

Community participation in conservation of petungkriyono protected areas in pekalongan district

Marthalia Woelansari^{1*}, *Maryono Maryono*^{4,3}, *Fuad Muhammad*⁴, *M. Arief Rahman Halim*^{2,4}, *Agus Setyawan*⁵

¹Master Program of Environmental Science, School of Postgraduate Studies, Diponegoro University, Semarang - Indonesia

²Doctor Program of Environmental Science, School of Postgraduate Studies, Diponegoro University, Semarang - Indonesia

³Department of Urban and Regional Planning, Faculty Engineering, Diponegoro University, Indonesia

⁴Centre for Green Infrastructure Resilience and Development, School of Postgraduate, Diponegoro University, Indonesia

⁵Department of Physics, Faculty of Sciences and Mathematics, Diponegoro University, Semarang - Indonesia

Abstract. The government determines forests based on the main functions of: Conservation forest, protection forest and production forest. The Petungkriyono protected forest is one of the conservation areas located in the Petungkriyono, Pekalongan City. Conservation of protected forests in Petungkriyono is very much needed considering the development of the wider city, so that the forests that were originally forest areas that functioned as green open spaces have been greatly reduced, especially in areas along the river that leads to Pekalongan City. The research method used in this study is to use descriptive research methods. The data collection technique used is the study of literature. Data analysis techniques were performed using a Likert scale calculated by discriminant analysis. Type of participation contributed by the community in the protected forest area of Petungkriyono; a) participation of ideas, b) energy, c) property, d) skill e) social participation. The form of community participation in the conservation of the Petungkriyono protected forest area; a) active participation, b) passive participation. Geographical factors that serve as a reference for the importance of conservation of the Petungkriyono protected forest are: a) habitat, b) consideration of the area, c) physical and human factors, and d) economic value.

Keywords. Conservation, Protected Forest, Community Participation.

1. Introduction

* Corresponding author: marthalia.woelansari@corp.bri.co.id

Forest areas are certain areas designated and / or determined by the Government to be maintained as permanent forests. The government determines forests based on the main functions of: Conservation forest, protection forest and production forest. Conservation forest is a forest area with certain characteristics, which have the main function of preserving the diversity of plants and animals and their ecosystems [7]. Nature conservation forest areas are forests with certain characteristics, which have the main functions of protecting life support systems, preserving diversity of plant and animal species, as well as the sustainable use of biological natural resources and their ecosystems, and hunting parks are forest areas designated as hunting sites [14]. According to Government Regulation of the Republic of Indonesia No. 45 of 2004 concerning Forest Protection, Forest Protection is an effort to prevent and limit the destruction of forests, forest areas and forest products, caused by human actions, livestock, fires, natural resources, pests and diseases, and defend and protect the rights of the state, the people and individuals over forests, forest areas, forest products, investments and instruments related to forest management [11]. The Petungkriyono protected forest is one of the protected forests which is a conservation area in Central Java. The problem in the upstream part of the Petungkriyono protected forest is the development of residential areas and fields so that many people take wood by cutting down trees in the forest. Community participation is needed to preserve existing forests, because it can be said that the key to success in preventing and dealing with existing forest damage is determined by the size of community participation [12]. Based on the description above, the authors are interested in conducting research on efforts to preserve the protected area of the Petungkriyono Forest in Pekalongan Regency. Issues that will be raised in this study are: "How is community participation in efforts to preserve the protected area of Petungkriyono Forest in Pekalongan District?" The purpose of this study was to determine community participation in efforts to preserve the protected forest area of Petungkriyono in Pekalongan Regency. The application of this research is expected to be accepted by all parties and especially by stakeholders to take strategic policies related to advanced management in the protected forest area of Petungkriyono.

2. Methodology

The method used in this research is descriptive method, which aims to examine the problems that occur now by collecting data, compiling and classifying data, then analyzed. The data collection technique used is the study of literature. Data analysis techniques were performed using a Likert scale calculated by discriminant analysis. Likert scale used to measure the attitudes, opinions and perceptions of a person or group about social events or symptoms.

