

Review of Forest Management in Indonesia Towards a Sustainable Environment

Sayidah Ummul Solihah^{1,*}, Achmad Nurmandi², Helen Dian Fridayani³

¹ Department of Government Studies, Faculty of Social and Political Science, University of Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, 55183

² Department of Government Studies, Faculty of Social and Political Science, University of Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, 55183

³ Department of Government Studies, Faculty of Social and Political Science, University of Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, 55183

*Code Email: helen.dian@umy.ac.id

ABSTRACT

This study aims to analyze the efforts made by Indonesia in managing the forest environment. The reason is that Indonesia is ranked 164th out of 180 countries regarding environmental performance by The Environmental Performance Index (EPI) with a score of 28.20 points which is categorized as a country with low forest management. This study uses a qualitative method with research data obtained by means of desk studies from secondary data through online mass media reports in the period 2020 – 2024 and previous studies both from photos, archives, documents, and reports. The results of the study show that the forest management process in Indonesia is more inclined to efforts to preserve nature. Although various methods have been carried out, obstacles are still found in the fragility of the forest resource asset security system, weak forest institutions in the field, and the control of licensing administration by the government are factors that worsen forest management in Indonesia. So that the efforts made by Indonesia in managing the forest environment have not been optimal and are very far from perfect.

Keywords: Sustainable Environment, Management, Forests, Indonesia

INTRODUCTION

Indonesia was ranked 9th in the world in 2019 with a large forest ownership category of 50.1% or about 94.1 hectares of total land. Forest areas occupy 86.9% of the total forest area of 92.3% of the total forest area. In addition, 17% of the world's species live in the world, consisting of mammals as much as 12%, various types of birds as much as 37%, reptiles and amphibians as much as 15%, flowering plants as much as 11%, and fish species as much as 37% (Rahmadanty, Handayani, a Najicha 2015). Wealth in natural ecosystems in Indonesia has a strategic value in human survival. So that the forest becomes an ecosystem dominated by various trees as well as animals and plants in an inseparable natural communion.

Data from the Ministry of Environment and Forestry stated that in 2015 Indonesia's territory consisted of 27.4 million hectares of conservation forest areas containing 250 nature reserves, 11 tourist parks, 75 wildlife sanctuaries, 50 national parks, 23 forest parks, and 13 marine water areas and new parks. Some of these areas are managed by the local government and collaborate with various parties in their management. Unfortunately, conservation programs in Indonesia have not been achieved due to the large number of land conversions, illegal logging, and forest fires. This is because environmental issues will be one of the main challenges faced by society in the future (Risma 2018). Another thing is also caused by the increase in the number of people who demand the needs of food, carpentry wood, firewood, and settlements, which will reduce the forest area in Indonesia. Therefore, maintaining and preserving forests is a shared responsibility so that the preservation of the

forest environment can provide benefits for the survival of the community and future generations.

In striving for forest sustainability, an ecosystem balance is needed in the form of reciprocity between humans and the environment. Various components in the ecosystem will be indifferent when there is a balance in it. The ecosystem components will interact with each other to provide the necessary and needed needs. The form of maintaining the balance of the forest environment can be done by implementing a sustainable environmental system. According to the World Commission on Environment and Development, sustainability is defined as the ability to meet current needs to meet one's own needs without sacrificing the capabilities of future generations. In addition, by implementing a sustainable environment, balance, resilience, and interconnectedness in the forest ecosystem will be created for an unlimited time.

Sustainable environment is currently a trend in emphasizing the sustainability of ecosystems in the future. By prioritizing a sustainable environment, it is in increasing and protecting biotic diversity and as a form of system in supporting life. In addition, it is also an adaptive and preventive strategy to respond to changes in the global environment. On the other hand, it is also to implement and develop rehabilitation measures, improve and maintain the integrity of damaged ecosystems. In addition, the condition of the forest environment in Indonesia is currently concerning. The reason is that throughout 2015 – 2022, the Ministry of Environment and Forestry recorded a deforestation rate of 3.1 hectares. One of the areas that is threatened in planned deforestation is Papua with the remaining 34 million hectares per 2022 (Arif 2022).

