charcoal kiln in 2013 [6]. Currently the amount of charcoal kiln that operates in Batu Ampar Sub-District reach over than 400 units based on the data of Village Government. One unit of charcoal kiln requires raw material of mangrove wood about 12 m^3 for once production process. While the charcoal kiln can operate 5 times in a year. Therefore, the mangrove exploitation to supply raw material for charcoal is indicated as the main causes of the destruction of mangrove forests in Batu Ampar Sub-District and surrounding areas. So that the utilization of mangrove forest by community in Batu Ampar need a solution through scheme of community-based management (HTR, HKm, HD, and or Partnership Forest) and involve stakeholders in its management.

3.2. Stakeholders Identification

The authors in reference [2] defines stakeholders as "any individual, group or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same". The [19] define stakeholders as "any group or individual who affected by or can affect the achievement of an organization's objectives". While some prefer to define stakeholders as those who have a stake, claim or vested interest, in which they provide something of importance to the organization and expect something in return [9]. The stakeholders in utilization of mangrove as raw material for charcoal by community are all parties, both individuals and groups who have an interest and are affected and/or affect decision-making as well as the achievement of the goals of sustainable mangrove forest management.

The result of content analysis of information which was obtained from documents and interview with key informants shows that there are 24 stakeholders who involved in the utilization of mangrove forests as raw material for charcoal by community in Batu Ampar Sub-District, namely:

1. Ministry of Environment and Forestry;
2. National Level Mangrove Working Group (Kelompok Kerja Mangrove Tingkat Nasional/KKMTN);

3. Regional Office of the Forestry Planning Agency (Balai Pemantapan Kawasan Hutan/BPKH) of Region III;
4. Agency for Monitoring and Production Forest Utilization (BPPHP) of Region X;
5. Provincial Forestry Agency;
6. Watershed Management Office (Balai Pengelolaan Daerah Aliran Sungai/BPDAS) of Kapuas;
7. Plantation Forestry and Mining Agency (Dinas Perkebunan, Kehutanan dan Pertambangan);
8. Forest Research and Development Agency (FORDA);
9. Regional Development Planning Agency (Badan Perencanaan Pembangunan Daerah/BAPPEDA);
10. Environment Agency (Badan Lingkungan Hidup/BLH);
11. District/Regional House Representatives (Dewan Perwakilan Rakyat Daerah/DPRD);
12. Management Agency for Marine and Coastal Resources (BPSPL) of Pontianak
13. Marine and Fisheries Agency
14. Extension Executive Agency of Agriculture, Fisheries and Forestry (Badan Penyuluhan Pertanian Perikanan dan Kehutanan/BP4K);
15. forestry policy;
16. private companies (PT. Kandelia Alam and PT. BIOS);
17. college/university;
18. Non-Government Organizations or NGOs;
19. cooperative or local financial institution,
20. sub-district government;
21. village government;
22. community figure;
23. resource user community or charcoal farmers; and
24. resource owner community.

Table 2: Stakeholders grouping based on the main tasks

No.	Aspect	Stakeholders
1	Determination and Stabilization	Ministry of Environment and Forestry; BPKH.
2	Spatial Planning	BPKH; BPPHP; BPDAS; Provincial Forestry Agency; Plantation, Forestry and Mining Agency; BAPPEDA.
3	Implementation	BPPHP; KKMTN; Provincial Forestry Agency; Plantation, Forestry and Mining Agency; Extension Executive Agency of Agricultural, Fisheries and Forestry; Cooperation; Forestry Police; Resource User Community; Resource Own Community, Private Company.
4	Development	KKMTN; Plantation, Forestry and Mining Agency; BP4K; FORDA; NGOs; College; the Village Government; Community Figure.
5	Supervision	BPPHP; BPDAS; DPRD; BLH; the Village Government, Community Figure; Forestry Policy; BPSPL; Marine and Fisheries Agency.

Based on analysis of the main tasks, these stakeholders can be divided into five aspects in the management of mangrove utilization, namely: determination and stabilization; spatial planning; implementation; development; and supervision (Table 2).

3.3. Stakeholders Mapping

Based on the importance and influence, stakeholders in the sustainable management of mangrove forests as raw material for charcoal by community in Batu Ampar Sub-District can be mapped into four categories, namely: subject, key players, context setter and crowd (Figure 2).