3. Result and Discussion

3.1 Result

Administratively the protected area of the Petungkriyono Forest belongs to the government of Petungkriyono Subdistrict, Pekalongan Regency, located about 34 km from the center of Pekalongan city. Petungkriyono Subdistrict is a mountainous area with a height of between 600-2100 meters above sea level (Mdpl) where most of the area is a plateau area of the North Serayu Mountains. To the south is the Dieng Plateau Region with mountain chains such as Mount Rogojembangan. In addition there are Mount Kendalisodo, Mount Sikeru, Mount Perbata, Mount Geni, and Mount Kukusan. Petungkriyono District is the headwaters of three major rivers, including the Wola River, Sengkarang River and Kupang River (Kali

Pekalongan). Subdistrict of Petungkriyono which has a tropical climate with two seasons in one year, dry and rainy season, with daytime temperatures ranging from 19 - 28 0C. In July to August it drops to 100C. The Petungkriyono protected forest has territorial boundaries as follows: North side: bordering Talun District, South side: bordering Banjarnegara Regency, West Side: bordering Lebakbarang Sub-district East: bordering Batang Regency. The area of Petungkriyono Subdistrict is 7,358,523 Ha, most of which are State forests covering 5,189,507 Ha. The protected forest has an area of 1931.90 ha [8]. Settlement area is only 119,652 Ha (16%) of the total area. The area of paddy fields in Petungkriyono Subdistrict in 2006 was 234,450 ha and the type of irrigation used was simple irrigated paddy 234.45 ha. While the area of non paddy land in 2006 was 7,124,073 ha consisting of yard buildings covering 119,652 ha, tegal / garden covering an area of 1,379,702 ha, fields / huma covering an area of 63,616 ha, grasslands covering an area of 2,025 ha, ponds / tangs / ponds covering 6,310 ha, community forests 340,836 ha, state forests 5,189,507 ha and others 22,425 ha. The area of critical land based on the level of criticality in 2006 was 1,165,000 ha consisting of 160,000 ha of critical land, 719,000 ha of rather critical land and 286,000 ha of potentially critical. The Petungkriyono protected forest is one of the remaining tropical forests in Java and is a habitat for endangered species, namely Javan gibbon, leopard, and Javanese eagle. The Petungkriyono protected forest functions as a Limited Protected Forest, the Petungkriyono protected forest is still a relatively protected primary forest, with a tropical rain forest type. Primary forest is forest that has never been cleared [9].

3.2 Discussion

3.2.1 Community participation

The high number of population growth also increases the need for residential land or other infrastructure. The government regulates a nature conservation area that has native ecosystems, managed with a zoning system and can be used for education, research, cultivation development, recreation and tourism activities [13]. At this time the people in the protected forest area of Petungkriyono broadly increasingly understand the importance of conserving forests, even though that understanding is still relatively quite diverse. Without realizing it, the existence of a conservation forest is very important to maintain the function of a sustainable forest as a supporter of life support systems [2]. From its historical development, the people in the Petungkriyono area have had a very close relationship with the forest area since before the area was designated as a protected forest area. In seeing a community group in relation to the forest, it can generally be distinguished as a community around the area and a "city" community. Community groups around the area itself can be categorized into 2 (two) large groups; indigenous people who uphold customary laws and norms as agreements that govern their daily life patterns. Not only regulates the life patterns of relationships between people, but also traditional wisdom that regulates their relationship with nature and the use of natural resources in a balanced manner [6].

There are also migrant local communities who, due to certain objectives, eventually settle in new locations around or within the area. Some of the migrant communities formed their own groups, others mingled with indigenous communities or with migrant groups that already existed in the area. This community group also has a very close relationship with nature and forests since its existence in the new location. The "order" that they profess is diverse, some adopt some of the values of local customs, some carry some of the order and culture that has long been owned. The "city" community is indeed located relatively far from the forest area. Nevertheless, their existence, whether they realize it or not, still has something to do with forests and forest functions. For example, wood, building materials