Therefore, the concept of forest management in Indonesia is needed to be a challenge that must be solved. Thus, the novelty of this study is to examine forest management in Indonesia towards a sustainable environment.

LITERATURE REVIEW

Indonesia is ranked 164th out of 180 countries regarding environmental performance by The Environmental Performance Index (EPI) with a score of 28.20 points (Santoso 2024). This is undeniable because the development of science and technology has an impact on environmental damage due to overexploitation (Effendi, Salsabila, A Malik 2018). The exploitation of natural resources and the environment has resulted in a drastic decline in environmental quality, especially in terms of natural resources (Nisa a Suharno 2020). In fact, in the order of the social and environmental environment, it is important to always pay attention to the balance of the environment to prevent various forms of disasters. So that awareness of the importance of environmental management and wise use of natural resources is important to be carried out in order to achieve a sustainable environmental balance (Ainia 2024).

It should be noted that a sustainable environment is a concept of maintaining and maintaining environmental conditions to ensure the continuity of living things in it by providing welfare (Wulandari et al. 2022). This is in line with the research (Sembiring 2022) which states that sustainable environment is related to environmental management that applies and understands knowledge about the environment and can interact with everything that exists to improve the quality of their experience. Sustainable environment encompasses the existence of living things that affect life both naturally and through human intervention to maintain their sustainability without time limits (Effendi, Salsabila, A Malik 2018). Explain several important aspects of the sustainable environment such as the use of renewable energy, conservation of natural resources, pollution and waste reduction, biodiversity protection, and environmental awareness (Siregar 2023). In research (Effendi, Salsabila, A Malik 2018) mentioned two indicators in environmental management, namely in the form of environmental indicators consisting of variables of nature conservation and efficient energy and environmental consideration indicators consisting of variables of waste emissions, pollution control, and waste management.

Some aspects that should not be left out of a sustainable environment such as; Waste and pollution reduction includes curating greenhouse gas emissions, implementing environmentally safe waste treatment practices, and controlling water and air pollution. Second, Conservation of natural resources in a sustainable way which includes the management of forests, soil, water, and other natural resources. In its management, it must prioritize responsible and efficient resources and keep an eye on availability and quality for the future. Third, education and awareness of the importance of a sustainable environment. This can be done in various ways such as encouraging active community participation in sustainability efforts, seeking and encouraging support in pro-environmental policies, and educating about sustainable views and ways of life. Fourth,

biodiversity protection such as controlling the invasion of alien species through the preservation of natural habitats and carrying out conservation efforts for the preservation of endangered flora and fauna. Fifth, using renewable energy such as hydroelectric, wind, and solar as a substitute for fossil energy sources (Siregar 2023).

A new and permanent arrangement has emerged by providing a basis for forest management starting from the planning stage, co-management of forest resources, to monitoring and stakeholder engagement. Not only that, the Forest Management Unit (FMU) is also a key role in pursuing sustainable development in terms of mitigation, adaptation to climate change, economy, and biodiversity conservation. With the existence of KKPH, decentralization and transformation can be realized in the integration of existing resources and synergy between institutions and governments in forest management. The presence of FMUs is expected to improve as a momentum for forest governance in Indonesia. FMUs are formed based on the mandate of laws and regulations regarding forest resources. If the foundation for development is regulated in a number of Government Regulations and the technical basis for implementation is regulated by a number of Ministerial Regulations, then the policy basis for FMU Development is based on several laws.

Interestingly, Small and Medium Industries (SMEs) in Bogor Regency and City have used a sustainable environment system in the manufacture of footwear. Where the manufacture of socks from the side of environmental sustainability is assessed from three dimensions of sustainability starting from the social dimension, environmental dimension, and economic dimension. In the social dimension, sock making is seen from the aspects of social compliance, anti-corruption and human rights, consumer problems, human resources, training and education, as well as security and health. In the environmental dimension, it is driven by supplier assessment, energy efficiency, environmental compliance, material efficiency, land use, water management, emission management, and waste management. As for the social dimension, it is seen from the perspective of sustainable spending, income distribution, as well as stability and profits (Sukmawati et al. 2020).

