



Mitigation of Mangrove Forest Destruction in East Kalimantan Province

Hairun Jariah ^a, Akas Piningan Sujalu ^{a*}
and Lisa Astria Milasari ^a

^a University of 17 Agustus 1945 Samarinda, Jalan Ir. H. Juanda 80-Samarinda City, Province of East Kalimantan-75124, Indonesia.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/ajraf/2024/v10i2289>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/117556>

Original Research Article

Received: 16/03/2024

Accepted: 22/05/2024

Published: 25/05/2024

ABSTRACT

The present study was proposed to answer the problem of mangrove forest destruction through various policies of the East Kalimantan Regional government by using the literature study method followed up through Focus group discussion. As a result of this research, the implementation of policies carried out by the East Kalimantan Provincial Government can now be said to be successful, although there are still indicators that need to be improved, such as in the resource variable. Moreover, it was found that there were still problems that occurred with the management of the Mangrove Forest area in the previous government. There are recommendations from the results of this research to conduct a joint evaluation with the Central Government regarding the policy of private sector activity programmes, and there must be supervision after planting. Provisions in sectoral laws related to natural resources, apart from those that specifically regulate environmental protection as in Law 32/2009, are regulated in various forms.

*Corresponding author: E-mail: akaspibnaringansujalu@gmail.com, akaspiningansujalu@gmail.com;

Cite as: Jariah , H., Sujalu , A. P., & Milasari , L. A. (2024). Mitigation of Mangrove Forest Destruction in East Kalimantan Province. *Asian Journal of Research in Agriculture and Forestry*, 10(2), 97–101. <https://doi.org/10.9734/ajraf/2024/v10i2289>

Keywords: Policy implementation; regulations; mangrove forests; deforestation; mitigation.

1. INTRODUCTION

A typical mangrove forest grows along the coast or estuary of a river which is affected by the tides and is often found in coastal areas that are protected from waves and sloping areas in tropical and sub-tropical regions [1]. Mangrove forests are often called Bakau forests. The actual mangrove is only one of the plant species that make up the mangrove forest, namely the *Rhizophora* spp. which is the type that dominates the mangrove forest. The tropical and sub-tropical coastal vegetation community, which is dominated by several types of mangrove trees that are able to grow and develop in muddy coastal tidal areas [2].

A mangrove forest can be briefly defined as a type of forest that grows in tidal areas (especially on sheltered beaches, lagoons, river estuaries) that are inundated at high tide and free from inundation at low tide where the plant community is salt-tolerant. Some other terms for mangrove forests include: Tidal Forest, Coastal Woodland, Brackish Forest, and Mangrove Forest [1,3].

Mixed mangrove forests provide a range of ecosystem services, including nutrient cycling, soil formation, timber production, fish spawning grounds, ecotourism and carbon storage. Halting mangrove loss would be an effective climate change adaptation and mitigation strategy. Conservation of carbon-rich mangroves in the Indonesian archipelago should be a high-priority component of strategies to mitigate climate change [1,2,4].

Indonesian mangrove forest destruction is now increasingly distributed to various regions in the archipelago. The loss of mangrove forests is caused by conversion into plantation land, aquaculture, and areas for human habitation [5]. The extent of mangrove damage is relatively high, even though mangroves hold strategic functions such as nursery ground for aquatic biota, carbon dioxide gas absorber, abrasion buffer, source of livelihood for coastal communities, preventing seawater intrusion, decomposing pollutants, germplasm, food sources, tourist areas, education, and many more. According to the provisions to regulate management plans that include: strategic plan, zoning plan, management plan, and action plan [1,5,6].

Mangroves area in East Kalimantan Province is 364,254.99 Ha. Mangrove forested coastal areas are in the protected area spatial pattern plan which covers the area along the East coast and the estuaries of East Kalimantan rivers, namely the Mahakam River estuary, Sesayap River, Sebatik River, Sambaliung River, Kelay River, and Sebuku River, Balikpapan Bay, Tanjung Jumelai, Adang Bay and Apar, according to the Regional Regulation of East Kalimantan Province Number 1 of 2016 concerning the Regional Spatial Plan of East Kalimantan Province Year 2016-2036 [2,7].

