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Development and Empowerment of Peatland Ecosystem (Analysis of the Peat Ecosystem Recovery and Development Program in the Districts of Kutai Kartanegara and East Kutai, East Kalimantan Province)

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Abstract

The province of East Kalimantan has significant peatlands. Covering an area of 700,000 HA, spread across Kutai Kartanegara Regency, East Kutai Regency and West Kutai Regency. This valuable asset must be empowered to be efficient for the life of the surrounding ecosystem. Swamp and freshwater fish habitat that is around peatlands is a natural potential that has historically been of economic value, which is a condition to be developed on the basis of an empowerment model. The people who live around the swamp and peat have traditionally made swamps and fish their main livelihoods. It is appropriate that the empowerment of peat ecosystems is one of the targets and strategic development agenda, with the support of recommendations from the results of scientific and professional studies.

Analysis of the study that began in the period April - November 2016 on the program of recovery and development of peat ecosystems, is one of the innovations to control the damage to peat ecosystems in order to provide solutions and new hopes for peat ecosystem recovery with the target of achieving sustainable prosperity. In 2019 the results of the analysis of this study have been verified and considered as a periodic monitoring and evaluation tool.

Analysis of the study was conducted in a participatory manner with the Participatory Rural Appraisal (PRA) principle. A number of analytical tools used by the process of finding data include the formation of a Peat Ecosystem Recovery and Control Work Team (TK-PPEG), preparation of a peat ecosystem-based social map, transect walk, and preparation of program options which are then packaged in the form of a Community Work Plan (RKM). The recommended forms of strategic programs include stabilizing water status on peatlands by building canal blocking and developing agricultural demonstration plots or fish cultivation.

The method of collecting data and information is done through observation, interviews and focused discussion or what is commonly called a focus group discussion (FGD). The data generated from the PRA tool is then analyzed descriptively to illustrate the strategies and programs that are the solution in the efforts to restore and control the peat ecosystem. A critical note is that the management of the

peatland hydrological area for agricultural and fishery commodities, must pay attention to their suitability for their utilization and use space. Another aspect is the optimization of community participation in each stage.

Keywords: *Strategy; Recovery; Peat; East Kalimantan*

Introduction

Peatlands in East Kalimantan Province have specific characteristics and characteristics because they are in the interior, far from the coast or in the freshwater swamp zone. Peatlands in East Kalimantan Province with an area of 700 thousand hectares, mostly scattered in the areas of Kutai Kartanegara Regency, East Kutai Regency and West Kutai Regency. Swamps in peatlands in this region are freshwater fish habitats that have strategic economic value and have been hereditary as the main livelihoods of the surrounding communities.

Peatlands with a wealth of ecosystems must be empowered because it has provided benefits to all elements of the ecosystem consisting of humans, plants, animals, soil, water and the surrounding air. All these elements are an integral whole that need each other. In this case the law of mutualism symbiosis applies.

Peatlands that are preserved are one of the natural resources that is very meaningful to the community's economy and are proven to provide many positive services on environmental aspects. Therefore, efforts to empower peatlands are an innovation to conserve peat ecosystems.

Although the use of peatlands has been proven to provide environmental and financial benefits, it is not easy to manage professionally based on local wisdom. Peatland management must be protected from damage to the ecosystem, protected from drought and fires in the dry season, protected from loss of livelihoods in the fisheries and fisheries sector, and maintained from the irregular land use change that often negatively impacts the survival of the peat ecosystem.

Conversion of peatland functions that are not calculated properly, will certainly have a negative impact on ecosystem sustainability. The characteristics of peatlands must still be adapted to the ideal conditions. The characteristics of peatlands, which were originally in the form of swamp forest ecosystems, should not be dwarfed because they only apply to monoculture plantation crops. The construction of canals that are prone to carbon loss and water content in peatlands, must still be balanced by building and developing canal blocking in order to maintain water stability. Avoid building ditches or ditches that override peatland water systems.

If there is a depletion of peatlands caused by nature and human activity, it will certainly affect social, economic, environmental, and even health impacts for local and global populations. If there is a peatland fire, it can be sure to incur economic losses, polluted air, and cause hundreds of thousands of residents to experience health problems and respiratory problems. To overcome and recover it requires a relatively large cost. On the other hand, there will be a depletion of peatlands. This condition will have an impact on reducing the important function of peatlands as water suppliers, flood control and preventing sea water intrusion to land.

