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Forest and Land Fire Management Strategy in South Sumatra Province through the Penta Helix Model

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ABSTRACT

Aiming to find out the Forest and Land Fire Management Strategy in South Sumatera Province through the Penta Helix Model, the strategy parameters according to Geoff Mulgan are measured using 5 indicators, namely: Purposes, Environment, Direction, Action, and Learning, the author concludes that the Forest and Land Fire Management Strategy in South Sumaetra Province through the Penta Helix Model has not been successful. This is due to several things as follows: 1) actions to overcome forest and land fires have not been optimal, resulting in forest and land fires continuing to occur; 2) human activities that still clear land by burning; 3) weather conditions or the dry season and even forest and land fire incidents increase during the El Nino phenomenon; 4) community participation in preventing forest and land fires is not yet optimal.

Introduction

As an agrarian country, Indonesia is rich in natural resources, one of which is the forestry sector. Forests are a gift and mandate of God Almighty given to this nation to be used as much as possible for the prosperity of the country. Forests that are dense, green, lush, and biodiverse must be grateful and managed properly by the principles of sustainable development. South Sumatra Province is one of the provinces on the island of Sumatra that has a very large forest. According to data from South Sumatra Province, the number of forests and waters in South Sumatra Province in 2022 was recorded as 3. 334. 316.58 hectares. With the area of the forest, the chance of forest and land fires is very likely to occur considering that we enter the dry season with hot and dry air conditions. (Service Forestry Province Sumsel, 2022).

Apart from Indonesia, forest and land fires also occur in several countries in the continental hemisphere such as Asia, America, Europe, and Africa. Here's a table of the world's countries hit by forest and land fires in 2019: The handling of forest and land fires in the United States emphasizes prevention. The fundamental concept of forest and

land fire control is in several elements. These elements include command transfer, a command unit, a chain of command, primary goal-based management, common operations overview, learning, and operations planning. In the context of operational planning, he explained P-planning or P-planning. Integrated planning helps in achieving goals effectively and quickly (Clark & Pietsch, 2018).

Other countries such as Australia also experience forest and land fires with very dry air conditions in the areas that experience fires. Australia's outback towns have even given up their very limited water supplies to fight fires. Firefighters there have used dry extinguishing techniques, which are to create barriers to prevent the burning of organic matter.

Dry extinguishing techniques are carried out using hand tools including hoes, making fire suppression lines, and using fire retardants. They used excavators and bulldozers to create a 20-meter-wide strip around the blaze. This strategy will be even more important considering that the new summer will last in the coming months. The Fire Service in the state of New South Wales (NSW) is also considering dry extinguishing techniques.

Extinguishing techniques with helicopters and water bomb aircraft that are increasingly used are considered unsustainable and expensive. The fire situation is a momentum to change the approach in efforts to overcome forest and land fires. Land for residential housing and how to build houses now need to be reviewed. The landscape in which we live is increasingly dangerous with the arrival of climate change, Firefighters have witnessed fire behaviour beyond their imagination and this is not just happening in Australia. This is what climate change looks like and we need to understand what's happening (Liputan6.com, 2019).

Portugal, which has been hit by forest and land fires, prompted Portugal's Interior Minister to resign after dozens of people died in major wildfires. Portugal's second major wildfire this year – after last June – left 41 people dead and hundreds injured others. Four other people died in Spanish territory, which borders Portugal. Portugal's president, Marcelo Rebelo de Sousa, has called for the government to be given a strong mandate to implement reforms in forest fire management and forest management to prevent similar incidents from happening again. The wildfires in June left 64 dead and 250 injured, making it by far the worst wildfire in Portugal. (BBC, 2017)

Forest and land fires that occurred in Indonesia from June to October 2015 cost financial losses of up to Rp 221 trillion. This amount is outside the calculation of losses in health, education, germplasm, carbon emissions, and other sectors. The loss is higher than a similar incident in 1997 where forest and land fires cost the country up to Rp 60 trillion. As is known, during that period there were compact forest and land fires in Jambi, Riau, South Sumatra, South Kalimantan, West Kalimantan, and East Kalimantan. The causes are deliberate burning, new land clearing by some communities, poor management of peat swamp ecosystems, long dry seasons due to El Nino, and weak supervision.