Mangrove forest areas are not free from population pressure, so even mangrove areas that are often assumed to be remote locations, in fact remain one of the most densely populated locations [8]. Low-density residential areas (rural) can easily be found in all research locations. Some of the mangrove areas are even located near densely populated residential areas (urban) and there are also mangrove areas located near harbours, both large and small harbours (fish docks or fish auction sites) [9].

The purpose of this study was to investigate the problems that occur in mangrove forest areas continuously. Such problems have been occurring for a long time, caused by the inaccuracy of previous policies and the overlapping authority and selfishness of stakeholders. The goal of this research is to analyse the current policy implementation by the East Kalimantan Provincial Government in addressing the problem of mangrove forest destruction.

2. RESEARCH METHODS

This article was prepared using the literature study method by reviewing several related articles. Literature study is used as a data collection method by combining several research data listed in scientific articles that are relevant to the research to be carried out to obtain a problem solution. The process of solving problems found in further studies is carried out through Focus Group Discussion (FGD) activities.

3. RESULTS AND DISCUSSION

East Kalimantan Province has the third largest mangrove area in Indonesia, after Papua and

Riau. The East Kalimantan mangroves are under great pressure from land conversion resulting in damage to the area and its ecological functions. There are several things that cause damage to mangrove forests. Beginning from the conversion of mangrove forests as aquaculture, residential areas, the existence of residents who claim the mangrove forest as their property which eventually returned to change the function of the existence of the mangrove forest [10].

Overall identification of mangrove habitat in East Kalimantan in 1990 was 268,147 hectares. In the period 1990-2000 it decreased to 15% and decreased again by 5% in 2000-2019. All of this happened because of our ignorance about the importance of mangrove forests for life, including humans, and our lack of mastery of environmentally friendly mangrove forest management techniques [4,10].

Degradation of mangrove forests is undermining coastal communities' defences against the impacts of climate change, and increasing their risk of losing their homes and livelihoods. Efforts to protect coastal areas can be done by building local wisdom. So that mangrove restoration can be included in village programmes, so that residents can be directly involved in protecting mangrove ecosystems [2,11]. A loss of forest cover can be catastrophic on a local and global scale, with the permanent change from forested to non-forested areas caused by human activities being the main cause of deforestation [2,3,12].

Use of mangrove ecosystems can be categorised into use of the ecosystem as a whole (ecological value) and use of the products produced by the ecosystem (socio-economic and cultural value) [7,13]. A major issue regarding the influence or pressure on mangrove habitats stems from the human desire to convert mangrove forest areas into areas for housing development, commercial activities, industry and agriculture [4,7].

The condition of the environment, especially in areas where exploitative economic activities are carried out, has not received adequate protection from state administrators. Convenience of investment in the utilisation of natural resources is directly proportional to the fact of neglecting users who do not obey the law [1,3,14]. Governments practice the transfer of responsibility for protecting the environment to investors after the granting of licences or

contracts, causing harm to Indonesia in the future [15].

Natural resource management environmental cases are limited to law enforcement efforts that are not enlightening and are repeated from time to time. orientation of criminal law enforcement in the natural resources sector has been carried out based on various available legal qualifications, but corruption criminal events still occupy the most important portion measured from various perspectives because they are related to state financial losses, reduced value of natural resources themselves, and even leave ecological risks in the future [14,16].

