



# Forestry: Mind to reduce forest and land fire natural disasters

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## ABSTRACT

**Background:** Forest and land fires, especially on peatlands that often occur in Indonesia, have a very large negative impact, both for the environment and for society. Enforcement of civil law to obtain compensation for damages to the environment and for the community must be obtained. The use of the basis of civil liability through absolute responsibility can be carried out for activities and/or businesses that are within a peat ecosystem or have an impact on peat ecosystems. **Methods:** By using literature review; **Finding:** This article finds that forest fires in Indonesia are natural disasters that occur consistently every year. The Indonesian government's interventions in suppressing forest fires are often carried out when massive fires have already occurred on a massive scale. When it occurs on peat land, forest fires become difficult to extinguish because of the characteristics of burning beneath the soil surface which is better known as the phenomenon of peat smoldering. **Conclusion:** Thus, these conditions challenge the management of forest fires in Indonesia to prioritize preventive principles in its implementation, one of which is by paying attention to the physical condition of peatlands. Peat management has been carried out since the New Order government era until the current government. **Novelty/Originality of this article:** Various policies, programs and regulations have been issued by the government in response to the problems surrounding peatland management, some of which have failed, are right on target, or even need to be reviewed.

**KEYWORDS:** forest fires; peatlands; natural disasters; government.

## 1. Introduction

Indonesia contributes 47% of the world's tropical peatland area and is the fourth country with the largest peatland in the world. The area of peatlands in Indonesia is estimated at 20.6 million hectares or around 10.8% of Indonesia's land area. Peatlands in Indonesia provide many benefits because they provide forest products in the form of wood and non-timber, store and supply water, store carbon, and are habitats for biodiversity with various types of rare flora and fauna that are only found in this ecosystem. Peatland is a unique and fragile ecosystem, because this land is in a swamp environment, which is located behind a river embankment. In the last twenty years or so, it is estimated that the conversion of peatlands into agricultural land, oil palm plantations and pulpwood has damaged peatlands with all their ecological functions.

Approximately 120,423.8 million hectares (Ha) of Indonesia's land area is claimed as a forest area, which contains various natural resources. The main objective of managing forest resources as contained in Article 33 paragraph (3) of the 1945 Constitution is for the greatest prosperity of the people. 2 To manage forests, the Government involves business

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entities. Profits from this forestry sector business should be used for the benefit of the people, including the fulfillment of human rights. The government must also provide opportunities for the people to manage forests. Unfortunately, the opportunity for forest management by the people is sidelined by the interests of business entities which in fact often lead to conflicts over community territorial claims over forest areas designated or determined by the Government, including the granting of management rights to business entities.

Peatlands, including the vegetation that grows on them, are part of natural resources that have the function of conserving water resources, reducing floods, preventing seawater intrusion, supporting various kinds of biodiversity, and controlling climate, through their ability to absorb and store carbon (Wahyunto & Subagjo, 2004). Peatlands in Indonesia provide many benefits because they provide forest products in the form of wood and non-timber, store and supply water, store carbon, and are habitats for biodiversity with various types of rare flora and fauna that are only found in this ecosystem. The Indonesian government has established policies for controlling land and forest fires by issuing several regulations including (1) Law Number 41 of 1999 concerning Forestry, (2) Law Number 39 of 2014 concerning Plantations, (3) Law Number 32 of 2009 concerning Environmental Protection and Management, (4) Government Regulation Number 4 of 2001 concerning Control of Environmental Damage and/or Pollution Relating to Forest and/or Land Fires, (5) Government Regulation Number 45 of 2004 concerning Forest Protection, as well as (6) Regulation of the Minister of Forestry Number 12 of 2009 concerning Forest Fire Control. Forest fire control referred to in Forestry Minister Regulation number 12 of 2009 is all efforts, prevention, suppression, handling after forest fires and rescue.