To overcome this, BNPB spent Rp 720 billion on firefighting. The cost is outside of the funds issued by the Ministry of Environment and Forestry (MoEF), the Ministry

of Public Works and Public Housing (Kemenpupera), and the Ministry of Health. The impact of forest fires, he continued, recorded 24 deaths, more than 600 thousand people infected with Upper Respiratory Tract Infection (ISPA), 60 million people exposed to smoke, and as many as 2.61 million hectares of forests and land burned. Of the 2.61 million hectares of land that were burned, 33 percent were affected by peatland, aka an area of 869,754 hectares. Meanwhile, the fire in mineral land covering an area of 1,741,657 hectares or 67 percent of the (Diar et al., 2016).

The geographical condition of the South Sumatra region where the land is partly peatty causes fires during the dry season to be very difficult to extinguish. Ogan Komering Ilir, Musi Banyuasin, Ogan Ilir, Banyuasin, Muara Enim, Penukal Abab Lematang Ilir (PALI), Musi Rawas, Musi Rawas Utara are areas that have peat. With many peatland areas, the potential for forest and land fires to expand is very likely.

Based on the report on the implementation of the haze disaster emergency response task force due to forest and land fires in 2019, the area of fires with peatland types covers an area of 254,164 hectares, and non-peatlands cover an area of 174,192 hectares. This indicates that fires in peatlands are larger and will take a long time to deal with them and require more resources in terms of funding, facilities and infrastructure, human resources/personnel, and the right strategy. Forest and land fires are a natural phenomenon that often occurs because they include various factors, data shows that the main factor causing forest and land fires is humans. This comes from land-clearing activities carried out by the community for the management of agricultural fields to improve the economic level of the community itself. The next factor that causes forest and land fires is the dry season. The weather will become very hot in the dry season which causes the soil to dry out very quickly and lose moisture, so that it can trigger fires until forest and land fires occur. In addition to these two factors, other factors cause forest and land fires, but still come from human hands, for example, due to the disposal of cigarette butts. (TATA et al., 2018); (Thoha et al., 2019); (Kumalawati et al., 2021); (Oktoriana & Hazriani, 2020).

From the phenomenon of forest and land fires that occur, both in Ogan Ilir Regency and other areas, there will be a lot of impacts and losses for various aspects. However, the negative impact is much more starting from the health sector, which causes respiratory tract infections. Then from the economic sector, the state has to spend a lot of funds which has an impact on people's incomes (Purnomo, 2017). Furthermore, forest and land fires have an impact on the aviation sector, namely limited visibility of pilots due to haze caused by forest and land fires and worse caused violent protests from neighboring countries, as happened in 2015 Indonesia received protests from Singapore and Malaysia due to the large amount of smoke from forest and land fires to obscure the view (Marlina, 2020).

The number of forest and land fires in South Sumatra tends to increase every year. In dealing with the haze disaster caused by forest and land fires, it is necessary to involve all elements of the government (including the TNI & Polri), the community, the business world, the media, and even universities known as the Penta helix model. Dealing with haze disasters caused by forest and land fires requires complexity and the

involvement of all elements. Synergy with related parties is a form of collaboration in overcoming any disasters, including forest and land fires that often occur in the South Sumatra Province area in particular.

To control forest and land fires, the South Sumatra Provincial Government has made Regional Regulation No. 8 of 2016 concerning Forest and/or Land Fire Control. This policy is expected to be a reference in the implementation of forest and land fire control. For this reason, it is considered necessary to measure the extent to which the implementation of the policy is implemented in practice in the field, considering that forest and land fires continue to occur every year.

Various efforts have been made by the government in overcoming haze disasters caused by forest and land fires, all elements must be involved in forest and land fire management. Based on data on forest and land fire disasters in South Sumatra Province in 2022, the number of forest and land fire incidents was recorded at 609. So far, the handling of forest and land fires seems to be only sporadic and mobile when emergency response situations are carried out. As a result, forest and land fires are not resolved and the pressure on Indonesia is increasing. Indonesia's inability to overcome forest and land fires will have a bad effect on diplomacy with other countries, both economic, social, political, and even drought diplomacy. Forest and land fires can occur every dry season, and they can occur every year. The actions as mentioned earlier must be organized starting from pre-disaster, emergency response, and post-disaster. Moreover, as a consequence of this external strategic environment, it is very possible to involve various countries in preventive efforts. This confirms once again that the problem of forest and land fires is a cross-country problem, this will and has even become a global issue. (Agus et al., 2020).

Forest and land fire control involving multiple sectors is considered more optimal. By using the Penta helix concept, forest, and land fire control is intended to be even better. Research on the concept of pentahelix related to forest and land fire management is considered an ideal tool and the context of forest and land fires whose problems are more complex and until now have not found the right formulation in the management of forest and land fires that occur every year in the South Sumatra region.

