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# Why They Don't Burned? Lessons from Bengkulu Forest Fire Management, Indonesia

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## Abstract

Forest fires are one of the major problems for the global environment because they are both causes and consequences of global warming. This problem is increasingly urgent for Indonesia, which is one of the largest countries contributing to forest fires. In the last five years, almost all provinces except the capital city of Jakarta have experienced the forest and land fires. Of all the burnt provinces, Bengkulu was the least affected by the fire, although it was surrounded by the province with the highest intensity of forest and land fires in Indonesia. The purpose of this study is to identify the factors that cause Bengkulu to have a very low intensity of forest and land fires. The method used is a literature study both news, reports, and research results related to forest fires in Indonesia and Bengkulu in 2019. The results show that there are five main factors that contribute to the low level of forest and land fires in Bengkulu: (1) effectiveness of media framing for provincial leadership comprehensive action, (2) local wisdom of tribal communities, (3) wide and evenly distributed conservation areas managed by central and local governments, (4) extensive palm plantation, and (5) international cooperation. The combination of these factors makes Bengkulu have very minimal forest fires. The government is expected to immediately take the perspective of stakeholders that involve local communities, businesses, and the media to assist in the prevention and suppression of forest and land fires in Indonesia. This study is the first research that identifies a unique area as a source of best practice in preventing forest and land fires and explores the factors driving this prevention effort.

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Keywords: forest and land fires, forest governance, media framing, local wisdom, paternalistic leadership, palm oil

# ¿Por qué no se queman? Lecciones de la gestión de incendios forestales de Bengkulu, Indonesia

Resumen

Los incendios forestales son uno de los principales problemas para el medio ambiente mundial porque son causas y consecuencias del calentamiento global. Este problema es cada vez más urgente para Indonesia, que es uno de los países más grandes que contribuyen a los incendios forestales. En los últimos cinco años, casi todas las provincias, excepto la ciudad capital de Yakarta, han experimentado incendios forestales y terrestres. De todas las provincias quemadas, Bengkulu fue la menos afectada por el incendio, aunque estaba rodeada por la provincia con la mayor intensidad de incendios forestales y terrestres en Indonesia. El propósito de este estudio es identificar los factores que causan que Bengkulu tenga una intensidad muy baja de incendios forestales y terrestres. El método utilizado es un estudio de literatura de noticias, informes y resultados de investigaciones relacionadas con incendios forestales en Indonesia y Bengkulu en 2019. Los resultados muestran que hay cinco factores principales que contribuyen al bajo nivel de incendios forestales y terrestres en Bengkulu: ( 1) efectividad del marco de los medios para la acción integral del liderazgo provincial, (2) sabiduría local de las comunidades tribales, (3) áreas de conservación amplias y uniformemente distribuidas administradas por los gobiernos centrales y locales, (4) plantaciones extensivas de palmeras y (5) cooperación internacional . La combinación de estos factores hace que Bengkulu tenga incendios forestales muy mínimos. Se espera que el gobierno tome inmediatamente la perspectiva de las partes interesadas que involucran a las comunidades locales, las empresas y los medios de comunicación para ayudar en la prevención y extinción de incendios forestales y terrestres en Indonesia. Este estudio es la primera

investigación que identifica un área única como fuente de mejores prácticas para prevenir incendios forestales y terrestres y explora los factores que impulsan este esfuerzo de prevención.

Palabras clave: incendios forestales y terrestres, gobernanza forestal, encuadre mediático, sabiduría local, liderazgo paternalista, aceite de palma.

## 1. INTRODUCTION

Indonesia is one of the largest countries contributing carbon dioxide into the air through forest and land fires (Pribadi and Kurata, 2017). Every year, Indonesia becomes a major contributor to the fog blanket in Southeast Asia (Ekayani, Ridho and Darusman, 2016). During 2014-2019, Indonesia lost 4.6 million ha of land due to fire (Ministry of Environment and Forestry of Indonesia, 2019). Forest and land fires in 2015 were the worst with an area of burning land of up to 2.6 million ha (See Figure 1). The severity of the fires that occurred pushed neighboring countries to help in mitigation efforts (Lin, Wijedasa and Chisholm, 2015).

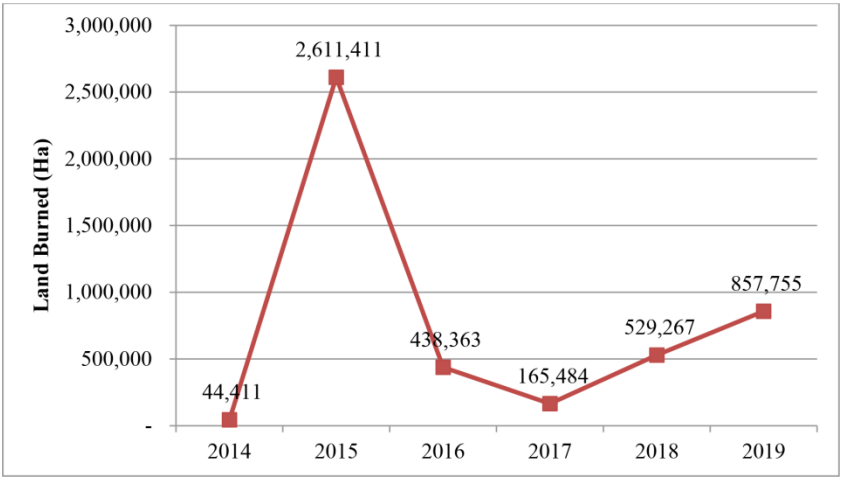


Figure 1: Forest fire in Indonesia 2014-2019 (Ministry of Environment and Forestry of Indonesia, 2019)

The worst forest fires in Indonesia occurred in 1997 with an area of 4.6 million ha, equivalent to the amount of land burned in the 2014-2019 period. Although fires in recent years have not been as severe as in the late 1990s, concern has arisen for finding long-term solutions to this problem (Chisholm, Wijedsa and Swinfield, 2016). Some of the causes of these fires are human actions for the purpose of land clearing. Even global warming, one of the factors that cause natural forest fires that seem natural, also comes from human activities (Devkota and Lal, 2017). Therefore, this should be prevented, especially since there are many legal instruments that should be able to further suppress the number of forest fires in Indonesia.

