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Synergy Between Government and Community in Preventing Savanna Fires: An Environmental Law Review

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Abstract: Forest and grassland fires in East Sumba Regency have continued to increase to catastrophic levels. From the beginning to the middle of 2025 alone, there have been more than five cases of savanna fires in several different villages. To date, there has been no court ruling or action by the local government in East Sumba Regency to impose sanctions on those responsible for burning savanna grasslands. This study employs a normative-empirical legal method. The approaches used in this study include the statute approach to analyse relevant legal provisions and the socio-legal approach to assess the application of these provisions in practice through interviews and observations. Savanna fires in Sumba are prohibited by environmental law, but due to weak enforcement, the justification of local wisdom, and the difficulty of proving guilt, almost all cases end without sanctions, even though thousands of hectares of savanna are burned each year, causing harm to the community. Local governments are required to establish technical regulations for savannas due to their unique and vulnerable nature, whether in the form of district regulations or village regulations. The best approach is a combination of education, regulation, conservation, and law enforcement.

Keywords: Fire; Savanna; Sumba

1. Introduction

Savanna is a type of grassland ecosystem found in lowlands and highlands, where the community consists of several trees and shrubs that grow unevenly and the undergrowth is dominated by grasses (Sutomo, 2016). Savannas often form in areas with long dry seasons, one example being in East Nusa Tenggara Province, Indonesia. East Sumba Regency is one of the regions in East Nusa Tenggara Province that has a very large savanna area, as evidenced by the savanna area reaching 405,705.44 ha (58%) of the total regency area of 7,000.5 km2 (700,050 hectares), making it the largest savanna in Indonesia (Rosary & Ichi, 2025). In the last ten years, Sumba Island has become quite famous, especially in the field of tourism, due to its natural charm and savannahs. However, in addition to tourism, the savannahs in East Sumba are also used as grazing land. The savannahs in East Sumba are the largest carbon sinks after peatlands, mangroves, and seagrass beds. Therefore, it is crucial for the local government to designate savannahs as essential ecosystems to prevent exploitation and development that could cause damage. The savanna plays an important role in the ecosystem and the lives of the Sumba people, such as providing grass, absorbing carbon, as land that produces local food that is highly adaptive to climate change even at the occurrence of famine (*Iwwi*/wild yams, *lua* and edible mushrooms), and as a place for traditional rituals and *Marapu* religious ceremonies (the indigenous beliefs of the Sumba tribe) because there is a *Katuada* (a tool for worshiping ancestors).

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East Sumba Regency is an area with unpredictable rainfall in both coastal, hilly areas and dry climate characterized by low annual precipitation of 697-2,737 mm/year and an average of 44-61 rainy days per year (Hoeve & Remer, 2022). The dry climate on Sumba Island is caused by uneven rainfall and porous rock structures, which cause most of the rainfall to be lost as the water is absorbed into the soil layer (Pemerintah Kabupaten Sumba Timur, 2023). This makes East Sumba Regency prone to natural disasters, especially drought and land fires every year. Fires in savannas occur pre- dominantly during the dry season (Eames et al., 2023). In 2020, the largest fire in East Sumba occurred, causing the number of hotspots to increase every year due to unpredictable weather conditions (Purwanti et al., 2024). In recent years, forest and grassland fires in East Sumba Regency have continued to increase to catastrophic levels. Thousands, even millions, of people have been affected by these fires. Most of these fires occur in areas where there is still a lot of green land, such as forests, grasslands, and vacant land owned by residents (Jawa et al., 2020). The savanna fire process can occur due to extreme hot weather or human actions. Based on an interview with Mr. Deni Karanggulimu, Director of the Foundation for Coordination of Natural Resource Assessment and Management (KOPPESDA), savanna fires caused by human activity are based on several reasons, such as land clearing, cultural practices, and deliberate acts without clear reasons. Every year, the number of savanna fires continues to increase, exacerbated by global warming, which makes shrubs and grass more susceptible to burning. From the beginning to the middle of 2025 alone, there have been more than five cases of savanna fires in several different villages, but only one case has been reported, namely the savanna fire that occurred in Mondu Village (Lodu, 2025).

