



Impact and risk management of wildland fires

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ABSTRACT

Background: Forest fires are increasingly common and hit Indonesia almost every year. The impacts experienced by the community, such as the haze that affects human health, especially in the provinces of Riau and Kalimantan, are areas where forest fires frequently occur. **Findings:** Another impact is the disruption of flights to and from Riau and Kalimantan provinces. Not only that, forest fires also cause various losses, especially for public health, especially upper respiratory tract infections (ARI), both in Indonesia and neighboring countries, so that forest fires cause protests from neighboring countries such as Malaysia and Singapore. **Methods:** Data collection method that prioritizes legal research with various legal materials through the results of a review of literature sources in the form of documents, books, journals, magazines, newspapers related to legal materials. **Conclusion:** Forest fires in Indonesia are a big problem. Therefore, risk management is needed for the problem of forest fires and legal protection which plays an important role. In general, law enforcement can be used to solve environmental problems in relation to Law Number 32 of 2009 concerning environmental management and protection.

KEYWORDS: forest fire; risk management.

1. Introduction

Fire has been used for a long time (500,000 years ago), but its use was only studied as early as 20,000 years ago (Johnston 1970). Many writings are collected from previous experiences that show how fire is used and how fire is used to this day. One example of the use of fire from the past to the present is the use of fire by indigenous Australians. Fire is used to clear dense vegetation to clear roads, revive edible plants, and use fire retardants around tents. The risk of forest fires increases dramatically when forests are converted to rubber and oil palm plantations and HTI, and of course logging occurs in natural forests, which causes canopy clearing and cover crops to dry up. Agricultural evidence suggests that wildfires easily started in secondary forests damaged by previous logging. Logging has been shown to increase the risk of fire and destruction (Mackie 198). The presence of road connections makes the area open for entry and participation by migrants and local residents. In addition, the influx of logging companies (HPH) leads to a buildup of timber (derived from unused timber).

The Indonesian state is currently facing serious pollution and environmental damage that is increasing day by day. Environmental issues continue to be an important

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responsibility because they affect the quality of life in the future. The utilization of natural resources and the environment has led to a decline in the quality of the environment, especially natural resources. Extensive natural damage such as marine ecosystems, destruction of most of the forests that are the lungs of the world continuous floods, landslides and of course stillmore One of the most frequently experienced consequences in this region of Indonesia is forest fires, where the problem of forest fires increases almost every year.

The Ministry of Environment and Forestry (KLHK) noted that the area of forest and lahan (karhutla) fires in Indonesia was 358,867 hectares (ha) in 2021. This number increased by 20.85% compared to 2020 which was 296,942 ha. Errors related to environmental problems in forest fires are caused by several factors such as economic problems, individual or group interests, lifestyle and more importantly, weak existing legal and regulatory systems and weak forest fires. Therefore, unlawful officials must be able to protect habitats in the event of forest fires in Indonesia. Law as a means to reflect the value system that society believes to be an institution in everyday life includes personal, social, national and state life to be controlled. The articles contained in The Constitution No. 32 of 2009 can be used as guidelines to pay more attention to the importance of implementing the Law in various environmental problems, especially forest fires. The awareness of residents to maintain and preserve the environment is one of the foundations for implementing sustainable development in the future.