The same thing is also done by the government and the community in Gunungkidul Regency in water conservation for sustainable water management. Sustainable water conservation is carried out because the Gunungkidul area is a karst area so that it experiences a severe drought every year (Arida 2022). Efforts are made by making reservoirs and rainwater collectors (PAH) to collect rainwater in every house and plantation. In addition, it also uses appropriate technology to process brackish water into fresh water for public consumption. In this case, the Gunungkidul government involves the community through community organization.

According to research (Lanni 2023) The community needs awareness as a form of means, processes, and steps in changing behavior and awareness towards sustainable environmental awareness. One of them is awareness of the importance of a sustainable environment in the form of

campaign communication for the people of Kodingareng Island by Dispotmar Lantamal VI. Other awareness was also carried out by providing education to community empowerment groups in Prayan Srimulyo Piyungan Hamlet. It was found that many factors can affect public education about the environment such as traditional and cultural aspects of the community. In addition, community leaders, educators, and policymakers also play a very important role in environmental sustainability education to collaborate with each other to improve the practice of environmental sustainability education in the community (Kusuma et al. 2023).

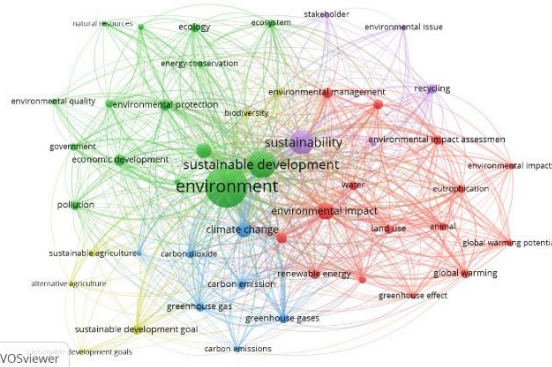
In striving for a sustainable environment, it can also be done by utilizing organic waste as done by the people of Batu City. Organic waste is processed using black soldier flies to become maggot food. The results of organic waste processing can be sold to increase income and can reduce the amount of organic waste in the community and support the creation of a sustainable environment (Azriya, Novalia, a Pasetya 2022). In addition, the implementation of a sustainable environment is also implemented in the tourism sector based on renewable energy. Community behavior is considered to have high social, environmental, and economic urgency in creating a sustainable tourism village. The potential for sustainable tourism village development is increasingly massive by adopting sustainable behavior and always paying attention to the welfare of local communities and environmental sustainability. However, in its implementation, education programs, community empowerment, and sustainable infrastructure based on renewable energy are still needed (Ma'arif, Sari, a Indraswari 2023). Not only the tourism sector, sustainable environmental efforts are also applied in coral reef restoration in Bali through a labor-intensive scheme by the community by means of coral reef transduction (Luthfia et al. b.r.). But in the sustainable environment-based tourism sector, there are still major obstacles to waste treatment. The same thing happened to the difficulty of waste treatment in India and South Kerala (Luthfia et al. b.r.).

A quite serious problem for Indonesia today is environmental damage and pollution that is increasing every day. The poor environmental conditions in Indonesia make the environment increasingly receive more attention (Luthfia et al. b.r.). All Indonesian citizens have a great responsibility for environmental problems because they transport the quality of life of future generations. The environmental community also plays a very important role as a form of community involvement in creating a sustainable environment (Luthfia et al. b.r.). The exploitation of natural resources and the environment has led to the deterioration of the quality of the environment, especially natural resources (Herlina A Supriyatin 2021).