The method used in this paper is a literature review study. The source that was carried out in compiling this literature review was through Google Scholar. And the type of method that I took was a study from a journal which was library research, namely a library research that used a qualitative paradigm with a phenomenological, sociological, and ethical approach. This approach is used to examine the phenomena and conditions that occur in Indonesia. The method used is to collect several literature review journals with the theme of forest and peatland fires, and environmental ethics using supporting sources such as news about forest fires. Comparing the performance of handling forest and land fires in the era of President Susilo Bambang Yudoyono and President Joko Widodo.

## 2. Literature Review

### 2.1 Natural disaster and forest fire

Prevention and management is an important matter that must be carried out by the government through institutions that have been established both at the central government and provincial regional governments and city/regency governments. In accordance with the mandate of Law Number 23 of 2014 concerning regional government that the regulation states that the distribution of authority for the provincial and regency regional governments is one of them in disaster management. One form of natural disaster is forest fires.

Fires Forest fires in Indonesia do not only occur on dry land but also on wetlands such as peat land/forest, especially during the dry season, when these wetlands experience drought. Irreversible drying occurs and the peat changes its character like charcoal, causing the peat to no longer be able to absorb nutrients and retain water. Although various studies on forest fires have been carried out, not much progress has been made in overcoming the problem of fires, especially fires in forests and land globally. According to the records of the Ministry of Environment and Forestry, forest and land fires in Indonesia have continued to increase from 2014 to 2019.

In 2019 the province of Central Kalimantan was in first place with forest and land area reaching 134.227 ha. The second place is the province of West Kalimantan with an area of forest and burned land reaching 127.462 ha. And in tenth place is the province of West Nusa Tenggara with an area of forest and burnt land reaching 22.046 ha. The total land burned

from 2014—2019 was 857.755 ha. Problems arising from forest fires greatly affect various sectors of life such as disruption to daily life activities, transportation barriers, ecological damage, decline in tourism, political, economic impacts and health problems.

## *2.2 Peatland as well as the causes of forest and peatlands*

Fires that occur in peatlands will slowly but surely eat away the organic matter beneath them and the gases emitted from the burning can contribute to global climate change in 1997. Fires Forests and land in Indonesia are generally 99.9% caused by humans, either intentionally or as a result of their negligence. While allowing the rest is due to nature. The cause of fires caused by humans is (1) vegetation burning, namely fires caused by fires originating from intentional but uncontrolled burning of vegetation resulting in jumping fire; (2) activities and utilization of natural resources caused by fire originating from activities during the utilization of natural resources; (3) land conversion caused by fire originating from land preparation activities for agriculture, industry, construction of roads, bridges, buildings, and others; (4) construction of canals on peatlands. Channels are generally used for transportation of felled timber and for irrigation. Canals that are not equipped with adequate water control gates cause the drains to separate from the peat layer, causing the peat to become dry and flammable.

The impact of forest and peatland fires has caused environmental damage, disruption to human health, and socio-economic destruction of the surrounding community. The first is disturbances to human health. Forest fires that occurred in Indonesia in 1997 caused smoke to cover 11 provinces, especially in Sumatra and Kalimantan, as well as neighboring countries such as Singapore, Malaysia and the Philippines. The impact has caused various diseases such as respiratory disorders, asthma, bronchitis, pneumonia, skin and eye irritation. The second is changes in socio-economic values. The impact is the loss of people's sources of livelihood, especially for those who still depend on forests such as farming, farming, livestock and hunting. Third is the degradation of environmental conditions. Changes in the chemical properties of peat. The impact of fire on the chemical properties of peat is also determined by the level of its decomposition and the availability of fuel on the surface which will have a heating effect as well as the amount of mineral-rich ash produced by burning. The changes that occur are, immediately the occurrence of a fire is characterized by an increase in pH, total N content, phosphorus content and total base content (calcium, magnesium, potassium, sodium) but there is a decrease in C-organic content.