1.1 Impact of Wildfires

The fires have many of the effects of losses suffered by communities around the forest, neighboring countries and governments as well. The impact is [a] Economic Impact of the State: The budget issued by the government is getting bigger because of the land blackout which is very difficult to do. Even artificial rain with salt in clouds that are predicted to occur in areas where fires occur is not in accordance with the target of prediction due to the influence of wind speed factors and climate that easily change suddenly. The losses here include losses to agriculture and forestry, transportation, trade, industry, tourism and other industries. Part of the loss is the damage and direct loss of agriculture, forestry, apartments, infrastructure, and the cost of dealing with fire. The huge economic damage produces indirect effects of disturbances such as disruption of air, sea and land traffic through smoke. The impact on local income growth will affect economic growth and the government's efforts to eradicate poverty in the region. [b] Health Impacts: Burning forests and peatlands has a serious impact on the quality of life of indigenous peoples around forest and peatland fire areas. The smoke caused by forest fires automatically interferes with daily human activities, especially for those who are doing activities outdoors, even the limited visibility of smog kibat in traffic is also disturbed by the presence of a fairly thick smog because of the vulnerability of accidents that may occur. In order to maintain public health, several agencies have temporarily stopped activities such as sekolah diliburkan, markets and offices are also stopped which reduces social interaction between community residents in the area around the forest fire area. Smoke pollution from forest fires includes a mixture of gases, particles, and chemicals from the incomplete combustion of organic matter (litter, plant debris, etc.) present in forests and lands. The mixture of gases, particles and chemicals in smog has many health effects. Wildfire smoke causes rapid -acute irritation of the eyes, hidung, and throat. Usually, this causes symptoms such as sore or runny eyes, irritated nose and throat, and can increase the development of acute respiratory infections (ARI). These adverse effects threaten the health of each person. Fog from forest and land fires is particularly vulnerable to health diseases, especially babies and children who fall ill. [c] Bilateral Relations With Neighboring Countries: Recent forest and peatland fires in several parts of Indonesia have become a serious concern both nationally and internationally. The current smoke problem is not just a trivial matter, just like burning charcoal or burning garbage in the yard of the house. Smoke can now be an indicator of understanding ethical values and an indicator of adherence to applicable laws. Forest and

peatland fires that occur almost every year have become a routine agenda every year. The impact of the fire was not only felt by the people of Indonesia but also in several neighboring countries such as Singapore and Malaysia. The smog easily moved with the help of winds to other countries and became cross-border air pollution. Smog pollution that crosses national borders in the Southeast Asian region is a role model of land clearing by burning has a significant impact on health and economy on the member states of the Association of Southeast Asian Nations (ASEAN). While impacts related to carbon emissions, ecological and biodiversity disturbances have a wide effect on passing through areas outside Southeast Asia.

1.2 Risk Management: Forest and Land Fire Disaster Handling Management

Condition assessment is the first thing to do for forest and land fire disasters because the purpose of carrying out this condition assessment is to see the current conditions at the incident location so that further handling can be carried out appropriately and this condition assessment is carried out continuously during the disaster emergency response so that conditions are current. In the field / location of the incident can continue to be known. This condition assessment is carried out to determine where the location points are/determine the range of the disaster location, measure the distance of the incident location to roads and settlements, see whether there is a water source around the disaster site, monitor how many points of fire, see the visibility. [a] Determining the Range of Land and Forest Fire Disaster Locations, [b] Hotspot Detection in Forest and Land Fire Disasters, [c] Development of Air Pollution Standard Index and Visibility during Forest and Land Fire Disasters. Extinguishing Forest and Land Fire Disasters, [a] Forest and Land Fire Extinguishing Operations: Not all forest and land fires can be resolved by land route, there are several cases of forest and land fires which cannot be handled by land route blackouts, [b] Airway Blackout Operations: Water Booming, this is one of the methods used in extinguishing efforts carried out on air lines which are carried out using helicopters. Weather Modification Technology, this artificial rain is carried out by the National Disaster Management Agency (BNPB) together with the Agency for the Assessment and Application of Technology (BPPT) where this artificial rain does not necessarily work and also depends on whether or not Cumulus clouds have great potential for rain, This artificial rain is done by adding sodium chloride (NaCl) to the clouds.

2. Methods

Data collection method that prioritizes legal research with various legal materials through the results of a review of literature sources in the form of documents, books, journals, magazines, newspapers related to legal materials. The study materials in this article are in the form of secondary data, namely data derived from laws, legal research results, law enforcement in environmental issues in forest fire cases, and sustainable development. This article is also supported by various sources of previous research literature. For the data in this article is taken from several sources such as the KLIK statistical system and so on.

3. Result and Discussion

The Indonesian government has made every effort to save Indonesia from forest fires, has provided various tools, both structural in nature in the form of providing institutions and organizations that are given the responsibility to control cases of forest and land fires, as well as legal instruments in the form of regulations as outlined in the regulations. Written law. This written rule is important as a basic guideline in structured and directed operations. With the current regulations related to forestry, it should not be understood only as a legal aspect. But it must also be considered in the sociological aspect as well. The role of

institutions and institutions in controlling forest fires is not static, but must be able to develop through a social process of learning and adaptation, which can expand socio-ecological resilience to accommodate unexpected needs such as the increased danger of forest fires.