and tools and many types of materials used in daily necessities also come from the forest. Water for drinking, washing is also a product that cannot be separated from the role of the forest in regulating its functions, so that if the forest is no longer able to play its function, floods can occur during the rainy season and drought when drought comes. The direct involvement of urban communities in forests is very limited. Sometimes they "come" to the forest for a tour or just recreation or even hunting, for certain groups of people. This reflects the diversity of perspectives and "arrangements" that these groups have in relation to natural resources and "forests". Conservation Forests, as a concept of forest ecosystem management offered by the government, can be said to be a relatively "new" arrangement when viewed from the point of "naming" [3]. However, when examined further, the concept of conservation areas, in the principle of managing natural resources in a balanced and sustainable manner, may not be new to indigenous peoples who uphold their indigenous norms and customary laws. For local communities and "city" communities, which are not bound by customary law, normatively it is helped a lot by general and religious norms which encourage to always do good, use natural resources wisely and not excessively, and maintain the balance of nature [4]. Community involvement is needed in the success of the environmental preservation program, which is carried out in several stages:

1. Planning

Planning is carried out by the government and influential parties around the Petungkriyono protected forest area. This plan is carried out in order to minimize the good and bad impacts that will occur in the implementation of conservation of protected forests in Petungkriyono.

2. Implementation of programs

Programs that have been carefully planned and then applied by involving the community around the protected forest area of Petungkriyono. The activity has already taken place but indeed because of the diverse understanding it is possible that not all communities participate in conservation activities. Implementation is monitored or monitored by the parties responsible for these activities, including the government.

3. Evaluation

Evaluation is carried out regularly by the government and those who understand the program. In this evaluation process, areas that are indeed conserved and those that are exploited will be compared. Then it will proceed back to the planning stage or determine an advanced program. Communities are not only given information about the existence of protected forests, the goals and conservation efforts undertaken, but furthermore they are invited to participate in conservation activities and management activities, both directly and indirectly. An illustration of the flow of interpretation activities is illustrated in the following diagram:

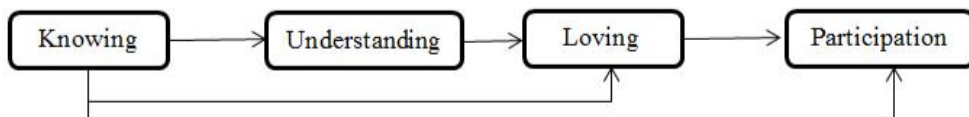


Fig. 1. Illustration of the flow of interpretation activities

- Knowing: At this stage most of the people in the protected forest area of Petungkriyono know / know that preserving the forest is important for the survival of the community. The community knows that there is a connection between their behavior in protecting the environment and influencing the environment.
- Understanding: At this stage the community in the Petungkriyono protected forest area in terms of quantity or quantity has begun to decrease compared to the familiar stage. Among the people it turns out that they only know without understanding

deeper the meaning of what they know about environmental sustainability. Many of them are still indifferent to the condition of their environment affected by exploitation. Loving At this advanced stage, people who know and understand instill in their thinking and behavior placing environmental sustainability as an important part of the community.

- Participation: At this stage the application / practice of what people know and understand. Communities who understand more deeply about environmental sustainability will have the movement in the form of behavior to preserve the environment by conserving the environment, protecting the environment, and obeying applicable rules [1]. The types of participation contributed by the community in the Petungkriyono protected forest area can be detailed as follows:
 - (1) Participation of ideas, namely contributing thoughts of experience, knowledge in meetings such as meetings that are held regularly; Communities that are active in submitting proposals are as many as 50% (25) people and those who participate in exploring ideas are as many as 40% (20) people. The community considered that their presence in the meeting to provide input, ideas and ideas was important. According to Slamet (1994) without someone's presence it is impossible to participate in planning. In this case it was concluded that community participation in protecting the protected forest area of Petungkriyono was quite high. All beneficiaries participated in the implementation of the empowerment program. Community participation increases sustainability, when people are involved in decision making, people feel they have and are motivated to maintain it, but it takes time, resources, logistics and the organization is troublesome (Buckland et al., 2010). The results showed that the level of community participation in the protected forest area of Petungkriyono was at the level of acting together. The community participates actively from the planning stage to the implementation of the program.
 - (2) Participation of workers, in various activities whose purpose is to repair or develop villages, help for others and so on. In terms of implementing community empowerment, the enthusiasm of the community to participate is very high. A total of 50 respondents (100%) participated in the implementation of community empowerment. The participation is in the form of energy / time. The community considered that this participation would benefit him and he believed that by participating in the implementation of conservation, it would minimize the impact of forest destruction.
 - (3) Participation of property, which is given by someone in an activity for the repair or construction of a rescue village for others and so on. The community also has a willingness to participate in property as much as 70% (35). Participation of these assets can be in the form of collecting materials in the form of money or objects that people have in their homes to donate to preserve the environment.
 - (4) Participation in skills and skills, given by people to encourage a variety of forms of business and industry. The community participates in 40% (20) skills and proficiency by making planks or rules to dispose of trash in their place or prohibition to destroy the forest.
 - (5) Social participation, which is given by people as a sign of community such as participating in social gathering, cooperatives and others. There are two forms of community participation in the conservation of the Petungkriyono protected forest area:
 - a. Active participation, which is inviting others to gain reach and improve the results of the program being launched, because the results of the program are felt by the community as a success of the community itself. As many as 70%