The important results and recommendations of this study are that the collaboration of the Pentahelix model in the development of the Harapan Jaya Tourism Village needs special attention and the lack of communication between actors regarding the Harapan Jaya Tourism Village. The low funding and management ability as well as the creativity of skilled human resources in striving to make local tourism industry products, especially regarding the handicraft and souvenir industry, also affect the suboptimal level of penthelix collaboration in the development of the Harapan Jaya tourism village. The research of the pentahelix model related to forest and land fire management has not been researched or the study is still very minimal, so the author is interested in conducting research on forest and land fire management from a pentahelix perspective. The concept of pentahelix was taken by researchers because this model is considered suitable and more complex in dealing with forest and land fires that occur every year in South Sumatra Province. From the description above, the author wants to better

understand and analyze forest and land fire management in South Sumatra Province through the Penta helix model. For this reason, the author is interested in taking the title "Forest and Land Fire Management Strategy in South Sumatra Province through the Penta Helix Model".

The purpose of this study is to find out the strategy of forest and land fire management in South Sumatra Province from the perspective of penta helix; to find out what factors cause forest and land fire management in South Sumatra Province that are not optimal; to find out the efforts to control forest and land fires in South Sumatra Province from the perspective of penta helix.

Method

This research uses a qualitative method. The focus of the research will sharpen the discussion of the research questions so that data collection, both interviews, secondary data, observation, and analysis of research results is more directed. This research unit is the provincial government (BPBD, Plantation Service, Agriculture Service, Plantation Service, Forestry Service, Village Community Empowerment Service, Environment Service, Sumatra Regional Climate Change Control Center, Korem 044 GAPO and South Sumatra Police), Business World (Indonesian Forest Entrepreneurs Association and the Association of Palm Oil Entrepreneurs Association), Academics (Sriwijaya University), Community Organizations (WALHI) and mass media (Sumeks, Detik Sumbagsel). The technique of withdrawing informants is carried out by purposive sampling, which is by the characteristics that have been made by researchers, including the government, the business world, academics, the community, and the mass media. (Creswell & Poth, 2016). The primary data of this study was obtained by conducting interviews. In-depth interviews will be conducted with all informants in this study. Secondary data is data that is not obtained directly from the data source. The data and information that have been collected are then analyzed using the data analysis techniques used by Miles and Huberman.

Results and Discussion

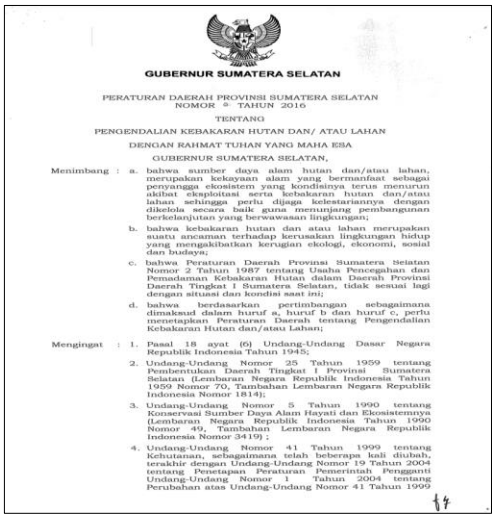
Model Penta Helix

In the Penta helix model used for forest and land fire management, the government plays a central role as a coordinator and policy maker. The involvement of various government agencies such as BPBD, Forestry Service, Plantation Service, and others as outlined in this study illustrates the important role of the government in this model as follows:

1. The role of regulators and policymakers

The government is responsible for making and enforcing regulations that support the prevention of forest and land fires, such as land use supervision, prohibition of forest burning, and sanctions against perpetrators who violate the rules. In this case, the

government through the Forestry Service and the South Sumatra DPRD has initiated the creation of Regional Regulation (Perda) of South Sumatra Province Number 8 of 2016 concerning Forest and/or Land Fire Control. On the other hand, the South Sumatra Regional Police has issued a Joint Proclamation on the prohibition of clearing land by burning.