## **3. Results and Discussion**

Environmental ethics is a human action regarding good and bad judgments on the environment. Environmental ethics usually originates from an assessment of one's perspective on the environment. In this literature review, it is explained using the theory of environmental ethics, namely the theory of Anthropocentrism, Neo-anthropocentrism, Ecocentrism and Biocentrism. Because, the theory has different opinions related to interpreting the application of the environment and everything in it (Rusmadi, 2016). The environmental ethics theory of anthropocentrism and neo-anthropocentrism considers humans to have the highest degree of ecosystem, living and non-living things. This theory considers that only humans have a value that plays an important role in life in this world, whereas other than humans have no role in life, if other than humans have value, then that value is a benefit that humans can enjoy again

Environmental ethics, ecocentrism theory considers humans has a degree that is not superior to other members of the ecosystem. The relationship between humans and other members of the ecosystem is a balanced or equal relationship, and nature also has a value that exists within nature itself. The biocentrism paradigm is an environmental ethical theory that has a perspective that denies anthropocentrism and neo-anthropocentrism theory which assumes that only humans have a value in this world, while the biocentrism perspective is based on a noble morality, both in humans and in other creatures.

### 3.1 Management of forest and land fires in the era of President Susilo Bambang Yudhoyono and Joko Widodo

Called forest fires an extraordinary crime, because forest fires polluted oxygen, which is the source of human life. More than 90% of forest and land are deliberately burned. One of the worst karhutla phenomena during the SBY era was the forest fires in Riau. In this matter, the President of the Republic of Indonesia Susilo Bambang Yudhoyono (SBY) gave the Task Force (*Satgas*) Integrated Operations for Haze Disaster Management three weeks to extinguish the fire and smoke, starting from 14 March 2014 to 4 April 2014. Through this action, the area of land fires and forest that was successfully extinguished by the Land Sub Task Force and PRC PB on 14 March 2014 – 1 April 2014 covering an area of 21,541 ha (74 points).

Jokowi emphasized to his staff the importance of prevention to prevent fires from growing and spreading like now. To carry out the extinguishment, Jokowi has ordered the addition of 5,600 troops. However, Jokowi's step down to the field to monitor the condition and handling of karhutla is considered not to solve the problems that occur almost every year. Jokowi is like a 'disk mat' alias not moving in overcoming forest and land fires.

### 3.2 Handling forest and land fires in other countries

The management of forest and land fires in Indonesia in the last 20 years is still considered ineffective even though the government has made various efforts such as issuing laws, arresting perpetrators of forest and land burning. However, the results are minimal because of the vast territory of Indonesia and various other factors that make this problem difficult to overcome. As for the proven ways to deal with forest fires in various countries.

America is one of the countries that often experience forest and land fires, the way the government has done to deal with this disaster is: widening the planting distance so that the rate of forest and land fires can be reduced, installing fire extinguishers in residential areas close to the forest, using fire-resistant building materials, and deploying many military troops to extinguish forest and land fires (Wijayanti, 2015). Besides that, Brazil is also a country that often experiences forest fires, but it is different from America, which is adept at dealing with forest fires. The Brazilian government actually acted very slowly and closedly so that forest and land fires in the Brazilian Amazon forest became widespread and difficult to control, even though the Amazon forest is the lungs of the world. So, forest fires that occur can make world climate change and become a global disaster. Brazil must quickly deal with forest fires and not be closed-minded so that this problem can be resolved quickly (Utomo, 2019). From the example of this country, we can conclude that Indonesia must follow the example of America in dealing with forest and land fires in America so that cases of forest and land fires can be reduced and overcome. by educating the public in dealing with forest and land fires and supervising companies so that forest fires can be controlled.

## 4. Conclusions

Natural resources in the world are very diverse in number and type. One of these natural resources is peatland resources. This one resource is very important considering that all human activities are carried out on it. Therefore, management and types of use are not arbitrary in order to provide good benefits for humans.

Forest and land fires in Indonesia are a public problem that must be dealt with in a comprehensive manner because they are not only related to the economy but also ecological and social. In this literature review, we can find out the causes and effects of forest and peat fires. As well as handling forest and land fires in the last two decades, namely President Susilo Bambang Yudoyono and President Joko Widodo.

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