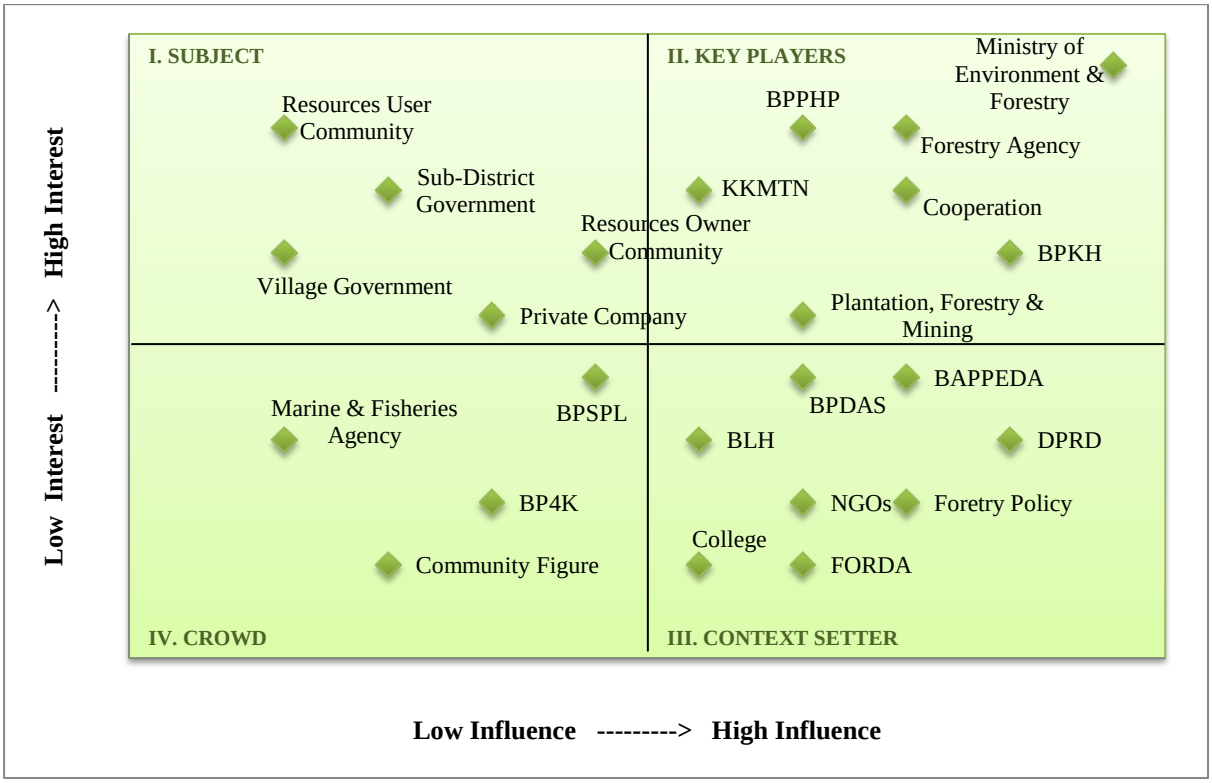

Figure 2: Interest and influence matrix of stakeholders in the utilization of mangrove forests as raw material for charcoal in Batu Ampar Sub-District

Stakeholders in Quadrant I (subject) consist of 5 stakeholders, namely: resource user community or charcoal farmers; private company; the sub-district government; the village government; and resource owner community. These stakeholders will require special initiatives if its interests must be protected [17]. Charcoal Farmers may collaborate with PT. Kandelia Alam as a company which hold business permits for timber forest product exploitation in natural forest (Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Alam/IUPHHK-HA) in scheme of Forestry Partnership (Kemitraan Kehutanan). Charcoal Farmers has interest which is higher than a company because of the dependence of farmers on mangrove forests as a source of raw material for their charcoal production. On the other hand, the company is considered to have a higher influence than the charcoal farmers because the company has IUPHHK and allow to cooperation with the community in order to empower the community.

The low influence of charcoal farmers in decision making on the utilization activities was due to the low capacity of them, especially in financial terms, skills and knowledge. While the village government has a high importance to the improvement of community welfare, but on the other hand they have low influence in regulating the activities of charcoal farmers. The authors in reference [9] state that those who have a high interest but low influence still has responsibility for the implementation of the activities, although they are not directly involved in decision-making. According to authors in reference [13], these stakeholders have low capacity in achieving goals, but can be influential when forming alliances with other stakeholders. These stakeholders can often be very helpful so that relationships with these stakeholders should be kept well.

Stakeholders in the Quadrant II (key player) consist of 7 stakeholders, namely: the Ministry of Environment and Forestry; KKMTN; BPKH; BPPHP; Provincial Forestry Agency; Plantation Forestry and Mining Agency; and cooperatives or local financial institution. These stakeholders show the various parties who should act as the executor of the project/activity or in partnership with one another in mangrove utilization as raw material for charcoal in Batu Ampar. These stakeholders must be actively involved fully included in the evaluation of new strategies [13].