To date, there has been no court ruling or action by the local government in East Sumba Regency to impose sanctions on those responsible for burning savanna grasslands, due to the lack of regulations, both at the regency and village levels. Local law enforcement officials have also been unable to apprehend those responsible for burning the grasslands. If this situation continues, the consequences could be very detrimental to the community in both the short and long term. Throughout 2025, it was reported that several houses and a guesthouse were victims of savanna fires, as the fires spread from the savanna to residential areas. The long-term effects of grassland burning include contributing to CO2 in the air, loss of biodiversity, local food sources from savannas and forests, as well as ash, soot, particulate matter, and smoke that covers several areas. The smoke produced by grassland fires can interfere with respiratory health and other activities. The impact of this smoke is not only local but can also affect other areas (Saharjo et al., 2025).

Fire regulations in Indonesia tend to focus on forest, peatland, and land fires. As a result, the rules, sanctions, and prevention mechanisms developed are often unsuitable for application in savannas, which have different ecological dynamics and local practices. In regions such as Sumba, there are many traditional burning practices or customary land use practices, but formal legal literature rarely examines how national regulations (Law No. 32/2009, and others) interact/conflict with customary norms.

Many articles discuss law enforcement and sanctions for forest and land fires (especially peatlands), but few examine legal instruments for savanna-based prevention (e.g., land use, savanna management, incentive schemes for communities). Savanna fires are often influenced by a combination of weather, spatial planning, agriculture/livestock, and regional policies, but few legal studies integrate technical factors (meteorology, hotspots) with recommendations for regulatory changes at the district/provincial level. This study presents data on the area burned in a given year and its correlation with land cover (savanna/grassland). This data is important for legal arguments because it helps establish the scale of damage, recurring patterns, and timing of events, all elements necessary when formulating policy or seeking accountability. Field reports emphasize that savanna fires are recurring and influenced by local practices and local climatic conditions, suggesting that legal solutions that simply replicate peatland/forest policies are

insufficient. This supports the need for regulations/policy adaptations specific to savannas.

In response to the increasingly alarming cases of savanna fires, local governments need to take decisive action to ensure that savannas remain a source of life and an important ecosystem in Sumba, rather than becoming a source of public unrest and causing losses. In this study, researchers will analyze and explain the role of local governments, community contributions, and other important figures in creating a safe and sustainable environment, one of which is through the enforcement of environmental laws.

2. Materials and Methods

This study employs a normative-empirical legal method, which combines the study of legal norms (legal materials) with empirical data in the field to examine the effectiveness and implementation of the legal provisions under study. The approaches used in this study include the statute approach to analyse relevant legal provisions and the socio-legal approach to assess the application of these provisions in practice through interviews and observations.

The data used is primary data obtained through interviews with the community and several institutions, such as the East Sumba Regency Environment Agency, the East Sumba Regency Forest Management Unit, and NGOs, in this case the Foundation for the Coordination of Natural Resource Assessment and Management (KOPPESDA), as well as secondary data consisting of primary, secondary and tertiary legal materials. Primary legal materials included Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 32 of 2024 concerning Conservation of Living Natural Resources and Their Ecosystems, relevant laws and regulations, and international environmental law perspectives. Secondary legal materials include scientific literature, books, journal articles, conference proceedings, and expert opinions. Tertiary legal materials include websites and other additional sources that help to explore the case of savanna burning.

Data collection techniques were carried out through literature studies to obtain secondary data, interviews, and observations to directly observe the condition of the burned grasslands/land and the application of regulations and case analysis. Normative data is analysed qualitatively and prescriptively to describe the applicable legal norms, while empirical data is analysed qualitatively and descriptively to explain the facts on the ground. The two are then compared to see the compatibility between norms and practices, as well as to find factors that hinder or support the implementation of the law.