Smoke from forest and land fires contains harmful substances. The burning of forests and land in Indonesia is not the first time it has happened, but it has happened in previous years. In this regard, the government must implement strategies mainly to manage health impacts, since forest and rural fires occur almost every year when the long dry season arrives. ARI surveillance includes prevention and control measures. Control is carried out to reduce the risks caused by these impacts. Therefore, the government is expected to be able to reduce the development of health problems due to forest fires, because the health impacts are very visible and real. As a result of forest fires, the victims of community forest fires are needed, therefore proper law enforcement is needed in order to overcome environmental problems in forest fire cases. In this case, in addition to the existence of regulatory law enforcement, there needs to be assistance from the government and officials to be able to provide protection to the environment so that the problems that occur after the year can be overcome properly.

Law can be created as a means to become a container that will regulate the rights and obligations of citizens as legal subjects to be able to perform their rights and obligations properly and not harm others. In this case, there are several rules for carrying out an activity so that the law can be realized in an orderly and orderly manner. The law also serves to be able to provide something that will later become a driver in development, namely to make society more advanced than the previous one so that they can think logically, rationally, and critically (Bram Deni, *Environmental Law*, Bekasi, Gramata Publishing: 2014, p. 3)

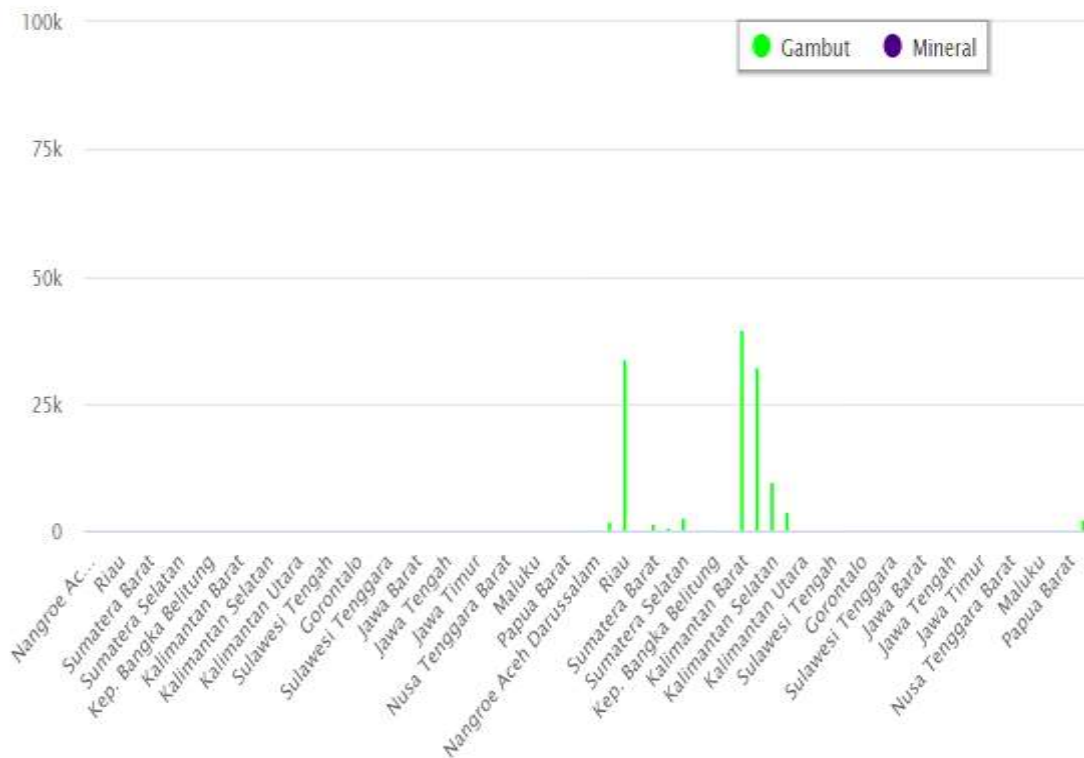
More specifically, the law on environmental control and protection is actually regulated in Law-Undang Number 23 of 1997. Environmental management 19, but it is now updated and refined. Law Number 32 of 2009 concerning Environmental Protection and Management. The existence of this law can be used as a guideline to get more and more strengthening of law enforcement where the law focuses more on plans and more serious prosecutions. In addition, the law also explains the purpose of the environment in accordance with Part 2 article 3 concerning Environmental Protection and Management of Hidu p. This should be applied going forward to do law enforcement. Environmental problems that can be addressed then correspond to the supervision and supervision of various threats, deletions, criminal and civil applications. Constitutional Law Enforcement Provisions with Regulations Used as Guidelines environmental issues can be addressed by individuals, groups, communities, Also for the public.