The common solution put forward is the improvement of technology and infrastructure of forest fire supervisors and managers

(Lestari, Rumantir and Tapper, 2016). Meanwhile, legal solutions have been implemented through Law No. 32 of 2009 concerning Environmental Protection and Management. This law prohibits land clearing by burning with the threat of imprisonment of 3-10 years and fines of between Rp. 3 billion and Rp. 10 billion (US$ 213,000 to US$ 710,000). Even so, the fact that forest fires continue to occur indicates that these environmental legal instruments still do not have the real power to prevent environmental damage.

Almost all provinces in Indonesia, except the capital city of Jakarta, are faced with forest and land fires every year. The highest intensity is almost always in the western region around the equator, which includes Riau, Jambi, South Sumatra, and provinces in Kalimantan. The following table shows the ratio of fires per area of provinces in Indonesia (ha per $km^2$) in 2019. Note that South Kalimantan is the province with the most forest fires with an area of forest and land fires of 3.08 ha/$km^2$ or equivalent to 3.08% of the total area that experienced forest fires in 2019. East Nusa Tenggara was ranked second with 2.51% of the area burned while West Kalimantan was 1.11%.

Table 1: Percentage of Province Area Burned in 2019

| | **Province** | **Size ($km^2$)** | **Fire (ha)** | **Fire/Size** |
|---|---|---|---|---|
| 1 | Aceh (A) | 57,365 | 680 | 0.01 |
| 2 | North Sumatra (NSM) | 72,981 | 2,416 | 0.03 |
| 3 | West Sumatra (WSM) | 42,297 | 1,449 | 0.03 |

| | | | | |
|---|---|---|---|---|
| 4 | Riau (R) | 94,560 | 75,871 | 0.8 |
| 5 | Jambi (J) | 53,509 | 39,638 | 0.74 |
| 6 | Bengkulu (BG) | 19,789 | 11 | 0.0006 |
| 7 | South Sumatra (SSM) | 85,679 | 52,716 | 0.62 |
| 8 | Lampung (L) | 35,376 | 6,560 | 0.19 |
| 9 | Riau Islands (RI) | 8,084 | 6,124 | 0.76 |
| 10 | Bangka Belitung Islands (BBI) | 16,424 | 3,228 | 0.2 |
| 11 | Banten (BN) | 9,019 | 9 | 0.001 |
| 12 | Jakarta (CC) | 740 | - | - |
| 13 | West Java (WJ) | 35,245 | 4,898 | 0.14 |
| 14 | Central Java (CJ) | 33,987 | 4,390 | 0.13 |
| 15 | Yogyakarta (Y) | 3,133 | 23 | 0.01 |
| 16 | East Java (EJ) | 47,921 | 13,325 | 0.28 |
| 17 | Bali (BL) | 5,561 | 334 | 0.06 |
| 18 | West Nusa Tenggara (WSEI) | 19,950 | 22,046 | 1.11 |
| 1 | East Nusa Tenggara (ESEI) | 47,676 | 119,45 | 2.51 |

| | | | | |
|---|---|---|---|---|
| 9 | | | 9 | |
| 20 | West Kalimantan (WK) | 115,114 | 127,462 | 1.11 |
| 21 | Central Kalimantan (CK) | 153,564 | 134,227 | 0.87 |
| 22 | South Kalimantan (SK) | 36,805 | 113,454 | 3.08 |
| 23 | East Kalimantan (EK)* | 194,849 | 52,934 | 0.27 |
| 24 | North Sulawesi (NSL) | 13,931 | 3,978 | 0.29 |
| 25 | Central Sulawesi (CSL) | 68,090 | 8,182 | 0.12 |
| 26 | South Sulawesi (SSL) | 46,116 | 12,888 | 0.28 |
| 27 | Southeast Sulawesi (SESL) | 36,757 | 3,699 | 0.1 |
| 28 | Gorontalo (G) | 11,968 | 1,323 | 0.11 |
| 29 | West Sulawesi (WSL) | 16,787 | 2,125 | 0.13 |
| 30 | Maluku (M) | 49,350 | 15,479 | 0.31 |
| 31 | North Maluku (NM) | 42,960 | 1,482 | 0.03 |

| | | | | |
|---|---|---|---|---|
| 32 | Papua (P) | 309,934 | 26,777 | 0.09 |
| 33 | West Papua (WP) | 114,566 | 568 | 0.005 |
| | **Total** | **1,900,087** | **857,755** | **0.451** |

Notes: * including newly created province, North Kalimantan; source: fire data from Ministry of Environment and Forestry, 2019

Note that in the table above, the province with the smallest burnt area is Bengkulu. The interesting thing from Bengkulu is that this province is actually located in the western area of the equator. The province was surrounded by several provinces that were severely burned (Riau, Jambi, South Sumatra). The province also has considerably low population density, with only 102 people/km$^2$, compared to the national average, 142 people/km$^2$ (Bappenas, BPS and UN Population Fund, 2013), hence, population density is not a factor. For more details, the following figure shows Bengkulu's position on the geographical map of Indonesia with a coloration that indicates the percentage of land area burned.