In the Quadrant III (context setter), consist of 8, namely: BPDAS; BAPPEDA; DPRD; BLH; Forestry Policy; NGOs; FORDA; and College. These stakeholders may be a source of the real risk, so that they require monitoring and management. According to authors in reference [13], these stakeholders may bring a risk so that its presence should be monitored and managed properly. These stakeholders may turn out to be key players because of an event. Good relationships with these stakeholders need to be fostered continuously. Therefore all information which is required should still be given so that they can continue to play an active role in achieving the goals.

While in Quadrant IV (crowd) consist of 4 stakeholders, namely: BPSPL; Marine and Fisheries Agency; BP4K; and community figure. These stakeholders have not been the subject of activities or management of resource use, but require little monitoring or evaluation although with low priority. The authors in reference [9] explained that the stakeholders in this position need to be monitored to ensure that their interests are not adversely affect or cause a change in the situation. The involvement of these stakeholders requires a little consideration to involve them because their interest and influence usually change over time. Monitoring and good communications with these stakeholders should remain be established.

3.4. The Role of Stakeholders

The management of mangrove forest utilization include planning, implementation, monitoring and evaluation. The stakeholders need a clear understanding of their respective roles. This study defines the roles for all stakeholders who were involved in the utilization of mangrove as raw material for charcoal by the community based on the main tasks, functions and responsibilities. The role of each stakeholder is described in the five levels of participation, adapted and modified from [12, 16], namely: inform, consult, involve, partnership, and control (Table 3).

Table 3: Stakeholders Participation Matrix for the sustainable utilization of mangrove forests as raw material for charcoal by community in Batu Ampar

STAGE	LEVEL OF PARTISIPATION				
	Inform	Consult	Involve	Partnership	Control
PLANNING	KKMTN; Foretry Agency; BPKH; BPSPL; BAPPEDA; BLH; Marine and Fisheries Agency.	Ministry of Environment and Forestry ; BPKH; BPPHP; BPDAS.	Provincial Forestry Agency; BAPPEDA; Plantation, Forestry and Mining; resource user community.	Resource owner community; company; NGOs.	BPPHP; Provincial Forestry Agency, NGOs.
IMPLEMEN-TATION	KKMTN; Provincial Forestry Agency; FORDA; College; Village Government; Community Figure; BP4K.	Ministry of Environment and Forestry; BPPHP; Provincial Forestry Agency.	Provincial Forestry Agency; resource user community.	Resource owner community; company; cooperation; NGOs.	Provincial Forestry Agency; Sub-District Government; NGOs; Forestry Policy.
MONITORING & EVALUATION	BPPHP; KKMTN; BPDAS; Sub-District Government; FORDA; Colleges; BPSPL.	Ministry of Environment and Forestry; Provincial Forestry Agency; Plantation, Forestry and Mining.	KKMTN; Foretsry Agency; BPPHP; BLH; Foretsry Policy.	College; FORDA; NGOs; Village Government	DPRD; BPSPL; Marine and Fisheries NGOs.

Sources: Adapted and modified from [12] and [16].

Based on Table 3 above, the level "inform" involve more stakeholders. These stakeholders have interest where their program can be affected/affect the existence of mangrove in Batu Ampar, either directly or indirectly. The authors in reference [21] state that through the disclosure of information, one stakeholder can understand the requirements and the situation of other interests that will increase communication and coordination. Similarly, the number of stakeholders who participated on level of "consult" are more than stakeholders who are involved at the level of "control".

These all are useful to keep the synergy of the programs and activities of each stakeholders and keep in order to avoid overlapping policies in the field.

4. Conclusions

There are 24 stakeholders who involved in the utilization of mangrove forests as raw material for charcoal in Batu Ampar Sub-District. Stakeholders who role as a key player consists of: the Ministry of Environment and Forestry; KKMTN; BPKH; BPPHP; Provincial Forestry Agency; Plantation Forestry and Mining Agency; and cooperative or local financial institution.

Phase of implementation of utilization program of mangrove forests as raw material for charcoal involve a lot of more stakeholders who participated at the level of "inform" and "consult" to keep the synergy of program and activities of stakeholders and also prevent overlapping policies.

5. Recommendations

The stakeholders should give a truly effective performance and coordinate integrated management continuously. Furthermore, these need the advanced participatory mapping to describe the relationship between each stakeholder for every scheme of utilizations (HTR, HKm, HD, and Hutan Kemitraan) as a part of solutions to avoid damage of mangrove forest more widespread in Batu Ampar.

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