The Ministry of Environment and Forestry (KLHK) noted that the area of forest and land fires (karhutla) in Indonesia was 358,867 hectares (ha) in 2021. This number increased by 20.85% compared to 2020 which was 296,942 ha. Forest and land fires last year occurred in East Nusa Tenggara (NTT), which was 137,343 ha. This happened due to the burning of meadow land, shrubs, and dryland farming mixed with shrubs. Its position is followed by West Nusa Tenggara with a forest and land fire area of 101,173 ha. In the province, fires are dominated by dryland agriculture, savannas/grasslands, and shrubs. Forest and land fires occurred in West Kalimantan recorded as much as 20,590 ha. There are also forest and land fires in Papua and East Java covering an area of 15,979 ha and 15,458 ha, respectively. Looking at the trend, forest and land fires in Indonesia tend to fluctuate from year to year. Throughout 2016-2021, the most severe forest and land fires occurred in 2019 as many as 1,649,258 ha, an increase of 311% on an annual basis.



(Ministry of Environment and Forestry KLHK, 2021)

Forest and land fires are currently on the rise in several areas of Kalimantan and Sumatra in 2019 quite extensively, covering 328.72 hectares, almost matching the forest and land fires of 2015, which were the worst forest fires in the history of karena caused quite a lot of casualties.



(Statistical Information System KLHK, 2019)

Forest and land fires (karhutla) in several regions of Kalimantan and Sumatra in 2019 were quite extensive, covering 328.72 hectares, almost matching the 2015 forest fires, which were the worst forest fires in history because they caused quite a lot of casualties. (Center for Health Crisis, 2016; CNN Indonesia, September 18, 2019).

Reports from the BNPB Information Center and the Provincial Health Office of setempat regarding communities affected by ISPA that in some provinces of Sumatra Island:

City	Toddler	Overall Number
South Sumatra	2.188	291.807
Jambi	478	63.554
Riau	-	34.000

Reports from the BNPB Information Center and the local Provincial Health Office regarding communities affected by ISPA that in some provinces of Kalimantan Island:

City	Sum
West Kalimantan	189.695
South Kalimantan	67.293
Central Kalimantan	40.374

(antaranews, September 14, 2019; Compass, September 23, 2019; Compass, 24 September 2014)

4. Conclusion

In Indonesia, the a limited successive successive reform governments since 1998 in addressing the fire and smoke problem have become emblematic of a more general government failure. Although administrative reforms addressed deficiencies in regional firefighting capabilities, they were much slower to address the underlying political-economic causes of illegal burning for the development of commercial plantations. The underlying political-economic causes of problematic burning in Kalimantan and Sumatra are exacerbated by the lack of effective political authority and will to implement fundamental reforms for a just solution to forest and land allocation problems associated with fires and haze (Project FireFight South East Asia, 2003; Tan, 2005; Wakker, 2005).

In the case of forest fires, environmental protection measures must be implemented optimally to create a good environment. Special and maximum attention should be paid to the supervision of environmental regulations, especially regarding forest destruction. Environmental law enforcement can increase people's legal awareness to better comply with existing regulations. The impact is huge because there are elements that are interrelated and cover the entire content of the legislation. It can be said that the enforcement of environmental laws and regulations must be able to provide a deterrent effect to parties who cause damage and environmental pollution so that the purpose of Law Number 32 of 2009 can run as expected.

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