3. Results and Discussion

3.1. Causes and Impacts of Savanna Fires

Savanna fires can occur due to climate change and also due to human actions (Croker et al., 2023). A single fire can dramatically alter key resources and the abundance and diversity of species for decades to follow (Teunissen et al., 2022). Based on an interview with Mr. Triawan Umbu Uli Mehakati, Secretary of the KOPPESDA Foundation, the last temperature measurement taken before the Pertamina gas station and a nearby inn burned down about a month ago (in October) was 36°C, but after the incident, the temperature reached 38-39°C. An example of a case that occurred in 2020 in the Tandaru forest was that the extremely high temperatures caused the humidity in the forest to decrease, eventually drying out the plants. This was then triggered by a cigarette butt that

was carelessly discarded, causing a forest fire. According to data from the Ministry of Environment and Forestry, most fires occur in savannas and scrublands, accounting for 27 percent of fires, compared to other conservation areas. This is followed by dry agricultural land at 19 percent. These fires are caused by materials such as grass, exacerbated by prolonged periods without rain and land cover consisting of savanna and scrubland, which makes fires more likely to occur (Santoso, 2021).

In addition to climatic factors, the most common cause of fires is human activity. The Meteorology, Climatology, and Geophysics Agency (BMKG) states that the frequent land fires in East Nusa Tenggara (NTT) are caused by the continued use of slash-and-burn methods for clearing new agricultural land. Between January and August 2023, forest and land fires in East Nusa Tenggara covered an area of 50,397 hectares. These fires were spread across 18 districts/cities in NTT (Ama, 2023; Kompas, 2017). The savanna fires that occurred in East Sumba Regency in 2019 burned down three houses, and by 2025 at least one house will burn down every year (Molan, 2019). In addition to land clearing, savanna fires are also caused by incorrect/bad cultural practices or habits aimed at creating new land for livestock feed. The community also believes that this can make the land fertile because the ash from burning can reduce the acidity of the soil. Another common reason is the deliberate burning of land to make it easier for people to hunt/catch animals in the fields, or the deliberate burning of fields because there is a desire to steal people's livestock, so the fields are burned to cover their tracks or make them difficult to trace.

Based on interviews with Mr. Umbu Damu, a staff member of the KOPPESDA Foundation who conducted direct observations in the field, locations where grassland fires frequently occur include the northern coast, covering the villages of Hahar, Hambapraing, and Mondu. In the eastern region, fires occur in the villages of Mahu, Piarakuku/Tanarara, Kambata, Nggoa, and Gunung Meja. Meanwhile, in the southern area, grassland fires rarely occur because normal rainfall in this region keeps the savanna green and dewy, making the grass and soil fertile and eliminating the need to burn when clearing new agricultural land. During the period of January-March 2023, the area affected by forest and land fires (*karhutla*) in East Sumba reached 44.68 hectares. This has prompted the Regional Disaster Management Agency (BPBD) of East Nusa Tenggara Province to increase mitigation efforts for forest and land fires in the East Sumba Regency, as it is considered more urgent than other locations in NTT (Setiawanto, 2023).

Based on data on the number of incidents of disturbances, threats, and violations, there are 249.19 hectares of forest prone to fire in the Matalawa National Park area (Sumba Island). According to the Matalawa National Park Office, these incidents began in May, July, August, and September 2023. The forest blocks of the Matalawa National Park Office that are potentially prone to fire are located in the areas of Kangeli, Laipalu, Padang Gau, Tanadaru, Konda Maloba, Nggongi, Taman Mas, Laikobang, Mahaniwa, Katikutana, Mamohung, Langgaliru, and Padang Praikaningu villages. The burned forest areas of the Matalawa National Park Office are located in savanna areas that are prone to fires caused by irresponsible individuals who burn land to clear it for new agricultural use. However, there are also cases caused by carelessly discarded cigarette butts or deliberate arson. The National Park Office continues to monitor the situation through