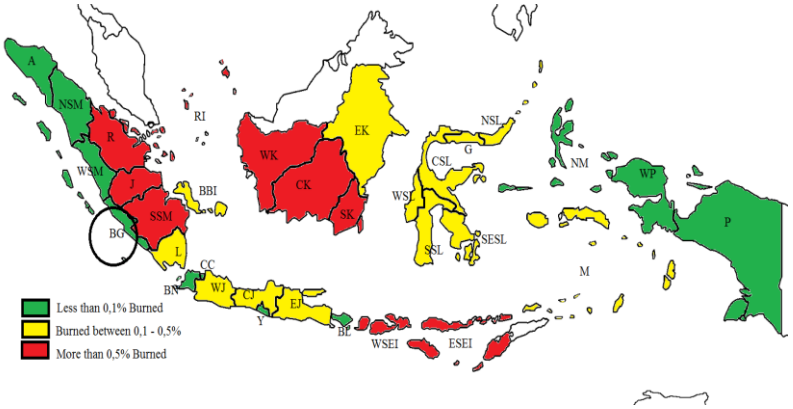


Figure 2: Map of Burned Area by Province

As seen from the Figure above, the Java region with a dense population still has a large burned area. Low fire areas are on the west coast of Sumatra or in the Papua region. Bengkulu (BG) and West Sumatra (WSM) are interesting cases because they are areas that burn very little, although its neighbors in the east, Jambi (J), Riau (R), and South Sumatra (SSM) are burning violently. From Table 1 it is known that the Bengkulu area was very little burned, only amounting to 0,0006% of its area. West Sumatra is burned as much as 0.03%, still bigger than Bengkulu. In fact, Bengkulu is the province with the lowest fire area in Indonesia, ignoring the capital city of DKI Jakarta.

This very low value could be due more to the method of data collection. Even so, the MEF (Ministry of Environment and Forestry) uses Landsat 8 OLI / TRS satellite data that is overlaid with hotspot distribution data, ground check results reports, and blackout reports carried out by *Manggala Agni* (MEF firefighters). Therefore, this data is relatively real-time and is valid enough to be used.

To examine the possibility that this data is only temporary, an examination was conducted several years earlier. From Figure 3 it can be seen that the trends occurring in Bengkulu are relatively consistent. In 2014, there were only 5 hectares of land and forest burned in Bengkulu. In 2015 there was an increase of up to 1,000 hectares in 2016, but it was still only 0.228% of the area burnt in Indonesia that year, whereas Bengkulu's area was 1.04% of Indonesia. From 2017 - 2019, the area of forest and land fires will continue to decline to only 11 hectares in 2019.

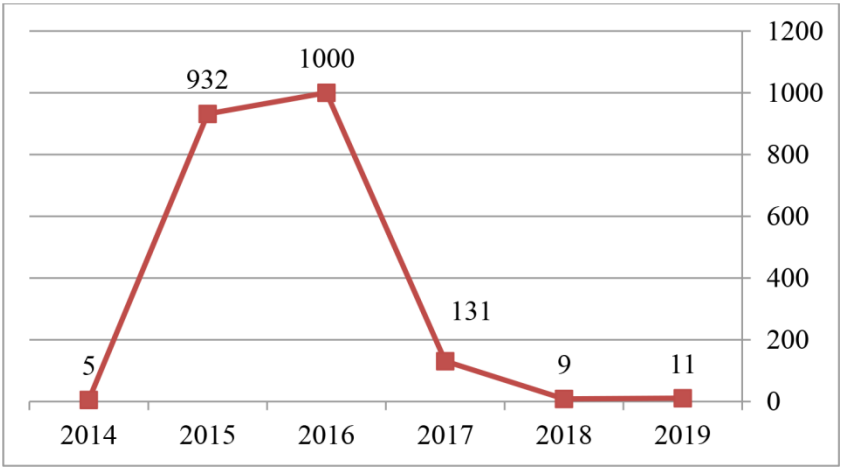


Figure 3: Forest fire in Bengkulu 2014-2019 (Ministry of Environment and Forestry of Indonesia, 2019)

There have never been previous studies that have tried to identify, let alone explore why forest and land fires in Bengkulu are so low compared to other provinces in Indonesia. This is a lost

opportunity from the scientific literature to be able to understand the factors that support efforts to reduce the level of forest and land fires in Indonesia. In fact, the literature continues to encourage the level of the forest and land fires in Indonesia to be sought for long-term solutions (Chisholm, Wijedsa and Swinfield, 2016; Fernandes, Panjaitan and Solimun, 2018; Goldstein, 2019).

The purpose of this study is to identify the factors that cause the level of forest and land fires in Bengkulu to be so low. The novelty of this research is the use of the Bengkulu case as a best practice in preventing forest fires in Indonesia. The significance of this research lies in the identification of factors that could potentially be used by other provinces in Indonesia to prevent forest and land fires in the region.

## 2. METHOD

We use the stakeholder theory, which is a general framework in the management of natural resources, including forestry (Fasona *et al.*, 2019). Specifically, the stakeholder theory used highlights stakeholder identification (Mitchell, Agle and Wood, 1997). Stakeholder identification theory is used because the issue of forest fires involves and influences many parties (Bodin, 2017).

According to Mitchell et al (1997), stakeholders can be distinguished based on power, legitimacy, and urgency. Based on these three dimensions, seven types of stakeholders can be classified: dormant, dominant, discretionary, dangerous, definitive, dependent, and demanding (Mitchell et al, 1997). Based on the definition of each

type of stakeholder, we place the international community and military as dormant stakeholders since they have power but no legitimacy and urgency. The central government has become a dominant stakeholder since they have power and legitimacy but there is no urgency to forest fire management, at least proven by the continuous occurrence of forest fire for decades in Indonesia. Local government and general society, however, could classify as discretionary stakeholders. They have legitimacy for local fire management, but no power and urgency either as long as they are not affected by the fire. The media is dangerous stakeholders because they have the power to collect news and the urgency to spread the news about fire but without legitimacy to forest fire management. Local peoples, including village government, are definitive stakeholders. They are the most affected people. NGOs are dependent on stakeholders. They don't have power but have urgency and legitimacy. Private companies, especially in agriculture, and scientists, are demanding stakeholders, have urgency but no power and legitimacy.