A. Protection and Law Enforcement of Mangrove Areas

One of the most important things in coastal management is Law Enforcement. Regulations have been issued with the aim that coastal management can be carried out in an integrated manner. However, in implementation, regulations are often violated and violations are not followed by strict sanctions or penalties, even though they are explicitly stated in the rules. Monitoring by the authorities (predominantly the government) is not carried out. Law enforcement needs to be carried out in various ways and efforts. Methods and efforts can include [15,16]:

- a. Socialisation of laws and regulations relating to coastal management to all stakeholders.
- b. The substance of the rules and sanctions need to be socialised in more detail. For example, by installing rule boards and sanctions in strategic places.
- c. Shock therapy is needed, for example by applying sanctions, fines, or maximum penalties from existing regulations. This is intended so that stakeholders become deterrent and want to obey the applicable rules.
- d. There is a need for a supervisory institution attached to the agency. This institution will oversee the management of the beach both internally and externally.
- e. Because of these complex issues, good collaboration is needed between institutions that determine water quantity and quality and law enforcement institutions.
- f. Implementation of law enforcement is carried out in stages. Penguatan terhadap efek pengancam (deterrence effect)

This is carried out in the form of action to strengthen sanctions, especially through merging with criminal law. Sanction Direction of East Kalimantan Provincial Regulation No. 1 Year 2016 is regulated in Article 59 paragraph:

1. Direction of sanctions as referred to in Article 43 paragraph (2) letter d is a reference to the imposition of sanctions for violations of:
 - a. space utilisation that is not in accordance with the spatial structure plan and spatial pattern plan of the region;
 - b. violation of the provisions of zoning regulation directives;
 - c. space utilisation without a space utilisation permit issued under the RTRWP;
 - d. space utilisation not in accordance with the space utilisation permit issued under the RTRWP;
 - e. violation of provisions stipulated in the requirements of a space utilisation permit issued under the RTRWP;
 - f. space utilization that obstructs access to areas that are required by laws and regulations declared as public property; and
 - g. utilization of space with permits obtained by improper procedures.
2. Any violation of the Provincial Spatial Plan stipulated by this Regional Regulation will be subject to administrative sanctions, management sanctions Administrative sanctions imposed on violations of spatial planning as referred to in paragraph (2), include:
 - a. written warning;
 - b. temporary suspension of activities;
 - c. revocation of licence;
 - d. cancellation of permit and demolition;
 - e. site closure;
 - f. sanction of space function restoration; and
 - g. administrative fine sanctions.
 - h. Criminal sanctions as referred to in paragraph (2) shall be determined in accordance with the provisions of the applicable laws and regulations.

For further provisions regarding the imposition of sanctions, refer to the relevant applicable laws and regulations. As a concrete example of the damage to mangrove forests due to management that does not heed ecological impacts, the relevant parties should take firm law

enforcement actions in accordance with applicable regulations. Because the act of destroying the mangrove ecosystem has violated various regulations [13].

The first rule violated is Article 35 (e) and (f) of Law No. 27/2007 on the Management of Coastal Areas and Small Islands, which reads 'In the utilisation of Coastal Areas and Small Islands, every person is directly or indirectly prohibited: (e). Using means and methods that damage mangrove ecosystems that are not in accordance with the characteristics of Coastal Areas and Small Islands; (f). Converting mangrove ecosystems in cultivation areas or zones that do not take into account the sustainability of the ecological functions of coastal and small islands [14,15].

According [15,16], the violators may be subject to sanctions in accordance with the provisions of Article 73 Paragraph (1) Letter (b) which reads 'Shall be punished with imprisonment for a minimum of 2 years and a maximum of 10 years and a fine of at least IDR 2 billion and a maximum of IDR 10 billion for every person who intentionally: (b). Using means and methods that damage mangrove ecosystems, converting mangrove ecosystems, cutting mangroves for industrial and residential activities, and/or other activities as referred to in Article 35 letter e, letter f, and letter g.' Second, violating Article 22 (1) of Law 32 of 2009 concerning PPLH which reads "Every business and/or activity that has an important impact on the environment must have an Environmental Impact Analysis (AMDAL) document" [17].