hotspots and has also set up 8 command posts in the forest area (Liza, 2018)se. Banners containing appeals to the public not to burn forests and land have also been put up. The National Park Office also routinely checks hotspots 24 hours a day. If a hotspot is detected, it is immediately sent to the officers at each command post to conduct a direct check in the field. However, not all hotspots are forest or land fires (Habibudin et al., 2023). Based on data obtained from the Regional Technical Implementation Unit for Forest Management (UPTD KPH) in East Sumba Regency, from May to October 2025, 21 subdistricts in East Sumba Regency experienced savanna fires caused by carelessly discarded cigarette butts and new land clearing, with the area of the fire inside the forest covering 15-1,330 hectares, and outside the forest covering 20-2,450 hectares.

Savanna fires undeniably have a positive impact, namely the growth of new green grass (Cristine et al., 2023). Vegetation—a process which reflects how the well-timed fires burn only grasses that have sufficiently cured, leaving the adjacent uncured grasses unburned (Laris, 2021). Burning savanna land benefits livestock/provides feed for livestock and contributes positively to the Regenerative Agriculture system. However, despite these benefits, the negative impacts are greater. One of these is widespread disruption to the ecosystem. The reduction in forest cover due to savanna fires has resulted in a decline in the types of grasses that support overall ecosystem growth. In addition, savanna fires also cause temperatures to rise, making communities more susceptible to disease. Other impacts include house/garden and field fires caused by uncontrolled and improper burning of grasslands. Another impact is felt during times of famine, when communities lose their local food sources provided by nature (such as tubers that only grow in grasslands and can help them in such situations) (Eames et al., 2025).

Global warming causes warmer and drier conditions, prolonging the dry season and drying out vegetation, making it more susceptible to burning. Emissions from fires then further increase GHG concentrations, which in turn accelerate global warming and create conditions more conducive to future fires. Uncontrolled savanna burning causes environmental damage, such as soil erosion and land degradation, forest fires, and loss of water sources. Based on this, land burning is permitted if the area burned does not exceed 2 (two) hectares per family and this is in accordance with local wisdom. However, if the area burned exceeds 2 (two) hectares, local wisdom cannot be used as a basis for clearing land and may be subject to criminal penalties in accordance with applicable regulations (Sheebakayla, 2024).

3.2. Environmental Law Analysis

a. The Applicable Legal Basis

The correlation between savanna burning and environmental law is quite strong, mainly because savannas are vulnerable ecosystems that serve important ecological functions. Legally, savanna burning is classified as an activity that has the potential to damage the environment, and is therefore subject to several regulations, such as Law No. 32 of 2009 concerning Environmental Protection and Management (PPLH). Based on the PPLH Law, savanna burning falls under the category of environmental degradation as stipulated in Article 69 paragraph (1) letter h: "Everyone is prohibited from committing acts that result in pollution and/or destruction of the environment." Savanna burning also falls under the category of open burning as regulated in Article 69 paragraph (1) letter i, which explicitly prohibits land clearing by burning. Violations of these articles are

punishable by criminal sanctions (imprisonment & heavy fines), administrative sanctions (revocation of permits, administrative fines) and civil liability (compensation).

The savanna ecosystem, especially in NTT, Sumba, and Flores, is the habitat of endemic animals such as Sumba horses, Timor deer, and certain birds. Therefore, the destruction or damage of savannas can be classified as damage to living natural resources as regulated in Law No. 32 of 2024 concerning Conservation of Living Natural Resources and Their Ecosystems. If savanna burning damages the habitat of protected animals/plants, the perpetrators can be subject to sanctions under conservation laws. In addition to being regulated by national law, the phenomenon of savanna fires can also be linked to the perspective of international environmental law. Several relevant principles include the Precautionary Principle, the No Harm Rule, and Sustainable Development, which encourage countries to pay special attention to this issue.