GUBERNUR SUMATERA SELATAN

PERATURAN DAERAH PROVINSI SUMATERA SELATAN
NOMOR ... TAHUN 2016

TENTANG

PENGENDALIAN KEBAKARAN HUTAN DAN/ ATAU LAHAN

DENGAN RAHMAT TUHAN YANG MAHA ESA

GUBERNUR SUMATERA SELATAN,

Menimbang : a. bahwa sumber daya alam hutan dan/atau lahan, merupakan kekayaan alam yang bermanfaat sebagai penyangga ekosistem yang kondisinya terus menurun akibat eksploitasi serta kebakaran hutan dan/atau lahan sehingga perlu dijaga kelestariannya dengan dikelola secara baik guna menunjang pembangunan berkelanjutan yang berwawasan lingkungan;

b. bahwa kebakaran hutan dan atau lahan merupakan suatu ancaman terhadap kerusakan lingkungan hidup yang mengakibatkan kerugian ekologi, ekonomi, sosial dan budaya;

c. bahwa Peraturan Daerah Provinsi Sumatera Selatan Nomor 2 Tahun 1987 tentang Usaha Pencegahan dan Pemadaman Kebakaran Hutan dalam Daerah Provinsi Daerah Tingkat I Sumatera Selatan, tidak sesuai lagi dengan situasi dan kondisi saat ini;

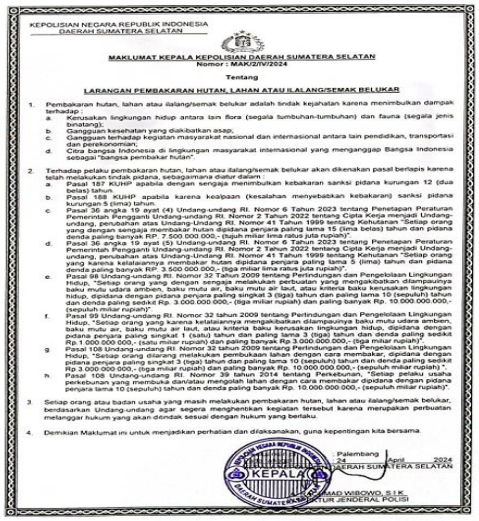
d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a, huruf b dan huruf c, perlu menetapkan Peraturan Daerah tentang Pengendalian Kebakaran Hutan dan/atau Lahan;

Mengingat : 1. Pasal 18 ayat (6) Undang-Undang Dasar Negara Republik Indonesia Tahun 1945;

2. Undang-Undang Nomor 25 Tahun 1959 tentang Pembentukan Daerah Tingkat I Provinsi Sumatera Selatan (Lembaran Negara Republik Indonesia Tahun 1959 Nomor 70, Tambahan Lembaran Negara Republik Indonesia Nomor 1814);

3. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya (Lembaran Negara Republik Indonesia Tahun 1990 Nomor 49, Tambahan Lembaran Negara Republik Indonesia Nomor 3419) ;

4. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah beberapa kali diubah, terakhir dengan Undang-Undang Nomor 19 Tahun 2004 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 1 Tahun 2004 tentang Perubahan atas Undang-Undang Nomor 41 Tahun 1999



KEPOLISIAN NEGARA REPUBLIK INDONESIA
DAERAH SUMATERA SELATAN

MAKLUMAT KEPALA KEPOLISIAN DAERAH SUMATERA SELATAN
Nomor : MAK/2/IV/2024

Tentang

LARANGAN PEMBAKARAN HUTAN, LAHAN ATAU ILALANG/SEMAK BELUKAR

1. Pembakaran hutan, lahan atau ilalang/semak belukar adalah tindak kejahatan karena menimbulkan dampak terhadap :
   a. Kerusakan lingkungan hidup antara lain flora (segala tumbuhan-tumbuhan) dan fauna (segala jenis binatang);
   b. Gangguan kesehatan yang diakibatkan asap;
   c. Gangguan terhadap kegiatan masyarakat nasional dan internasional antara lain pendidikan, transportasi dan perekonomian;
   d. Citra bangsa Indonesia di lingkungan masyarakat internasional yang menganggap Bangsa Indonesia sebagai "bangsa pembakar hutan".