- (35) of the community actively participates and cooperates with educational institutions and the government to do simple things that are beneficial or of positive value to the environment.
- b. Passive participation, that is, not rejecting a development program. This includes improving infrastructure facilities in the Petungkriyono protected forest area and repairing roads as a means of transportation to the Petungkriyono protected forest. People in the Petungkriyono protected forest area as much as 100% (50) do not oppose a development program in the Petungkriyono protected forest area.

3.2.2 Geographical Factors

The Petungkriyono protected forest area is a forest area that has an important value for the survival of life. Forests that have ecological, economic and social functions. In the management of forest areas, the community involvement as a subject in management must be established. Along with population growth, economic growth and industrialization pressure on natural resources increased. This is due to an increase in the demand for natural resources both in quantity and quality. Protection of environmental carrying capacity includes efforts through ways to preserve and preserve the quantity and quality of the environment [9]. These efforts are carried out with the aim of preserving environmental functions and preventing environmental degradation or damage caused by human actions. The results showed that the community participated in efforts to preserve the area. Various backgrounds regarding the importance of conserving forest resources on a global to local scale, demand further explanation of the various considerations that need to be known as the basis for establishing protected forest areas. Biological considerations that underlie the identification of conservation areas, with a view to providing guidance to planners, both within the conservation officer and other parties who are interested in or involved with the establishment of protected forest areas.

3.2.3 Biodiversity

Geographical information like this is very important in the determination of protected forest areas, through the distribution of geographical units as management units based on their uniqueness, for example mountainous areas, low-lying areas, offshore islands and so on. The diversity of flora and fauna in the protected forest area of Petungkriyono shows the preservation of the forests there. The diversity of animal and plant life in nature includes a diverse set of habitats. According to Widhiono's research (2015), in the Petungkriyono protected forest area during the sampling period found 63 species of birds, 41 species of orchids consisting of 29 species of epiphytes and 12 terrestrial species, 104 species of butterflies, 19 species of ferns, 4 species of primates and 22 species tree. Some species of organisms found in the Petungkriyono forest are endangered and protected species based on PP no 7 of 1999 concerning protected flora and fauna types. These species are of primate species, Black Lutung (*Trachypitecus auratus*), Surili (*Presbytis comata*), Javan Gibbon (*Hylobates moloch*), Black Hawk (*Ichtaetus malayensis*), Javanese Hawk (*Nisaetus bartelsi*), Julang mas (*Aceros undulatus*), while from plant species found *Macodes petola*, and *Kantung Semar (Nepenthes adriani)*. Biota that lives in the protected forest of Petungkriyono requires a whole large living space to survive. Habitat recognition for each group needs to be done so that they can know with certainty whether a group or species is a specific type that can only live in one particular place or even vice versa a group or type does not have a specific place of residence or can live in any place so that its existence is not necessary special attention [11].