The concept of restoring degraded peatlands requires a systematic recovery plan accompanied by relevant concrete actions. One effort that can be done is to carry out restoration (water management) by blindly blocking the canals and ditches and reforestation through the selection of adaptive plant species that can live in wetlands to help keep peatlands moist and always wet. Water stability on peatlands must

be maintained to prevent degradation and fire. Proper water management will hamper peatland subsidence.

An important objective of the analysis of the recovery program and development of peat ecosystems in East Kalimantan is to restore degraded areas as resources to prevent prolonged damage to peat ecosystems. Another important objective is to develop recommendations for development targets and community welfare through the empowerment of peat ecosystems.

The challenge that must be answered immediately is commitment and perception. All elements of stakeholders, consisting of Government, Private, Practitioners and Academics as well as community elements, must be integrated in a collective commitment, collective agreement, because they have a perception to realize the development and empowerment of peat ecosystems as a development agenda for the welfare of the community around peatlands.

Coordination between all elements of stakeholders, not only as a mandate and concept but must be implemented in a real movement (joint action) even with their respective portions and proportions. Coordination between all elements of the stakeholders will be seen as concrete if it starts by preparing an integrated work plan for the development and empowerment of the peat ecosystem.

Literature Review

Peat is an organic material that is formed naturally from the remnants of plants that are imperfectly decomposed and accumulated in swampy areas that were saturated with water for thousands of years ago. Andriesse (1992) in Noor (2001), asserted that peat is organic soil (organic soils), but that does not mean that organic soil is peat soil. Some farmers refer to peat as black soil, because the color is black and different from other types of soil.

Geologically peat can occur in the lowlands, highlands, or mountains with a temperate climate and cold. The type of peat depends on the depositional environment of its constituent materials. The composition of plants is also adapted to climate so that the resulting peat deposits are also different. Chemically, peat also contains sulfur which is formed from fine-textured pyrite minerals, having a heat value or containing calories. Therefore, productive peat requires forever wet conditions.

Physical properties that must be maintained on peatlands are wet or not dry. Peat has the nature to dry out easily when the water source is lost. This condition is common in agricultural programs with canal / ditch construction as one of the land drainage techniques. Making canals is done by cutting the contours of the shape of the earth. If the canal is not made parallel to the contour of the earth so that the water is retained, it can cause peat which is located higher will dry. If it is very dry, the peat will not get wet again. This is because peat is unable to absorb water again (irreversible).

The strategic issues most feared on peat or peatlands, both local and national scale are drought and fire. The impact is very widespread and influences various aspects of life, including health and well-being, and even social conflict.

Peat ecosystems are the order of the peat elements (biotic and abiotic) which constitute an overall, integrated whole that is mutually influential in shaping balance, stability and productivity. Ecosystems are the overall system of unity between all influential elements of the environment. Ecosystems are complex reciprocal relationships between organisms and their environment, both living and non-living, which together form an ecological system. Ecosystem is also an ecological system formed by an inseparable interrelationship between living things and their environment (Gumilar, 2012).

Efforts to restore the function of peat ecosystems can be done through: (a) peat ecosystem restoration; (b) peat ecosystem rehabilitation; and (c) other methods suitable for the development of science and technology. Peat ecosystem restoration can be done through the reorganization of the hydrological function in which the peat dome as a long-term storage of water, so that the peat remains wet and difficult to burn. Restoration of water systems is prioritized in areas of peat domes by completely closing all canals that have already been built or are naturally located. Restoration is continued by blocking the canals (blocking of canals) that are already around or at the bottom of the peat dome (including canals that are in the concessions of oil palm plantations, acacia HTI, and other community agriculture. It is understood that productivity Canal is because it has space to plant endemic vegetation that normally grows on peatlands, and the presence of vegetation above canal blocking is expected to strengthen the construction of the partition to prevent abrasion on the sides of the canal wall.

Peatland empowerment is in the context of developing ideal peatlands. This means it functions to provide water and energy sources. The nature of flammable peat and mining results will be a threat to the existence of peatlands and their environment, so that land empowerment and conservation are priorities, and the requirements to be socialized to the wider community and carried out constructively, systematically and sustainably.