2. Terhadap pelaku pembakaran hutan, lahan atau ilalang/semak belukar akan dikenakan pasal berlapis karena telah melakukan tindak pidana, sebagaimana diatur dalam :
   a. Pasal 187 KUHP apabila dengan sengaja menimbulkan kebakaran sanksi pidana kurungan 12 (dua belas) tahun.
   b. Pasal 188 KUHP apabila karena kealpaan (kesalahan menyebabkan kebakaran) sanksi pidana kurungan 5 (lima) tahun.
   c. Pasal 36 angka 19 ayat (4) Undang-undang RI. Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-undang RI. Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang-undang, perubahan atas Undang-Undang RI. Nomor 41 Tahun 1999 tentang Kehutanan "Setiap orang yang dengan sengaja membakar hutan dipidana penjara paling lama 15 (lima belas) tahun dan pidana denda paling banyak RP. 7.500.000.000,- (tujuh miliar lima ratus juta rupiah)".
   d. Pasal 36 angka 19 ayat (5) Undang-undang RI. Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-undang RI. Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang-undang, perubahan atas Undang-Undang RI. Nomor 41 Tahun 1999 tentang Kehutanan "Setiap orang yang karena kelalaiannya membakar hutan dipidana penjara 5 (lima) tahun dan pidana denda paling banyak RP. 3.500.000.000,- (tiga miliar lima ratus juta rupiah)".
   e. Pasal 98 Undang-undang RI. Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, "Setiap orang yang dengan sengaja melakukan perbuatan yang mengakibatkan dilampauinya baku mutu udara ambien, baku mutu air, baku mutu air laut, atau kriteria baku kerusakan lingkungan hidup, dipidana dengan pidana penjara paling singkat 3 (tiga) tahun dan paling lama 10 (sepuluh) tahun dan denda paling sedikit Rp. 3.000.000.000,- (tiga miliar rupiah) dan paling banyak Rp. 10.000.000.000,- (sepuluh miliar rupiah)".
   f. Pasal 99 Undang-undang RI. Nomor 32 tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, "Setiap orang yang karena kelalaiannya mengakibatkan dilampauinya baku mutu udara ambien, baku mutu air, baku mutu air laut, atau kriteria baku kerusakan lingkungan hidup, dipidana dengan pidana penjara paling singkat 1 (satu) tahun dan paling lama 3 (tiga) tahun dan denda paling sedikit Rp.1.000.000.000,- (satu miliar rupiah) dan paling banyak Rp.3.000.000.000,- (tiga miliar rupiah)".
   g. Pasal 108 Undang-undang RI. Nomor 32 tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, "Setiap orang dilarang melakukan pembukaan lahan dengan cara membakar, dipidana dengan pidana penjara paling singkat 3 (tiga) tahun dan paling lama 10 (sepuluh) tahun dan denda paling sedikit Rp.3.000.000.000,- (tiga miliar rupiah) dan paling banyak Rp. 10.000.000.000,- (sepuluh miliar rupiah) ".
   h. Pasal 108 Undang-undang RI. Nomor 39 tahun 2014 tentang Perkebunan, "Setiap pelaku usaha perkebunan yang membuka dan/atau mengolah lahan dengan cara membakar dipidana dengan pidana penjara lama 10 (sepuluh) tahun dan denda paling banyak Rp. 10.000.000.000,- (sepuluh miliar rupiah)"

3. Setiap orang atau badan usaha yang masih melakukan pembakaran hutan, lahan atau ilalang/semak belukar, berdasarkan Undang-undang agar segera menghentikan kegiatan tersebut karena merupakan perbuatan melanggar hukum yang akan dindak sesuai dengan hukum yang berlaku.

4. Demikian Maklumat ini untuk menjadikan perhatian dan dilaksanakan, guna kepentingan kita bersama.

Palembang, 24 April 2024
KEPALA
KEPOLISIAN DAERAH SUMATERA SELATAN
AHMAD WIBOWO, S.I.K.
INSPEKTUR JENDERAL POLISI

2. Inter-Agency Coordination

The government acts as a liaison between various elements in pentahelix. They facilitate coordination between the community, academia, the business world, and the media, ensuring that each party plays its role in a joint effort to prevent and overcome forest and land fires. Coordination between Institutions is overseen by the Governor's Decree on the establishment of the Haze Disaster Emergency Preparedness Command Post due to Forest and Land Fires. In the post, all elements have been involved. However, in this structure, the involvement of community organizations in forest and land fire management has not been seen. This is important because the occurrence of forest and land fires occurs in areas/villages, for this reason, it is considered necessary to involve community organizations such as Rawang Nusantara and WALHI who are engaged in the environmental sector and are intensely concerned about the occurrence of haze in South Sumatra. With the involvement of these organizations, at least there is a contribution from the community in providing appropriate and effective solutions in handling forest and land fires.

3. Capacity Building and Technology Facilitation

The government can provide training to the community and increase the capacity of human resources at the local level to be more responsive to potential disasters. This is a form of capacity building in the community, such as the formation of the Fire Care Community (MPA) initiated by various agencies such as the Plantation Service involving the Company, BPBD through the Disaster Resilient Village Program. The government can also facilitate the use of technology such as drones, satellites, and forest fire monitoring applications such as the Songket Application (Forest and Land Fire

Control Operating System) developed by the Communication and Informatics Service and involving related agencies such as the Forestry Service.