4. CONCLUSION

According to the description above, environmental protection through administrative law instruments has become part of the normal operation of the legal system in Indonesia. Several provisions in the sectoral laws i by the East Kalimantan Regional Government related to natural resources, apart from those that regulate environmental protection in various Regional Regulations. The government's implementation of policy activity programmes does not only involve the government and the community, but also involves the private sector and non-governmental organisations (NGOs) as a form of participation in realising forest sustainability and improving the economy of communities in mangrove forest areas.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. FAO. Global ecological zones for FAO forest reporting: 2010 update. Forest Resources Assessment Working Paper No. 179. Rome; 2007.
2. Fitria G, Dwiyanoto G. Mangrove ecosystems and global warming mitigation. *Jurnal Ekologi, Masyarakat & Sains*. 2021;2(1);29-35.
3. Jacob Phelps, Bernadeta Hariyanti, Anna Christina Sinaga, dan Ahmad Dermawan. Environmental valuation in Indonesia: Implication for forest policy, legal liability and state losses estimates: 6p. CIFOR Brief No. 31, CIFOR; 2014. Available: <http://dx.doi.org/10.17528/cifor/005288>
4. Kolstad, Ivar, Tina Søreide, Corruption in natural resource management: Implications for policy makers, *Resources Policy*. 2009;34(4) 214–226. Available: <https://doi.org/10.1016/j.resourpol.2009.05.001>
5. van Bemmelen RW, de Bouter EA. The Geology of Indonesia, 2nd edition (A reprint of the original 1949 edition), The Hague; 1970.
6. NRG1 Reader. The resource curse the political and economic challenges of natural resource wealth. 2015;6.
7. Rokhmin Dahuri, Jakub Rais, Sapta Putra Ginting, Sitepu MJ. Integrated processing of coastal and marine resources. *PT Pradnya Paramita*. Jakarta. 2008;208.
8. Pagiola S. Land use change in Indonesia. In: *Indonesia: Environment and natural resources management in transition*. Jakarta: Departemen Lingkungan Hidup. 2001;135.
9. Ahmad Dwi Setyawan, Kusumo Winarno. Direct utilisation of mangrove ecosystems in central java and surrounding land use; Damage and restoration efforts. *Biodiversitas Journal of Biological Diversity*. 2006;7(3):20-27. Available: <https://doi.org/10.13057/biodiv/d070318>
10. Aswin Rahadian, Lilik Budi Prasetyo, Yudi Setiawan dan Ketut Wikantika. Historical overview of Indonesian mangrove area data and information. *Media Konservasi*. 2019;24(2):163-178. Available: <https://doi.org/10.29244/medkon.24.2.163-178>
11. Darmansyah O, Erwianto E. Perception and community participation in mangrove forest conservation in Muara Pantuan Village, Anggana Sub-district, Kutai Kartanegara Regency. *Jurnal Hutan Tropis*. 2018;6(2):137-144.
12. Salzman, James, Barton H. Thompson, Jr, *Environmental Law and Policy (Concepts and Insights)*, Foundation Press; 2003.
13. Wahyu Prawesthi. Political forestry in environmental law enforcement and control for disaster reduction. *Jurnal Kajian Politik Dan Masalah Pembangunan*. 2016;12(1);1-6.
14. Mimi Salminah, Iis Alviya. Effectiveness of mangrove management policy to support climate change mitigation in East Kalimantan Province. *Jurnal Analisis Kebijakan Kehutanan*. 2019;16(1):18-30.
15. Wibowo BA, Boesono H, Aditomo AB. Policy analysis of fishing activities of karimun jawa fishermen in jepara regency. *Jurnal Saintek Perikanan*. 2012;25(1):41-48.
16. Purnobasuki H. Threats to mangrove forests in Indonesia and strategic measures to mitigate these problems. *Bulletin PSL Universitas Surabaya*. 2011;25:3-6.
17. Sondak, Calvyn FA. An estimation of blue carbon sequestration potential by North Sulawesi Mangrove Forests. *Journal of Asean Studies on Maritime Issues*. 2015;1(1):24-29.

© Copyright (2024): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/117556>