Efforts to carry out conservation and sustainable management of peatlands require innovative strategies by optimizing community participation. The combination of infrastructure development and optimization of community participation and other related parties is absolute. Echols & Shadily (in Soetrisno, 2000: 419) emphasized that with community participation there will be stimulation and a sense of responsibility to take part in total development (including development indicators and dimensions). This condition is justified Davis (2000: 142) related to the meaning of participation as a form of mental and emotional involvement of a person or individual unit in a group situation that encourages him to contribute to the group's goals and is responsible for all his actions. Participation is part of the phenomenon of democracy in which people are involved in planning as well as in implementation and share responsibility according to their level of maturity and level of obligation.

As has been stated before that peatland management is the responsibility of all parties. The main key to the success of the program lies in the aspects of commitment, constructive and sustainable management, as well as collective agreements including optimization of community participation for the restoration of peat ecosystems. Active participation of all parties, especially the community is an absolute requirement, starting from the stages of planning, implementation, utilization, management, and not just enjoying the results of development. (Agus Suryono, 2001). This view agrees with Bachtiar Effendi (2002) who asserted that the success of development was due to the active role of the community in many ways and in making initiatives and decisions, as well as increasing all resources carried out in a planned and sustainable manner based on the principle of efficiency and effectiveness which is equitable and fair.

Participation is part of the principle of empowerment. Sumodiningrat (1999) defines empowerment as a series of support to improve capabilities and expand all access to life to be able to encourage sustainable independence of society. Sumodiningrat places empowerment as a strategic tool or media towards community independence. Slamet (2003) defines empowerment as an effort made to make the community able to build themselves so that the community can improve their lives. Empowerment is defined as an opportunity to see and take advantage of opportunities so that they can make the right decision in accordance with their initiative. Elizabeth (2007) gives the definition of empowerment as an effort made to show the strengthening of all who are in powerlessness so that empowerment is expected to be able to help themselves in developing the spirit of trust that already exists.

Owin (2004) defines empowerment as an effort to give strength to aspects of human resources, to physical and material aspects, as well as to managerial aspects. Empowerment directed at the community

means to be free from discrimination, vulnerability and or poverty. Community empowerment means trying to make the community prosperous and independent. The empowerment approach is the basis for the creation of community power. With strong human capital, then movements in the material and infrastructure aspects will also occur. Likewise, the management phase will occur simultaneously. Because the management stage is a very vulnerable stage, community facilitators are usually needed. This concept is in line with Hulme and Turner (1990) which defines empowerment as strengthening the community to be able to participate in decision-making processes that affect its future, strengthening the community to be able to obtain factors of production, and strengthening the community to be able to determine its future choices. The meaning of strengthening gives a signal to the importance of outside party intervention or what is called community assistants.

The collaborative approach, which is part of the principle of empowerment, is known as one of the strategic approaches because it implies coordination, cooperation, and not non versarial approach, especially in terms of problem solving and conflict resolution (Straus, 2002). In practice, this collaborative approach is widely used to resolve disputes between parties in multi-party conflicts. Peat ecosystem management, very vulnerable to social problems because the solutions found together, may be contrary to local wisdom or to the habits of local farmers.

More specifically, some experts such as Wondolleck and Yaffee (2000: 18-19) see the collaborative process approach of four main uses, namely: (1) building understanding through increasing the exchange of information and ideas between government agencies, organizations and the public, and providing a mechanism for resolving uncertainties; (2) provides a mechanism for effective decision making through processes that focus on shared problems and build support for decisions; (3) produce a tool for making good work through coordinating cross-border activities, enhancing joint management, and mobilizing an expansion of resource scenarios; and (4) developing the capacity of government institutions, organizations and communities to meet future challenges.

Because collaboration management is synonymous with partnership, the spectrum of partnership management can be grouped into several types. Collaborative management on the restoration of peat ecosystems may have been tried and practiced. It is possible that the results are close to being successful and some are the opposite. The experience of Chrislip and Larson (1994: 51-54) has provided learning that the critical point of collaboration management lies in its strategy. There are ten factors which according to him as the success factors of the collaboration strategy are: (1) being on time; (2) clear needs; (3) supported by a strong stakeholder group; (4) broad involvement (seeking the involvement of many participants from various sectors); (5) credibility and openness of the process; (6) commitment and involvement of top level or visionary leaders; (7) supports or approves the determination of authority or power; (8) overcoming mistrust and skepticism; (9) strong leadership to the process of temporary success; and (10) moves to a broader concern.