4. Provision of Resources and Infrastructure

The government provides budgets, tools, and other resources to support efforts to prevent and extinguish forest and land fires. BPBD has disrupted extinguishing facilities such as the provision of pumps, hoses, and personnel in ground firefighting operations. In addition, it is also the role of the DPRD to approve the budget for forest and land fire management in various agencies such as the Environment Agency through the forest and land fire prevention campaign program. The Forestry Service and the Plantation Service encourage the role of companies to assist in building supporting infrastructure, such as the provision of water reservoirs, forest fire stations, watchtowers, and evacuation routes.

5. Education and Socialization

The government has an important role in socializing the dangers of forest and land fires and encouraging changes in community behavior through forest fire prevention campaigns. This can be through direct education programs or in collaboration with the media. Socialization of forest and land fire prevention carried out by the Environment Service, TNI, POLRI, Forestry Service, Agriculture Service, and BPBD in general has been carried out to the maximum. The use of technology digitally through social media is often carried out by BPBD, Kominfo, TNI, POLRI, Environment Service, Plantation Service, and Forestry Service.

6. Quick Response and Emergency Response to Forest and Land Fire Incidents.

In emergencies, BPBD is responsible for mobilizing disaster response teams and resources to extinguish fires and evacuate residents if needed. In terms of response to forest and land fires, the government through air and land task forces has tried to extinguish them as early as possible. This can be seen from the number of fire helicopters and the presence of personnel in the field in terms of following up on forest and land fire information. The following is data on the Water Bombing Operation in South Sumatra in 2024.

Table 1
Number of Water Bombing Helicopters Flying

NO	KABUPATEN/KOTA	JUMLAH LOKASI	BOMBING	TOTAL AIR
1	BANYUASIN	124	3.548	14.672.000
2	MUARA ENIM	107	3.741	15.388.000
3	MURATARA	6	116	464.000
4	MUSI BANYUASIN	139	3.733	15.041.000
5	MUSI RAWAS	11	211	844.000
6	OGAN ILIR	69	2.049	8.285.000
7	OKI	71	1.782	7.183.000
8	OKU TIMUR	7	254	1.016.000
9	PALEMBANG	6	95	380.000
10	PALI	64	1.778	7.112.000
TOTAL		**604**	**17.307**	**70.385.000**

TMT : 19 JULI 2024 S/D 26 SEPTEMBER 2024
JUMLAH SORTI TERBANG HELI WATER BOMBING : 575 SORTI
TOTAL JAM TERBANG HELI WATER BOMBING : 2169:47:00
JUMLAH SORTI TERBANG HELI PATROLI UDARA : 151 SORTI
TOTAL JAM TERBANG HELI PATROLI UDARA : 518:33:00

Elements of the Business World

The Indonesian Forest Entrepreneurs Association (API) and the Association of Oil Palm Entrepreneurs (GAPKI) have an important role in forest and land fire management, especially in South Sumatra, because they represent two main industrial sectors that are often involved in large-scale land use, namely oil palm plantations and forests.

The Role of GAPKI in Forest and Land Fire Management

GAPKI as an association of the palm oil industry is responsible for ensuring that its members comply with government regulations related to land clearing, land management, and fire prevention. Based on the results of the interview, some of the important roles of GAPKI in forest and land fire management include:

1. Environmental Education and Awareness: GAPKI plays a role in educating its members on best practices in sustainable land management and free-from-burning methods.
2. Supervision: GAPKI seeks to ensure that its members follow safe and law-abiding operating standards, and encourages companies to actively participate in forest and land fire prevention efforts.
3. Cooperation with the Government: GAPKI supports government programs in terms of extinguishing and preventing forest and land fires, and is involved in the preparation of regulations related to environmental protection.

The Role of APHI in Forest and Land Fire Management

APHI represents the forestry industry and has a major role in preserving forests while reducing fire risk. The role of APHI in forest and land fire management includes:

1. Sustainable Forest Management: APHI is responsible for encouraging its members to apply the principles of sustainable forest management, including fire risk management.
2. Participation in Patrolling and Early Detection: APHI is involved in forest patrol efforts as well as the use of technology for the early detection of fires. They are working closely with governments and other agencies to detect and extinguish fires before they become larger.
3. Stakeholder Cooperation: APHI works with various stakeholders including governments, local communities, and international agencies in forest fire mitigation and mitigation efforts.

Although GAPKI and APHI have formal roles in forest and land fire management, both often face criticism regarding their effectiveness. Some of the key challenges include:

1. Non-compliance of Members: Not all companies that are members of GAPKI and APHI comply with the rules related to no-burn land clearing or have adequate fire

suppression systems. Not all plantation companies in South Sumatra are members of the GAPKI organization. Of the 287 companies in South Sumatra (rubber, palm oil, and sugarcane), only 78 companies are members of GAPKI. This means that only 27% of companies are new members of GAPKI.