We search for news, government reports, and scientific studies either local or international using Google and Google Scholar search engines regarding forest fires in Bengkulu. We did not find scientific studies on forest fires in Bengkulu but found a number of news articles. Government reports and scientific studies are only general in nature and from this general report and article, we draw conclusions for the situation in Bengkulu.

## 3. RESULTS

From 10 stakeholders, we found unique contributions from six parties. These contributors include the international community, central government, regional governments, the media, local residents and the private sector. We did not find tangible contributions from the military, the general public, NGOs, and scientists. These contributions are grouped into a number of factors that contribute to the low level of forest fires in Bengkulu province. These factors reflect the various environmental protection mechanisms implemented by the six stakeholders.

### *3.1. Effective Media Framing for Provincial Leadership Comprehensive Action*

Local media is quite good in an effort to socialize the problem of forest fires. At the end of September 2019, local media reported that their governor was appointed as the commander of the Forest and Land Fire Task Force by the Minister of the Interior through Radiogram No. 364/9565 / SJ on 17 September 2019 (Oktriandi, 2019). In fact, all governors in the area that experienced forest fires in September were appointed as commanders in their respective territories. But Bengkulu's local media made better framing, giving rise to a strong message that the top leaders in the province acted decisively in combating forest fires. Moreover, although the actual assignment was given on 17 September 2019, new news was released on 29 September 2019, when the Governor formed a task force (*satgas Karhutla*) at the

district and city level, giving the impression that the Governor acted quickly and moved directly to create strategic steps at a lower level.

The word used is also strong to describe the governor's actions, namely using the word "forming the Karhutla task force", in contrast to the media in other provinces that use softer words such as "urging regional heads to form the Karhutla task force" (Analisa Daily, 2019). Actually, the word "appeal" is a more appropriate word than "forming". This is due to differences in authority between the center and the regions. The Indonesian government system basically consists of three types: central government, local government, and village government. The central government is represented by governors in each province and is directly under the president. Although on a regional basis, the province consists of a number of regencies and cities, regencies and cities governments are not under the command of the governor. Local governments work in each regency and city are under the Ministry of Home Affairs. Likewise, each regency is divided into a number of districts, which in turn are divided into a number of villages. Even so, the village government is not under the command of the regency/city government. The village government works under the Ministry of Villages. Even so, some people are still in the pre-decentralization paradigm where the governor oversees the regency/city and hence, the word "forming" gives the impression of an era of pre-reform centralization that has a command system.

In line with this, the use of the term "Dansatgas" (commander of the task force) is a military term, giving rise to the impression that the governor has great power, includes civil-military, and is able to take

militaristic actions on the forest burners. Previously, Dansatgas Karhutla's position was indeed in the hands of the military, but it was inefficient because it suggested that the process of extinguishing the fire was only in the hands of the army, not civilians. For example, in South Sumatra, long before Dansatgas Karhutla's position was transferred to the governor, military leaders had ordered firing on the spot for land burners, but fires continued on a large scale (Sripoku, 2019). Meanwhile, the news also conveyed how the police had succeeded in arresting a number of forest fires, again emphasizing the security aspect.

The framing of the Bengkulu governor above is in contrast to the framing of the actions which are actually more or less the same by governors in other regions who are actually faced with more serious cases. In Riau, the status of the governor of various Dansatgas Karhutla was only briefly mentioned in the news content. Likewise, reports about the role of the governor in North Sumatra and South Sumatra are more impressive that the governor carries out ceremonial activities such as holding meetings, declaring himself serious, or establishing status (Antara, 2019; Medan Headlines, 2019; Tribun News, 2019). This kind of ceremonial activity can easily escape the attention of the community because it does not highlight the importance of the problem to be raised. Likewise, other reports suggest that forest fires are only the problem of the government, not the problem of the community.

Framing is the process by which humans develop a certain conceptualization of a problem or reorientation of thinking about a

problem (Abrajano, Hajnal and Hassell, 2017). The media can do framing by promoting certain problems, along with their interpretation, moral evaluation of them, or recommendations to overcome them (Weder, Voci and Vogl, 2019). Framing by the media is able to influence people's perceptions and behavior so that they form a particular conception or orientation to the problem being framed (Mason *et al.*, 2017). Research that highlights the role of the media in forest fire news and its handling also emphasizes the important role of media framing in solving environmental problems (Davidson, Fisher and Blue, 2019).

The effectiveness of media framing is inseparable from paternalism which is characteristic of leadership in a collective country such as Indonesia. Paternalism is a strong leadership style but uses the image of a father's kindness (Mansur, Sobral and Goldszmidt, 2017). Paternalism is still very strong in Indonesia (Selvarajah *et al.*, 2017), especially that the governor is a political figure who is directly elected by the community. A positive label on the governor can motivate people to follow what their governor exemplifies.

### *3.2. Local Wisdom*

Local communities with low socioeconomic status in Indonesia partly depend on forest products. When a ban on logging in the forest had not yet been enacted, many local people worked as loggers and sellers of wood. Another part of the community is farming with a pattern of shifting cultivation, with the process of burning land to open

new fields. The Environmental Law still tolerates people who burn land for cultivation as far as this is done on a maximum of 2 hectares per household and is used for planting local variety plants and surrounded by firebreaks to prevent the spread of fire to the surrounding (Murhaini, 2016).

Even so, some people hold different values in relation to the forest and still maintain it even though modern life offers fast income from extracting forest resources. The Serawai tribe in the South Bengkulu region are among those who respect the forest. They have a *rintis* value, which is a prohibition on working on the land or cutting down trees in certain forest areas (Dihamri, 2016).