In many areas of NTT, including Sumba, savanna burning is often carried out traditionally to stimulate the growth of grazing grass and open up livestock trails. However, Indonesian law only allows very limited burning if it meets the conditions set out in Article 69 paragraph (2) of the Environmental Protection and Management Law, whereby burning is permitted under strict conditions and in accordance with local wisdom, namely: it must be controlled, not widespread, have permission/be under the supervision of the competent authorities, and be carried out by local communities who have been doing so for generations. The majority of savanna fires in Sumba do not meet these requirements and therefore remain illegal. In addition to national laws, local regulations and village regulations play a crucial role in preventing and addressing cases of savanna burning. Some areas have village regulations on pasture management, but these generally do not detail burning mechanisms. Unfortunately, East Sumba Regency itself does not yet have local regulations governing either grazing land management or burning mechanisms.

b. Normative Analysis

Several cases of savanna fires in East Sumba from 2019 to 2025 include the following: (a) The Laiwangi Wanggameti & Tanah Daru savanna area, East Sumba. Fires occur almost every year during the dry season, mostly caused deliberately by residents to stimulate grass growth for livestock. Several points are considered permanent hotspots (recurring every year), with fires spreading across thousands of hectares of savanna. The local government and the National Park Office often issue warnings and conduct patrols, but criminal prosecution is minimal. No major cases have resulted in court verdicts, due to the difficulty of proving who the "arsonists" are in the field. It is difficult to determine who committed the crime, when and where it occurred, and the vastness of the savanna also makes physical surveillance difficult. (b) Savanna Fires in Matalawa National Park (2020–2022). Every dry season, approximately 300–500 hectares of savanna within the national park are burned. Fires in this National Park are often reported because the smoke spreads and covers other areas, including the Wairinding tourist area. The causes of the fires are almost the same as in other savanna areas, namely to clear paths for livestock, hunt animals such as wild boars and deer, and encourage grass growth. Enforcement efforts carried out by the Matalawa National Park Office include issuing warning letters and setting up hotspot posts. The authorities have also conducted preliminary investigations into several cases, but again, no perpetrators have been punished. From a legal perspective, because this national park is a conservation area, heavier sanctions should apply (Law on Conservation of Living Natural Resources and

Their Ecosystems). However, enforcement remains low because the burning is considered a tradition and not commercial burning as in the cases in Kalimantan/Sumatra. In addition, the main livelihood of the community is through animal husbandry, so to stimulate grass growth, the community chooses to burn the grasslands.

The Savanna Fire Case & Violation of the Environmental Protection and Management Law shows that there is no strong precedent. Unlike forest fire cases in Sumatra/Kalimantan, which resulted in major court rulings (e.g., the cases of PT BMH, PT Kalista Alam, etc.), Sumba does not have any major precedents that can be used as legal references because no large companies were involved, the perpetrators were individuals/small communities, and the authorities tended to use a persuasive approach. From an environmental law perspective, the prohibition on burning land is clear and explicit in Law 32/2009, and if it occurs in a conservation area, the penalties are more severe (Law 32/2024). Formally, savanna burning is an illegal act, except for limited burning for local wisdom that meets certain requirements.

The core issue of the savanna fires in Sumba is the conflict between local wisdom and national law. National law prohibits burning, while local tradition allows controlled burning. Because it is difficult to distinguish between what is "controlled" and what is "destructive" in the field, law enforcement is weak. Thus, savanna fires in Sumba are prohibited by environmental law, but due to weak enforcement, the justification of local wisdom, and the difficulty of proving guilt, almost all cases end without sanctions, even though thousands of hectares of savanna are burned each year, causing harm to the community. Difficulties in proving guilt often arise because the perpetrators burn the fields at night, making it difficult to find witnesses. The vast area of grassland/land makes proving causality very difficult. To date, there has not been a single case of savanna burning that has reached the court stage in East Sumba district.