2. Conflict of Interest: There is an assumption that some association members are more concerned with economic benefits than environmental conservation, so the commitment to forest and land fire management can be weak.
3. Weak Law Enforcement: There is often inconsistent enforcement of laws against companies that violate environmental rules, which reduces the effectiveness of the association's role in keeping its members accountable.

Overall, GAPKI and APHI play an important role in reducing and managing forest and land fires through policies, education, and cooperation with the government. However, to increase effectiveness, there needs to be a stronger commitment from members and stricter law enforcement against violations.

Community Elements

1. Farmers in Muara Baten Village, Jejawi District, OKI Regency

Farmers in Muara Badung Village, like many other farmers in the OKI (Ogan Komering Ilir) area, play an important role in local agriculture, whether in terms of rice, rubber, or oil palm. The condition of soil and waters in the OIC is often challenging, so farmers are faced with various obstacles such as land fire risk, water access, and sustainable natural resource management.

One of the main challenges for farmers in this area is the threat of forest and land fires which are often triggered by improper land clearing methods and climate change. Farmers admit that they often burn the remains of crops or clear the land for agriculture because this is still considered easy and cheap. There is no other alternative not to burn related to the cost factor, but in general, they are ready to help extinguish forest and land fires, this is seen from the availability of water pumps to water plants used to extinguish fires. In addition, they also help village officials in terms of informing them of forest and land fires.

2. Head of Deling Village, Pangkalan Lampam District, OKI Regency

Deling Village is one of the areas prone to forest and land fires because it has land with peat characteristics. Social and environmental issues that occur in the area, such as the handling of forest and land fires, natural resource management, and the implementation of government programs. Village heads are often involved in facilitating cooperation between communities, governments, and organizations in maintaining village sustainability. The facts on the ground are that the Head of Deling Village is actively involved in handling forest and land fires, such as the existence of community groups handling forest and land fires, and often urges residents not to carry out activities that trigger forest and land fires. It's just that the problem in Deling Village is that there is no adequate fire pump. This is a challenge for village heads to overcome

forest and land fires. For this reason, it encourages the use of village funds to allocate fire extinguishers such as water pumps to prevent the spread of fire.

3. Rawang Nusantara Organization

Organizations like Rawang Nusantara often face challenges in terms of funding, community participation, and bureaucratic obstacles or major economic interests. They also work to raise public awareness of the importance of protecting the environment while facilitating sustainable solutions. Rawang himself has conducted training for firefighters, and discussions on the impact of smog.

These three elements are interconnected in maintaining sustainability and welfare in OKI Regency. Farmers depend on the land they manage, village heads are tasked with ensuring that village management runs well, and organizations such as Rawang Nusantara support advocacy and empowerment activities for environmental protection.

Elements of Academics

Academics can research to understand the causes of forest and land fires, their impact on the environment, as well as effective prevention and control methods. Technological innovations, such as fire early detection tools, ecosystem-based extinguishing techniques, or the development of environmentally friendly fuels, can be born from academic research. Academics have a role in increasing public awareness about the dangers of forest and land fires, sustainable agricultural practices, and the importance of preserving forests. Unsri often organizes educational programs, seminars, or campaigns involving local communities, students, and other elements. Universities can play a role as consultants in formulating policies related to the prevention and management of forest and land fires. They provide scientific data-driven input to governments and related organizations to design more effective and sustainable regulations.

Academics are often a bridge between the government, society, non-governmental organizations (*NGOs*), and the private sector. With this collaboration, academics can help align the interests of various parties to deal with forest and land fires more comprehensively and sustainably. But despite all this, even though academics produce data-driven research, the results of the research are not always translated directly into policy. There is a gap between academia and decision-makers, where academic recommendations may not be prioritized by governments or policymakers for political or economic reasons. Sometimes isolated from the reality and needs of the local community. When scientific solutions do not consider the culture, traditional practices, or socio-economic context of the community, they may not be well adopted by the communities involved.

Elements of Mass Media

Mass media is the main source of dissemination of information about forest and land fires to the public. The media in South Sumatra, both print, broadcast, and digital, play a role in providing updates related to the status of the fire, the affected locations, and preventive measures that must be taken by residents. Education about the causes of forest and land fires, their impact on health and the environment, as well as prevention

methods, is also delivered through various media platforms. The mass media in South Sumatra also plays a role in spreading early warnings about the potential for forest and land fires. With the cooperation between government agencies, such as BMKG, BPBD, and the TNI/Polri, the media conveys information on extreme weather, fire risk levels, and disaster status in various regions, so that the public and related parties can be more vigilant. For example, online news portals and social media from media organizations in South Sumatra often provide the latest information about fire spots detected by satellites, so that people can avoid dangerous areas.