Likewise, the Rejang Tribe which is widespread in five regencies in Bengkulu: Rejang Lebong, Kepahiang, North Bengkulu, Central Bengkulu, and Lebong, have strong local wisdom regarding forest preservation. They have certain forest areas that are considered to have supernatural watchmen (*imbo piadan*) so that people do not dare to clear the land in this forest and try to maintain the forest prohibited from various problems (Mahdi, Miinuddin and Mike, 2019).

The strength of the prohibited forest culture in Bengkulu is shown by the issuance of MEF decree No SK.312 / MenLHK/ Setjen / PSKL.1 / 4/2019 concerning Indigenous Forest Maps and Indigenous Forest Indicated Areas Phase 1. In this map, there are at least four customary forest areas recognized in Bengkulu Province. The existence of this customary forest indicates that local people really appreciate the existence of the forest as their cultural hereditary area.

Local wisdom to prevent and extinguish forest fires actually exists in various parts of Indonesia, such as in Papua, Kalimantan and Riau (Astiani *et al.*, 2019; Oja *et al.*, 2019; Titisari, Zen and Janna, 2019). However, these local wisdom are not effectively applied in forest control and fire control in the real field (Oja *et al.*, 2019).

In addition, in the Map of Indigenous Territories in Sumatra, Bengkulu is one of the largest areas for the number of indigenous territories. As of 2019, there were 17 traditional territories recorded in Bengkulu province, far more than Jambi (3 traditional territories) and South Sumatra (3 traditional territories) (BRWA, 2019). The total customary area in Bengkulu Province is 594.78 $km^2$ or 3.01% of Bengkulu Province area, inhabited by five tribes: Enggano, Rejang, Sambat, Serawai, and Semende. Although small in size, people preserve forests in various ways (Table 2).

Table 2: Local Wisdom of Indigenous Areas in Bengkulu related to Forest Conservation

| **No** | **Indigenous Area** | **Size (Ha)** | **Local Wisdom Related to Forestry** |
|---|---|---|---|
| 1 | Kaudar Enggano | 39,957 | An island in the Indian Ocean. No one can cut down mangrove trees on this island. |
| 2 | Rejang Bangun Jaya | 842 | Certain trees such as trees along streams (*Kiyeu Setimbang* |

| | | | |
|---|---|---|---|
| 3 | Rejang Lubuk Kembang | 1,005 | *Alam*) and honeycombs trees (*Kiyeu Celako*) are prohibited from being cut down. Knowledge / Wisdom for planting hardwood trees such as jackfruit, avocado, durian, *sengon*, *africa*, mahogany, coconut, etc. as a protector of coffee plants, inter-garden boundaries, preventing landslides, and others. The community protects the surrounding forest land (*imbo*) because it is a garden reserve area, partly completely forbidden because there are historical sites and are awaited by spirits. Residents in opening the land to burn land but begins with a ritual |
| 4 | Sadei Rejang Babakan Baru | 1,291 | |
| 5 | Sadei Rejang Cawang Lama | 870 | |
| 6 | Sadei Rejang Kayu Manis | 2,141 | |
| 7 | Sadei Rejang Juru Kalang Kelurahan Topos | 1,556 | |

| | | | |
|---|---|---|---|
| | | | (*Kedurai*) and there are techniques to prevent land burning to spread to other people's land (*Ngepos*). Prohibition of opening a forest that has been cleared even though it has been left for a long time because the forest is considered to have had one owner. |
| 8 | Marga Sambat Sumber Harapan | 17 | Cannot cut down trees without community permission and be subject to the customary law of *Cempale Tangan.* Prohibition of opening the forest in certain slopes, such as on the edge of the river because it can pollute the river flow. In 2006 there was forest clearing to be used as land |
| 9 | Marga Sambat Muara Jaya | 101 | |
| 10 | Marga Sambat Linau | 1,126 | |
| 11 | Marga Sambat Air Long | 330 | |
| 12 | Dusun Marga Sambat Benteng Harapan | 76 | |

| | | | |
|---|---|---|---|
| | | | without asking permission in advance with customary institutions of the Marga Sambat Muara Jaya and the Marga Sambat Linau. From the results of customary deliberations, sanctions were imposed in the form of Jambar Turmeric Rice Chicken Cap, replanting trees that have been cut with multiples of 10 and apologizing to the community. |
| 13 | Serawai Lubuk Lagan | 2,011 | Prohibited from expanding the area of management in the form of clearing forest areas that are protected (*rintis*). Those who violate this provision will be subject to sanctions in the form of customary fines Rp. |
| 14 | Dusun Serawai Semidang Sakti | 1,786 | |
| 15 | Dusun Serawai Pasar Seluma | 2,860 | |

| | | | |
|---|---|---|---|
| | | | 25,000,000.00 (US$ 1,775); Revoked management rights; It is no longer permissible to manage land in a customary area, and is obliged to restore the land by planting trees ten times the number of trees cut down. |
| 16 | Semende Marge Muara Saung Bengkulu | 25 | It has a protected traditional forest area. In addition, residents also planted hard plants such as *petai*, durian and cat-eye resin |
| 17 | Dusun Semende Banding Agung | 3,483 | |
| | Total | 59,478 | |

Source: analyzed from data provided by BRWA, 2019

### *3.3. National Park and Conservation Area*

Bengkulu is the province with the highest number of conservation areas on the island of Sumatra. In this province, there are 34 conservation areas in various forms such as nature reserves, nature tourism parks, hunting parks, and community forest parks (Ministry of Environment and Forestry of Indonesia, 2017). This does not include the Kerinci Seblat National Park which is shared with three other

provinces in the north. In fact, the density of the number of conservation areas in Bengkulu is the third highest in Indonesia, with one conservation area every 565 $km^2$. The two more densely populated provinces are DKI Jakarta, one per 148 $km^2$ and DI Yogyakarta one per 448 $km^2$. Jakarta can be considered very reasonable because it is the country's capital while Yogyakarta is a very small province, with a size of only 16% of the size of Bengkulu.