Methodology

The analysis of the study was centered in Muara Kaman District, Kutai Kartanegera Regency and in Muara Bengkal District, East Kutai Regency. As usual, the analysis process starts from preparation, coordination, field orientation, outreach, preparation of activity plans and implementation.

Data collected through observation, interviews and focus group discussions. (Pasolong: 2012, Hetifah Sj Sumarto: 2004, Vredenbregt: 1981, Young and Schmidt: 1973, Singarimbun and Effendi: 1985). The assessment tools used include: (1) community data inventory; (2) the formation of TK-PPEG; (3) creating a social map of the village based on peat ecosystems; (4) transect walk; (5) Rapid Technical Assessment (RTA).

Data analysis using descriptive methods. A method designed to gather information about real conditions (while in progress) and examine the causes of a symptom. For this Descriptive Method combines document analysis (content analysis) with trend analysis/trend analysis. (Travers: 1987 and Consuelo G. Sevilla - Jesus A. Ochave - Twila G. Punsalan - Bella P. Regala - Gabriel G. Uriarte: 1993).

In descriptive research, researchers do not have control over certain variables to explain social phenomena. Control over variables is in the hands of research subjects or participants. the main purpose of the descriptive research method is three namely: describing, explaining, and validating research findings. Researchers achieve these goals after describing the characteristics or behavior of individuals or social groups under study.

Results and Discussion

Descriptive analysis with the PRA approach focuses on efforts to obtain information and data related to peat ecosystems, problems and solutions. At each stage the activity has involved the community with the principle of empowerment.

The establishment of TK-PPEG at the beginning of the process is a strategy to increase community participation. They are involved in an inventory of community data, are involved in making social maps of the village based on peat ecosystems, are involved in carrying out a village walk (transect walk) and rapid assessment of peat ecosystems (Rapid Technical Assessment / RTA), and are involved in identifying priority program options. Then the priority program choices are packaged in the Community Work Plan (RKM).

As a representative of the community, TK-PPEG who are actively involved in each stage, have learned new lessons about their own survey in order to identify problems and analyze the situation. They are absorbed in the process of study and analysis in accordance with the principles and principles of empowerment. Almost all choices and decisions are in the hands of the community. In the principle of empowerment, this concept is known as Community Driven Development (CDD).

The results of the survey itself with a focus on problem identification and situation analysis. the following data and information are obtained: (1) degradation of river water quality in peat ecosystem areas due to pollution by the community and disposal of waste and pesticides / fertilizers on the location of agricultural land; (2) deterioration in environmental quality due to peatland fires; (3) there are community characteristics that are still difficult to be involved in development activities, apathetic tendencies; (4) the deterioration in the quality of the peat environment that was once flooded, now has become dry and has the potential to re-ignite; (5) many canals are found by companies around the peat location; and (6) lack of community awareness about the risk of clearing land by burning.

The results of the joint study obtained the formulation of program options for the recovery and control of the peat ecosystem as follows: (1) the construction of Canal Blocking which is expected to reduce the decrease in water quantity, so that the peatlands are wet; (2) procurement of water control devices around the canal blocking; (3) land management in peat areas for agricultural commodities, food crops and horticulture in accordance with land use; (4) management of aquatic areas in the hydrological area of peat ecosystems for aquaculture in accordance with the utilization and use space; (5) training programs on fish farming and farming techniques on peatlands with active involvement of farmers in them; (6) environmentally friendly fishing gear procurement program and environmentally friendly fishing group fishing; (7) program for the procurement of plantation crops (Coffee, Chocolate, Pinang and others) on agricultural land; and (8) campaign to change people's behaviour so as not to open agricultural land or clear peatlands by burning.

Conclusions and Recommendations

Strategies for developing and empowering peat ecosystems can be done in various ways. The results of the analysis found the following conclusions and recommendations: (1) optimizing community participation in each phase of activities for the purpose of increasing capacity, growing contributions, fostering a sense of ownership, and fostering a sense of responsibility to maintain the sustainability of the program with the principle of preserving peatlands; (2) maintaining the condition and or maintaining the level of peat water through the making of canals now; and (3) empowering the community means increasing public awareness to be able to sustain and preserve the peat ecosystem in a sustainable manner through a particular commodity culture system that has economic value based on local wisdom.

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