The mass media has the power to shape public opinion about the importance of protecting the environment and preventing forest and land fires. Through opinion articles, investigative coverage, and social campaigns, the media can advocate for stricter policies in forest and land fire prevention, including law enforcement against companies or individuals involved in illegal forest and land burning. Local media such as local newspapers often carry articles and investigative reports exposing the companies responsible for forest fires. They also contain expert opinions on how to reduce the incidence of forest and land fires. Mass media in South Sumatra helps encourage transparency and accountability, both from the government and plantation companies operating in areas prone to forest and land fires. The media often reports on local government actions, and law enforcement against land burning perpetrators, and highlights the failure or success of forest and land fire management programs carried out by various parties.

Overall, the mass media in South Sumatra plays a strategic role in building awareness, providing up-to-date information, and encouraging concrete actions to combat forest and land fires. By strengthening the synergy between the media, the government, and the community, the problem of forest and land fires can be handled more effectively. The mass media often highlights the dramatic or negative impacts of forest and land fires, such as forest destruction or health impacts, without discussing in depth the countermeasures or prevention solutions that are or can be implemented by the government. Focusing on these sensations can distract the public from the constructive efforts needed to address the problem. For example, news about casualties, environmental damage, and poor air quality often dominates more than coverage of efforts made by officers on the ground or early detection or local initiatives in preventing forest and land fires.

The mass media has more often focused on reporting when fires occur, such as the number of fires that occurred or the damage they caused, but paid less attention to preventive measures that can be taken by the community and the government. News that is too reactive without prevention reduces the positive impact of the media in suppressing the occurrence of forest and land fires in the future. For example, media coverage could be more on major ongoing fires, but little or no attention is paid to fire prevention campaigns or public education about sustainable practices. These weaknesses show that the mass media, although it has an important role in forest and land fire management, also needs to improve its approach to be more effective in providing accurate, balanced, and solution-focused information. Closer collaboration

with local communities, governments, and related organizations, as well as increased journalistic accountability, can help remedy these weaknesses.

Conclusion

Based on the analysis and discussion of the data that has been collected, it can be seen that the indicators of forest and land fire management strategies through the penta helix model, namely the goal of forest and land fire management, are quite successful in terms of prevention and there are still many forest and land fire incidents, the environment is quite good, the direction is good, the action is not optimal and the learning is not optimal. From the penta helix side, the government element in forest and land fire management has not been well committed, the role of the business world has not been optimal, community participation in forest and land fire prevention has not been optimal, the role of mass media has not been optimal, and the results of academic studies have not been optimally used as they should. Therefore, it can be concluded that the Forest and Land Fire Management Strategy in South Sumatra through the Penta Helix Model has not been successful. The factors that affect it are related to the lack of maximum role of the government in tackling forest and land fires, forest and land fires continue to recur which are closely related to the dry season factor and even increase when there is an El Nino phenomenon and low community participation in preventing forest and land fires.

The factors that cause forest and land fire management in South Sumatra Province are the habit of people who still clear land by burning, the extent of peatland in South Sumatra which is not proportional to the number of officers in the field, weather conditions, and the El Niño phenomenon cause a high level of drought and increase the risk of fire. In the dry season, flammable peatlands become very dry and difficult to extinguish. In addition, there is a lack of law enforcement for arsonists, a lack of public awareness, conflicts of interest such as the economy, and a lack of supporting infrastructure. In general, the implementation of the Penta Helix model in South Sumatra has given positive results but has not eliminated the threat of forest and land fires, especially during the peak conditions of the dry season and the El Nino phenomenon. The efforts to control forest and land fires in South Sumatra Province are seen from the perspective of the penta helix, namely the Government has a central role in making regulations, and policies, and supervising efforts to prevent and overcome forest and land fires, academics have a role in research, technology development, and innovation to overcome forest and land fire problems, companies, especially those engaged in the plantation and forestry sectors, has a great responsibility in land management, while local communities, especially farmers, are often involved in the practice of land burning as a fast and cheap method to clear land, so the role of the community in efforts to prevent forest and land fires is very crucial and finally the media plays a role in informing the wider community about the condition of forest and land fires, including putting pressure on the responsible parties and most importantly educating the public.

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