The 34 area conservation areas in Bengkulu is actually very small compared to many other provinces. These areas are only 2.56% of the area of the province. Although it can be argued that what is more important is the size of the conservation area, the number of conservation areas has its own advantages. With so many conservation areas, conservation efforts are becoming more equitable, run by various levels of government, and witnessed by more members of the community. That is, socially, the quantity of conservation areas provides higher security than a single vast area. Even if the area is taken into account, the area of the conservation area in Bengkulu province is actually very large if the Kerinci Seblat National Park is included. The total area of 34 conservation areas plus the Kerinci Seblat National Park reaches 20.12% of Bengkulu province. This province is the second largest in Indonesia in terms of conservation areas after Papua (22.53%).

Table 3: Number and Size of Conservation Zones

| | **Province** | **Number** | **Conservation Size (Ha)** | **Percent of Area** |
|---|---|---|---|---|
| 1 | Aceh (A) | 12 | 981.859 | 17,12 |
| **2** | North Sumatra (NSM) | 25 | 507.498 | 6,95 |
| 3 | West Sumatra (WSM) | 33 | 772.771 | 18,27 |
| 4 | Riau (R) | 19 | 595.835 | 6,30 |
| 5 | Jambi (J) | 13 | 626.151 | 11,70 |
| 6 | Bengkulu (BG) | 35 | 398.120 | 20,12 |
| 7 | South Sumatra (SSM) | 10 | 886.413 | 10,35 |
| 8 | Lampung (L) | 6 | 493.227 | 13,94 |
| 9 | Riau Islands (RI) | 5 | 12.349 | 1,53 |
| 10 | Bangka Belitung Islands (BBI) | 6 | 35.708 | 2,17 |
| 11 | Banten (BN) | 7 | 163.977 | 18,18 |
| 12 | Jakarta (CC) | 5 | 11.198 | 15,13 |
| 13 | West Java (WJ) | 49 | 164.786 | 4,68 |
| 14 | Central Java (CJ) | 38 | 28.596 | 0,84 |
| 15 | Yogyakarta (Y) | 7 | 4.528 | 1,45 |
| 1 | East Java (EJ) | 31 | 252.687 | 5,27 |

| | | | | |
|---|---|---|---|---|
| 16 | | | | |
| 17 | Bali (BL) | 7 | 26.040 | 4,68 |
| 18 | West Nusa Tenggara (WSEI) | 21 | 183.730 | 9,21 |
| 19 | East Nusa Tenggara (ESEI) | 36 | 497.369 | 10,43 |
| 20 | West Kalimantan (WK) | 17 | 1.759.443 | 15,28 |
| 21 | Central Kalimantan (CK) | 14 | 1.498.428 | 9,76 |
| 22 | South Kalimantan (SK) | 18 | 214.129 | 5,82 |
| 23 | East Kalimantan (EK)* | 10 | 1.717.531 | 8,81 |
| 24 | North Sulawesi (NSL) | 12 | 203.673 | 14,62 |
| 25 | Central Sulawesi (CSL) | 21 | 991.013 | 14,55 |
| 26 | South Sulawesi (SSL) | 17 | 288.911 | 6,26 |
| 27 | Southeast Sulawesi (SESL) | 15 | 419.143 | 11,40 |
| 28 | Gorontalo (G) | 5 | 234.119 | 19,56 |

| | | | | |
|---|---|---|---|---|
| 29 | West Sulawesi (WSL) | 2 | 214.950 | 12,80 |
| 30 | Maluku (M) | 24 | 433.375 | 8,78 |
| 31 | North Maluku (NM) | 7 | 219.102 | 5,10 |
| 32 | Papua (P) | 22 | 6.984.054 | 22,53 |
| 33 | West Papua (WP) | 25 | 2.093.340 | 18,27 |
| | Total | 566 | | |

Notes: * including newly created province, North Kalimantan; source: data analyzed from Ministry of Forestry and Environment, 2017 by splitting shared national parks area according to member provinces and excluding sea-based national parks; number didn't add to total since there are several shared areas.

*3.4. Palm Oil Plantation*

In Indonesia, palm oil companies are often blamed for causing forest and land fires. Bengkulu contains enough oil palm land. In 2015, 14.7% of the province's area was oil palm plantations. In 2019, this number reaches 19.05%, indicating an increase of 87,138 Ha of new oil palm lands (Ministry of Agriculture of Indonesia, 2019). Bengkulu oil palm growth patterns are relatively similar to the growth patterns of national oil palm lands (Figure 4).

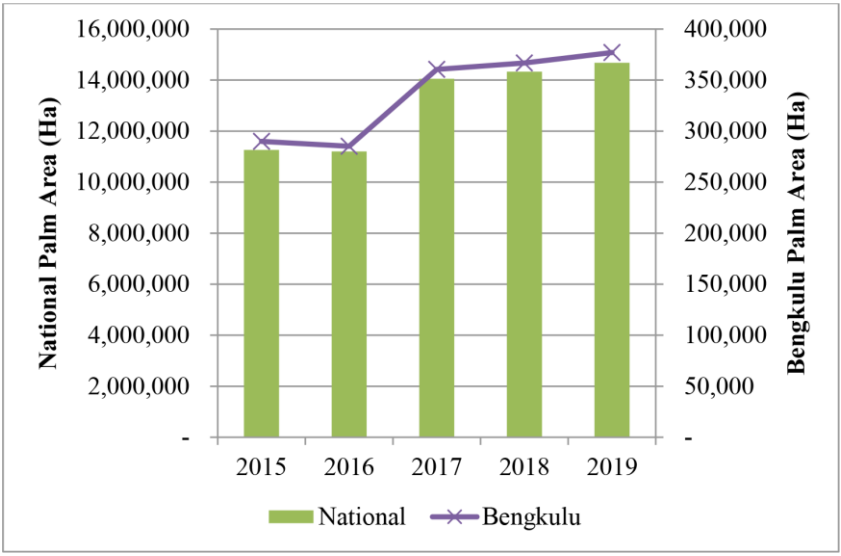


Figure 4: Growth of Indonesia and Bengkulu Palm Oil Area (Ministry of Agriculture of Indonesia, 2019)

The first oil palm fields in Bengkulu were built in the 1980s on previously degraded land and developed in significant quantities in the North Bengkulu region (Tomita, 2017). Handling fires to protect the interests of oil palm plantations is carried out by the company and smallholder oil palm growers to protect their plantations. Although it is not known whether this land was originally built by burning, its existence should now contribute to the low level of land burnt by 2019.