Referring to Lex ferenda (what should be done), the government needs to create specific derivative regulations for savannas, in this case through Regional Regulations or Village Regulations. Law enforcement also needs to use a new evidence system with technology (e.g., drones or natural CCTV). To date, savannas have not been categorized as "specially managed" ecosystems, unlike forests, peatlands, or protected areas. Therefore, the state has an obligation to protect savanna ecosystems, including flora, fauna, and environmental services such as livestock feed, carbon reserves, and tourism. This obligation is a state responsibility in the perspective of international law. Another important point is that burning should no longer be considered an unlimited traditional practice. Local wisdom should only be used if there is evidence of a tradition that truly regulates safe burning techniques, its implementation needs to be monitored, and most importantly, there are restrictions on location and time. If not restricted, then the tradition is considered obsolete customary law (a custom that is no longer relevant because it harms the environment).

c. Policy Options

The government can create a new evidence system in the form of "Digital Environmental Law Enforcement" such as patrol drones, GPS hotspot detectors, and long-distance CCTV in vulnerable areas, considering that one of the main problems is the difficulty in finding the perpetrators of the fires. With this evidence, the authorities can name the perpetrators as suspects using the "scientific evidence" method.

In addition to creating a new verification system, the local government must also establish specific regulations related to savanna management, which cover several issues such as restrictions on savanna burning, licensing/monitoring mechanisms for traditional burning, zoning of savannas that may or may not be burned, administrative penalties and fines, and ecosystem restoration obligations. Currently, there are no specific regulations due to limited funds, making it difficult to directly implement national laws. Nevertheless, the East Sumba Government has included savanna ecosystem protection in the 2024-2044 Spatial Plan (RTRW) through a process that involved the community. It is also included in the 2025-2029 RPJMD, which includes indicators for cultural preservation, environmental preservation, and ecosystem preservation. It is hoped that by 2026, the regulations will be finalized and implemented (Rosary & Ichi, 2025).

Currently, the East Sumba district government, together with several community leaders and NGOs, is in the process of achieving national recognition and protection for customary law communities. This will have a positive impact on customary law communities as owners of customary territories, including forests and customary lands. This will make it easier for the government and the community to work together to protect the environment and nature from potential damage in the future. The government can strictly regulate that local wisdom may still be practiced, but several important points must be taken into consideration, such as: it may only be practiced by registered indigenous groups; it must be supervised (by the village/forest police); a "control line" must be established to prevent the fire from spreading; it may only be practiced during certain months; and any remaining fires must be extinguished. Failure to comply with these regulations will result in the burning being considered illegal and subject to sanctions. Other policy options could include Penal and Non-Penal mechanisms. Penal mechanisms in this case could impose criminal and civil sanctions (Kementerian Lingkungan Hidup dan Kehutanan, 2024), in addition to administrative sanctions, while Non-Penal mechanisms could include education, alternative fodder crop programs, and written village commitments.

d. Long Term Solution

Based on the results of field interviews, it was found that several agencies and NGOs have made efforts to help raise public awareness of the impact of savanna fires and fire prevention measures for the future. For example, the KOPPESDA foundation has conducted community outreach and provided education on agricultural land in eastern Sumba, encouraging the community to stop slash-and-burn practices and providing information on proper slash-and-burn techniques that do not damage the environment. It also provides information and instruction on the creation of terraced planting systems and the preparation of land for planting animal feed. These activities have been carried

out in the villages of Tandula Njangga and Tandula Kamaru. Another activity carried out is providing legal drafting training to the village community so that they can create their own village regulations on savanna fires. This has been done in the villages of Nappu, Mbatakapidu, and Pambota Njara.