The poor quality of the environment is caused by overexploitation, especially in the forestry sector. Forests as the lungs of the world are mostly damaged and cause other environmental damage such as landslides, floods, and many more (Nisa a Suharno 2020). In fact, forests are a complex environment as part of a natural landscape that must be managed wisely in order to achieve balance and minimize damage to the forest environment in the long term (Dahlan

et al. 2021). This is in line with the research of Arief Hidayat and Adji Samekto in (Trisna 2018) which explains three actions of past generations that can harm the environment in future generations. First, the massive use of natural resources which results in future generations not having more resources. Second, the use of natural resource today should not be known for its best benefits, so future generations will have to pay for inefficiency. Third, excessive consumption of natural resources results in expensive payments to future generations to consume each other's existing resources. In research (Rahmadanty, Handayani, a Najicha 2015) also categorizes forest management into four forms ranging from forest reclamation and rehabilitation; forest management and preparation of forest management plans, forest conservation and protection, as well as forest use and utilization.

Figure 1. VOSviewers Analysis with Keyword Sustainable Environment



(Source: Data Analyzed Using VOSviewer Bibliometrics, 2024)

The results of the VosViewers analysis above examine more related to the environment from the aspects of sustainable development, environmental impacts, economic management, and climate change. Although sustainable environmental management efforts have been implemented in several fields, research related to environmental sustainability in the forestry sector is still limited. Therefore, in this study, a gap was found in the form of forest management in Indonesia towards a sustainable environment.

METHOD

The research method used in this study is in the form of descriptive research with a qualitative approach. Qualitative descriptive research is very appropriately used to describe an event, occurrence, symptom that occurs and understand the meaning of a number of groups or individuals that come from certain social problems (Jayusman a Shavab 2020). The use of this method is very relevant to the research topic because researchers can find out in depth about forest management in Indonesia towards a sustainable environment. The source of data for this research was obtained by means of a desk study of secondary data through online mass media reports in the period 2020 – 2024 and previous studies both from photos, archives, documents, and reports related to the focus of research that have similarities with the topic of sustainable forest environmental management.

Table 1. Source from Online News

| Online Mass Media | Intensity |
|-------------------|-----------|
| Kompas | 10 News |
| Antara News | 10 News |
| Sindo News | 10 News |
| Detik | 10 News |
| Tribun News | 5 News |
| Tempo | 5 News |

(Source: Online Mass Media in 2020-2024)

The main data source comes from online mass media for the period 2020–2024, which consists of six sources. The online mass media Kompas contains 10 news articles, Antara News has 10 news articles, Sindo News has 10 news articles, Detik has 10 news articles, Tribun News has 5 news articles, and Tempo has 5 news articles. The data that has been collected is then analyzed using an interactive model by Miles and Huberman in a book (Giyono) with four stages of analysis. First, collect data related to the research topic. Second, data reduction is carried out to sort and map data according to the focus of the research. At this stage, Qualitative Data Analysis Software (QDAS) is used in the form of NVIVO 12 Plus tools using the crosstab feature. Third, presenting data from mapping to the focus of the research problem. Fourth, draw conclusions by describing the conclusions from the findings obtained in the research.

RESULT AND DISCUSSION

Arrangements regarding forest management are carried out both from the international and national worlds. From the international side, starting from the sustainable development meeting as a result of the Earth Summit in Rio de Janeiro in 1992, which is contained in Forest Principle 19 which contains directions for the development of forest resources holistically for all elements of the ecosystem for sustainability. The Forest Principle is not legally binding, but it is the basic norm for governance that must be carried out by the countries that sign it. Forest management by prioritizing sustainable environmental principles is the main focus of countries in the world. The reason is that currently many forest functions have been converted which threatens human safety in the world. Large-scale deforestation is currently still carried out by entrepreneurs, as a source of state foreign exchange, as well as a group of people as a source of livelihood (Nakita a Najicha 2022). Therefore, Indonesia is urged by forest management that must be addressed immediately.