Table 4: Size of Palm Plantation 2019

| | **Province** | **Palm Oil (Ha)** | **Percent of Palm Oil to Province Area** |
|---|---|---|---|
| 1 | Aceh (A) | 566,378 | 9.87% |
| 2 | North Sumatra (NSM) | 1,773,049 | 24.29% |
| 3 | West Sumatra (WSM) | 508,974 | 12.03% |
| 4 | Riau (R) | 2,806,349 | 29.68% |
| 5 | Jambi (J) | 931,790 | 17.41% |
| 6 | Bengkulu (BG) | 377,052 | 19.05% |
| 7 | South Sumatra (SSM) | 1,220,468 | 14.24% |
| 8 | Lampung (L) | 278,110 | 7.86% |
| 9 | Riau Islands (RI) | 24,834 | 3.07% |
| 10 | Bangka Belitung Islands (BBI) | 275,131 | 16.75% |
| 11 | Banten (BN) | 20,989 | 2.33% |

| | | | |
|---|---|---|---|
| 12 | Jakarta (CC) | - | 0.00% |
| 13 | West Java (WJ) | 17,907 | 0.51% |
| 14 | Central Java (CJ) | - | 0.00% |
| 15 | Yogyakarta (Y) | - | 0.00% |
| 16 | East Java (EJ) | - | 0.00% |
| 17 | Bali (BL) | - | 0.00% |
| 18 | West Nusa Tenggara (WSEI) | - | 0.00% |
| 19 | East Nusa Tenggara (ESEI) | - | 0.00% |
| 20 | West Kalimantan (WK) | 1,570,675 | 13.64% |
| 21 | Central Kalimantan (CK) | 1,532,734 | 9.98% |
| 22 | South Kalimantan (SK) | 605,449 | 16.45% |
| 23 | East Kalimantan (EK)* | 1,365,821 | 7.01% |
| 2 | North Sulawesi | | 0.00% |

| | | | |
|---|---|---|---|
| 4 | (NSL) | - | |
| 25 | Central Sulawesi (CSL) | 191,102 | 2.81% |
| 26 | South Sulawesi (SSL) | 66,798 | 1.45% |
| 27 | Southeast Sulawesi (SESL) | 74,900 | 2.04% |
| 28 | Gorontalo (G) | 18,494 | 1.55% |
| 29 | West Sulawesi (WSL) | 205,251 | 12.23% |
| 30 | Maluku (M) | 14,565 | 0.30% |
| 31 | North Maluku (NM) | 7,676 | 0.18% |
| 32 | Papua (P) | 125,606 | 0.41% |
| 33 | West Papua (WP) | 97,459 | 0.85% |
| | Total | 14,677,561 | 7.72% |

Notes: * including newly created province, North Kalimantan; source: data analyzed from Ministry of Agriculture, 2019

### *3.5. International Cooperation*

International cooperation in disaster mitigation can transfer knowledge from countries that have been successful in handling disasters to countries that are still learning to deal with it. On the advice of the central government, Bengkulu provincial government implemented disaster diplomacy through disaster relief cooperation with New Zealand. The collaboration was specifically carried out with New Zealand to map the potential for disaster in Bengkulu in detail, including the potential for forest fires. The collaboration is carried out within the framework of STIRRD (Strengthened Indonesian Relationship: Reducing Risk from Disasters). In fact, the focus of the collaboration between Bengkulu and the three other participating provinces (Central Sulawesi, West Nusa Tenggara, and West Sumatra) was more focused on tsunami risk. Even so, the resulting action plan involves disaster risk reduction for all possible disasters. Included in this action plan include the creation of a policy framework, firefighting training, and reforestation, especially in the areas of Bengkulu City and Seluma District (StiRRRD, 2015b, 2015a, 2015c, 2016).

## 4. DISCUSSIONS

The above results show that the prevention of forest and land fires in Bengkulu can be overcome by the role of stakeholders such as governments at various levels, regional heads, the wider community, the media, indigenous peoples, the private sector in agriculture, and the international community. Governments at the central and regional

levels create conservation areas that protect forests from damage. The regional head holds the role of role model and mobilizer for the community to care for and be alert to forest fires. The media becomes a supporter by spreading information, even information that is not directly related to a disaster such as the leader's actions. Indigenous peoples protect the forests in their interests, as does the private sector. In this case, only the palm oil business operators were reviewed, but the business actors in the timber sector also had an interest in preventing forest fires (Wan *et al.*, 2017). The international community helps by providing input on important and applicable techniques and other academic inputs.

The participation of various stakeholders is in line with stakeholder theories that are commonly used in forest fire management (Hesseln, 2018). Interestingly, these stakeholders do not have to collaborate to prevent forest fires. Indigenous peoples do not collaborate with the government to protect their forests, they even sometimes conflict with the government about which are customary lands and which are national parklands. Even so, both the government, indigenous peoples, and private companies, both protect their interests so as to guard the forest from fire. Although fires do not occur in the area, other stakeholders will also help extinguish the fire for fear of spreading to the area.