3.2.4 Regional Considerations

The need for space to live from various elements of flora and fauna is different. In addition, not only the interests of flora and fauna, but there are links with human interests. The protected forest area of Petungkriyono is very important for life, because many people around the forest depend their lives on the existence of the forest. The Petungkriyono protected forest area needs to be preserved and preserved given the role of protected forest status is very important for ecological sustainability. This Petungkriyono protected forest area will be a protector for other areas in the vicinity. In addition to these considerations, this area is an upstream of the kupang river whose existence is important in supporting community needs in water use. Determination of a protected forest area is very important to get support from the local community, so that the development of the area gets a joint commitment. Humans as actors and beneficiaries must play an active role in environmental preservation programs. The economic value of protected forest areas is home to a number of tropical forests and important biodiversity resources. These resources provide benefits at the local, national and global levels. Even though it is not too tempting from an economic perspective, there are still economic benefits that are felt in the long run compared to the over-exploitation of forests [13]. The term economic resource valuation is an economic tool that uses resource valuation techniques to estimate the monetary value of goods and services provided by conservation areas.

4. Conclusion

Types of participation contributed by the community in the Petungkriyono protected forest area; a) participation of ideas / ideas, b) energy participation, c) property participation, d) skill and skill participation and e) social participation. The form of community participation in the conservation of the Petungkriyono protected forest area; a) active participation, b) passive participation. Geographical factors that serve as a reference for the importance of conservation of the Petungkriyono protected forest are: a) habitat, b) consideration of the area, c) physical and human factors, and d) economic value.

Acknowledgment

The research is funded by Directorate Research and Community Services, Deputy of Research Development, Ministry of Research and Technology / National Research and Innovation Board with cooperation between Institute of Research and Community Services Diponegoro University taskforce letter No. 255-141/UN7.6.1/PP/2020.

References

1. Ackermann F., Eden C. Strategic management of stakeholders: Theory and Practice. *Long Range Planning* (44):179-196. (2011)
2. Borrini F.G., Pimbert, M., Farvar, M.T., Kothari, A., Renard, Y. *Sharing Power Learning by Doing in Co-management of Natural Resources Throughout the World*. London (UK): International Institute for Environment Development. (2004)
3. Boyce C., Neale P. *Conducting In-Depth Interviews: A Guide Designing and Conducting In-Depth Interview for Evaluation Input*. Watertown (USA): Pathfinder International. (2006).
4. Bryson J.M. What to do When Stakeholders Matter: Stakeholder Identification and Analysis Techniques. *6* (1): 21-53. (2009)

5. Buckland, S.T., Plumptre L.T., Rexstad E.A.. Design and Analysis of Line Transect Surveys. *Int. Journal Primatology*, **(31)**:883-847. (2010).
6. Daymon C., Holloway, I. *Qualitative Research Methods in Public Relations and Marketing Communications*. New York (US): Routledge Taylor and Francis Group. (2011).
7. Moravcik, M., Z. Sarvasova., J. Merganic., M. Schwarz. Forest Naturalness: Criterion for Decision Support in Designation and Management of Protected Forest Areas. *Environmental Management*. **(46)**:908–919. (2010).
8. Peraturan Pemerintah Republik Indonesia No 45 Tahun 2004 tentang Perlindungan Hutan.
9. Reed, M.S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Presll, C., Quinn CH., Stringer, L.C. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environment Management*. **(90)**:1933-1949. (2009).
10. PP no 7 tahun 1999 tentang Jenis Flora dan Fauna yang dilindungi
11. Proctor, S., C.J. McClean, J.K. Hill. Protected areas of Borneo fail to protect forest landscapes with high habitat connectivity. *Biodivers Conserv*. **(20)**:2693–2704. (2011).
12. Sardjono, M.A. *Mosaik Sosiologis Kehutanan: Masyarakat Lokal, Politik dan Kelestarian Sumberdaya*, Debus Press, Yogyakarta. (2004).
13. Sawchuk, J.H, Beaudreau, A.H, Tonnes, D., Fluharty D. Using stakeholder engagement to inform endangered species management and improve conservation. *Marine Policy*. **(54)**: 98-107. (2015).
14. Shwiff, S.A., Anderson, A., Cullen, R., White, P.C.L., Shwiff, S.S. Assignment of measurable costs and benefits to wildlife conservation projects. *Wildlife Research*. **(40)**:134-141. (2012)