The analysis in this study uses the crosstab feature to determine forest management in Indonesia based on a sustainable environment in accordance with the Sustainable Development Goals (SGD's) target No. 11 related to Sustainable Cities and Communities. Details can be seen in the image below:

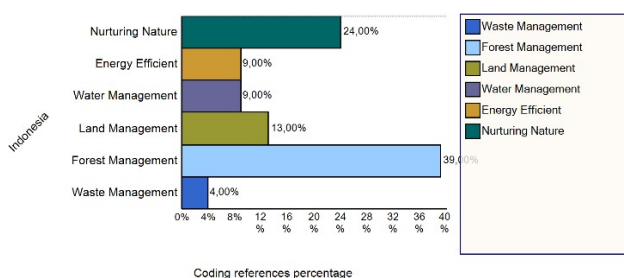


Figure 2. Crosstab Regulatory management in Indonesia
 Source: Nvivo 12 Plus by Author, 2024

The figure above explains that there are six efforts made by both the government and the community in forest management in Indonesia. Efforts include nature conservation with a percentage of 24%, followed by efficient energy use of 9%, water management by 9%, land management by 13%, forest management by 39%, and waste management by 4%.

Of the six forms of forest management in Indonesia, the nature conservation indicator is a fairly high form of management by ranking second. The reason is that nature management is a required action as stated in the 1945 Constitution. On the other hand, Indonesia has lost 23 million hectares of natural forest, which is comparable to 75 times the area of Yogyakarta Province. The lack of nature conservation resulted in Indonesia losing 1.1 million hectares of natural forests from 2000 to 2009 every year. This is getting worse where from 2013 to 2017 the loss of natural forests increased to 1.4 million hectares/year (Rahmadanty, Handayani, a Najicha 2015).

Indonesia has committed to Norway in the Deforestation and Forest Degradation, Plus Conservation (REDD) cooperation agreement on handling deforestation and forest degradation in Indonesian territory (Satwika 2020). Precisely in 2010 Indonesia signed a bilateral agreement to reduce emissions with Norway. The existence of this cooperation is to discuss new land use, create monitoring institutions, and enforce strict regulations and legislation. Norway has issued a budget of up to USD 1 billion to pay the Indonesian government for this cooperation. The result of this collaboration achieved success in 2019 where within ten years Indonesia received its first payment. This is constrained by the delay in implementation due to the merger of the Ministry of Environment and the Ministry of Forestry as well as the merger of the REDD+ management agency during the Joko Widodo administration.

Environmental management in Indonesia has undergone various policy changes, in addition to overlapping legal regulations. Environmental management in addition to dealing with aspects of nature conservation, is also related to aspects of the economy, investment, and sustainable development (Satwika 2020). In 2007, referring to data from States of the World Forests by FAO, every year the number of deforestation in Indonesia reached 2%. This condition is increasing in tandem with the increase in carbon emission (CO2) emission levels. It is proven that the increase in the rate of deforestation in Indonesia reached 2.83 million hectares in the period 1997 – 2000 which was initially only 1.8 million hectares in the period 1990 – 1907. Actually, government policies are a stage that cannot be abandoned in forest management. However, in the field, it is found that it is not optimal due to various interests such as local development, social realm, community management, and general wealth.

The lack of optimal forest management in Indonesia is indicated by the findings that the fragility of the forest resource asset security system, the weakness of forest institutions in the field, and the control of licensing administration by the government are factors that worsen forest management in Indonesia. Seeing the deteriorating

forest situation in Indonesia, the government issued a policy by forming a Forest Management Unit (KHP) organization to become litigated and work at the site level for the implementation of a sustainable forest management system from environmental, social, economic, and equitable functions to realize optimal and efficient sustainability. Although there is already FMU in Indonesia, in its implementation it is considered that there are still many limitations and are not ideal in carrying out its operation. These obstacles bring both external and internal problems in FMU Development.

Other factors that support the destruction of nature are the economic factors of the poor in the environment around the forest which then encourages farmers to encroach on the forest to make it private property. It was found that there are three factors that affect the management of protected forests in Indonesia, starting from the rent, the standard of living (economic) and education of people living in protected forest areas and the lack of planning for protected forest management, both the community and various parties involved. Another factor is the unclear legality of certificates or land status from the community for oil mining, sand, and protected forests. The last factor is the reason for the encroachment of protected forest land as a target place in fulfilling daily life (Rahmadanty, Handayani, a Najicha 2015).