In certain aspects, cooperation has its own problems (Eckerberg and Buizer, 2017). Although collaboration between stakeholders is important to increase social capital in preventing forest fires, this

requires an appreciation of property rights and risks posed by collaborating parties (Hesseln, 2018).

Even so, for relatively similar stakeholders, collaboration can be very helpful, including in a multi-structured environment (Larionov, 2015). This is for example in the form of cooperation between customary areas, between companies, or between levels of government (Panjaitan *et al.*, 2019). The media can also work with various parties because of its universal nature. Meanwhile, the community around the company can help the company jointly prevent forest fires (Fernandes, Panjaitan and Solimun, 2018).

It is also possible that what happened in Bengkulu is actually not a best practice, but a final moment in the forest transition. According to the forest transition theory, the forest will first lose its size, then arrive at the minimum point and then revive and stabilize at a certain point, and this process occurs naturally (Ametepeh, 2019). Viewed from the perspective of this theory, Bengkulu is likely to have passed its minimum point and is in a stable position. That is, Bengkulu actually has felt what happened in other provinces and has now successfully passed it and arrived at the point that will one day be reached by other provinces that are currently in a 'burning' condition.

If this theory is correct, then what must be done now is to accelerate other provinces to arrive at a stable point. Learning from Bengkulu, various steps that encourage stakeholder involvement to need to be encouraged. Various parties must be made aware of the risks they face if there is a forest fire and their rights are recognized to be able to participate either through independent actions or in

collaboration to prevent forest fires (Emerson, Nabatchi and Balogh, 2011). Stakeholders must be expanded to include indigenous groups in handling forest fires. This is important because expanded stakeholder inclusion can help in improving risk governance (Suman, 2019). In addition, the network governance that emerges in fire disaster management situations (Pheungpha *et al.*, 2019; Rhama & Reindrawati, 2019) can be extended so that the same network can act as fire prevention in the future.

## 5. CONCLUSION

This research identifies five factors that support Bengkulu in suppressing forest and land fires in its region. First, the role of effective media in framing the actions taken by the central government. Basically, the actions taken by the governors in all provinces affected by the risk of forest fires are more or less the same because administratively, the actions of the governor get orders from the central government in Jakarta. But the framing made strengthens the governor and makes him a figure who works directly at the lowest level in the province. Second, local wisdom works well to protect indigenous areas. Indigenous peoples work to protect their area from forest fires through rules passed down from generation to generation. Third, there are large and widespread conservation areas which increase the narrow possibility of forest burners to work, managed by both the central and regional governments. Not only does Bengkulu have the largest conservation area in Indonesia, relative to the size of

the province, Bengkulu also has the largest number of conservation areas in Indonesia. Fourth, the private sector also seems to take a role to protect its interests when viewed from the extent of oil palm plantations in Bengkulu province. Fifth, international cooperation enables the strengthening of local government capacity in managing disasters through various training and design of regional policies. These five factors may not be unique to Bengkulu but Bengkulu is able to execute them well and achieve high effectiveness in reducing forest and land fire disasters.

The findings of this study reinforce the importance of stakeholder involvement in preventing forest and land fires. Theoretically, the implications of this study show that the role of stakeholders in preventing forest fires can be done without having to establish cooperation and even in situations of conflict with other interests. Some indigenous peoples actually have land disputes with the Kerinci Seblat National Park area, but they still maintain their traditions to prevent forest fires and land damage. This contributes to the development of stakeholder theory in the context of sustainability.

The overall practical implication of this research is the importance of stakeholder-based forest fire prevention management as an approach that can strengthen the participation of all parties. Recognition of the area and awareness of the risks that can occur for all parties if not involved in preventing forest fires is crucial to encourage cooperation between parties as well as independent actions of the parties involved in preventing forest fires.

Recommendations made in previous studies include policy, technological, economic, and social solutions (Fernandes, Panjaitan and Solimun, 2018; Goldstein, 2019; Edwards *et al.*, 2020). Research now recommends solutions that tend more toward social and environmental solutions. The social solutions put forward by increasing the active involvement of the media in designing strong framing in mobilizing communities, and recognizing and increasing the awareness of the community, the private sector, and indigenous peoples on the importance of preventing forest fires. The environmental solution, of course, is to build more conservation areas scattered in many locations equipped with capable human resources in carrying out environmental monitoring, conducting socialization with the community, and using existing resources, including social resources, to prevent fires and extinguish fires.

There are a number of limitations to this study. Because this research is based on a literature review, there is no guarantee that the Bengkulu case can also be applied to the case of other provinces in Indonesia, as well as in other countries that face a situation of forest fires. Therefore, the generalization of this research is still limited and further research involving more generalized methods can be carried out. Research now provides a number of variables that can be tested quantitatively such as paternalistic leadership, the power of customary law, the size of customary land, the number of customary lands, the area of agricultural land, the size of the protected area, the number of protected areas, and so on.

The data used in this study are secondary and qualitative mixed data. This secondary data does not necessarily represent the actual conditions in the field. More complex field situations can be observed if the research focuses on observational methods or case studies on a narrower scope, for example in certain customary areas, certain oil palm companies, or certain districts.

The last limitation that needs to be recognized in this study was the lack of a comparison with the situation in other provinces, the provincial who was also successful in preventing the burning of land and burned provinces. Framing in the Kalimantan region, for example, can also be positive but not able to prevent fires that occur in the region. Likewise, there are actually far more customary areas in Kalimantan than in Bengkulu. But it is assumed that indigenous peoples are less effective in preventing forest fires in the area. This is only based on the experience of researchers at that location because there is no literature that actually examines the effectiveness of local wisdom in Kalimantan which is effective in preventing forest and land fires. Future studies need to explore local wisdom in 'burning' areas and explain why this local wisdom is unable to prevent the area from burning.

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