Based on an interview with Mr. Melvi Reimon M. Tiga, Junior Environmental Impact Control Officer at the East Sumba Regency Environment Agency, he said that the environment agency and the Forest Management Unit (UPTD Kesatuan Pengelolaan Hutan) had formed a Fire Awareness ComFmunity (MPA), but there had been no significant change in the community's mindset. In addition, the local government is also trying to control the greenhouse effect by organizing tree planting programs at springs and on community land related to reforestation/greening. In carrying out its work program, the environmental agency collaborates with several institutions such as KOPPESDA, SID, Bumi Lestari Institute, the Customary Territory Registration Agency, the Indigenous Peoples Alliance of the Archipelago (AMAN), and the Stimulus Institute for Drought Issues.

The researchers also interviewed Mr. Marlon Remi, Forest and Forest Product Security Officer at the Regional Technical Implementation Unit for Forest Management (UPTD KPH) in East Sumba Regency. He said that the KPH always conducts outreach activities in every village in May to October, conducting patrols to prevent forest and land fires, in which the KPH collaborates with the Ministry of Forestry, in this case the Forest and Land Fire Control Agency (BPKHL). In carrying out their duties, the Patrol Team will contact all village government officials who are targeted for outreach and personal operations to the community. It is said to be personal because there is no budget to gather the community for socialization, so the patrol team visits people from house to house to convey the importance of preventing forest and land fires. These patrols are conducted once a month from May to October. This year, the Patrol Team operated in the Napu and Wunga areas in May. The locations of grassland fires are determined by the Forest and Land Fire Warning System (SPARTAN) issued by the Meteorology, Climatology, and Geophysics Agency (BMKG) to provide early warnings of potential forest and land fires in Indonesia.

4. Conclusions

Burning savannas is an illegal act according to the Environmental Protection and Management Law, which means that perpetrators of savanna and forest fires can be subject to administrative, criminal, and civil sanctions. Local wisdom as a cultural practice is in fact only a very limited exception, so local governments must take a firm stance on this issue. This does not mean eliminating local wisdom, but rather that cultural practices must be carried out responsibly and monitored closely.

Environmental law research in Indonesia has so far been heavily focused on peatland fires (Riau, Sumatra), forest fires in Kalimantan, cases involving large corporations (PT Kallista, PT BMH, PT NSP, etc.) and the enforcement of strict liability on companies. This has created an ecosystem bias because savannas are not considered a priority, even though Sumba savanna is one of the largest and most unique savannas in Indonesia. In addition, savannas do not have a special protection regime in laws or government regu-

lations. The existing literature is dominated by the enforcement of the Ministry of Environment and Forestry, corporate obligations, and civil/administrative decisions against large companies, but in the Sumba savanna, the perpetrators of burning are often not large corporations. The main actors are local communities, ranchers, village heads, and small landowners. Therefore, key authority lies with local governments such as regents, environmental agencies, technical regional government agencies, and sub-district heads. This research expands the development of Indonesian environmental law by introducing the savanna ecosystem as an object of legal protection that has been neglected, building a savanna ecology-based regulatory framework, emphasizing the role of local government in controlling non-forest fires, and offering a socio-juridical analysis of the conflict between customary law and state law.

Local governments are required to establish technical regulations for savannas due to their unique and vulnerable nature, whether in the form of district regulations or village regulations. By looking at neighboring districts, a lack of funds should no longer be an excuse, as savanna and forest fires have reached a level of urgency that requires joint action. Law enforcement must also shift to technology-based evidence. If law enforcement officials rely solely on non-technological evidence, the situation will remain the same as in recent years, where perpetrators cannot be caught. The government can also collaborate with various institutions in approaching the community, both through socialization and direct practice, so that the community understands the dangers of savanna fires and has other options that benefit all parties and save the environment. The best approach is a combination of education, regulation, conservation, and law enforcement.

5. Patents

Supplementary Materials: The following supporting information can be downloaded at: https://legal.isha.or.id/index.php/legal/index, Figure S1: title; Table S1: title; Video S1: title.

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