In the regulation of freshwater in Indonesia's forest environment, it cannot be separated from peat ecosystems. Peat domes in Papua, Kalimantan, and Sumatra are the largest reservoirs for rainwater storage. Peat has a large enough carbon content which if dispersed or dried will release carbon that can threaten climate change (Risma 2018). If peat management can be done optimally, it can minimize carbon emissions. Because peat is the world's source of fresh water which has a great impact on climate change, and if it is damaged, it will affect millions of people. Organic matter such as plant residues and sparse that undergo drying cleanse peatlands, so that these organic materials are flammable in the event of burning. The construction of the canal was finally carried out, which in the end there was a shortage in the maintenance of the canal so that the canal was not in accordance with the original purpose as a place to accommodate excess water. In 2015, the United National Development Programme (UNDP) assessed that the national average index of forest management in Indonesia was 36 out of a scale of 1 – 100 which was categorized as still below ideal.

It is undeniable that one of the causes of low forest management in Indonesia is the lack of transparency in licensing forest use expenditures. In fact, from 1994 to 2015, Indonesia has converted more than 42 million hectares of forest into plantation forests, mining centers, and plantations by entrepreneurs. Another thing is also the ineffective conversion of plantation forests of 6.8 million hectares, 6.6% converted into plantations, and 2.9 million hectares into unlicensed mining land. On the other hand, Indonesia is also seeking permits regarding timber utilization concessions in the form of Timber Legality Verification (VLK) certification and Sustainable Production Forest Management (PHPL) certification to

reduce deforestation rates. In fact, oil palm forests are also not free from deforestation even though they have used the Indonesia Sustainable Palm Oil (ISPO) scheme. Although the area of 356 thousand hectares of oil palm forest has been verified by the Timber Forest Product Utilization Business (IUPHHK) permit.

The Reducing Emission from Deforestation and Forests Degradation (REDD) mechanism was developed to minimize forest degradation and reduce greenhouse gas emissions. Through the REDD program, poverty can be alleviated in the forest environment. However, in its implementation in Indonesia, clear laws and regulations have not been followed regarding the mechanism and allocation of program revenue. REDD was established to prevent forest degradation and deforestation in order to reduce emissions triggered at the Conference of Parties (COP) in Montreal, Canada. Preventing deforestation is considered more effective when compared to efforts to absorb carbon from the atmosphere through tree planting. The emission reduction mechanism by REDD was finally approved and explicitly stated in the Bali Road Map. The Bali Road Map is a document that was agreed in 2007 in Bali at the 13th climate change conference. REDD is assumed to improve health facilities, increase income, technical assistance services and education for communities around the forest environment. In the end, through the Minister of Forestry Number P.30/MENHUT-II/2009, the Indonesian government supports the implementation mechanism as a legal regulation (Risma 2018). Looking at various factors that arise due to the lack of good and correct nature management, the action of forest nature conservation in Indonesia is very far from perfect.

CONCLUSION AND RECOMMENDATION

Based on the results of the discussion, the researcher concluded that the concept of sustainable environment is a trend that needs to be carried out by Indonesia by maintaining and preserving forests for the future. Considering that Indonesia is ranked 164th out of 180 countries regarding environmental performance by The Environmental Performance Index (EPI) with a score of 28.20 points. This point is in the low category in forest environmental management. Forest management process in Indonesia is more likely to be an effort to preserve nature. In addition, Indonesia has also collaborated with Norway regarding the Deforestation and Forest Degradation, Plus Conservation (REDD) agreement regarding the handling of deforestation and forest degradation in Indonesian territory. Although various methods have been carried out, obstacles are still found in the fragility of the forest resource asset security system, weak forest institutions in the field, and the control of licensing administration by the government are factors that worsen forest management in Indonesia. So that the efforts made by Indonesia in managing the forest environment have not been optimal and are very far from perfect.

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