Disaster Prevention Management Governance Model
Forest and Land Fires Based on Ecotourism in Riau

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Abstract − **Riau Province is one of the regions in Indonesia that frequently experiences forest and land fires, which cause economic losses, environmental damage and threats to public health. This research aims to build a model for preventing forest and land fire disasters through an ecotourism approach, with a focus on integrating conservation efforts and empowering local communities. The research method used is a qualitative approach with case studies in several ecotourism areas in Riau. Data was collected through in-depth interviews with stakeholders, field observations, and analysis of related documents. The research results show that ecotourism has significant potential in preventing forest and land fires, especially through increasing environmental awareness among local communities and visitors, as well as developing environmentally friendly land management practices. The proposed prevention model includes several key elements: (1) active community participation in managing ecotourism areas; (2) sustainable environmental training and education; (3) collaboration between government, private sector and society in monitoring and enforcing the law; and (4) development of ecotourism infrastructure that supports nature conservation. Implementation of this model is expected to significantly reduce the risk of forest and land fires in Riau, while encouraging economic growth through sustainable ecotourism.**

Key words **– Policy, Ecotourism, Land fire, Riau**

I.   PRELIMINARY

Indonesia is often referred to as the lungs of the world because it has a very large forest area. Forests are considered to have a central role as producers of oxygen for humanity[1]. Unfortunately, the forest fires that hit Indonesia have made the forest area in Indonesia increasingly narrow[2]. The country even experienced material losses reaching 200 trillion rupiah. This is a fantastic amount compared to the losses in any case[3]. Forest fire disasters have been considered by people in various regions as an annual agenda. This fire disaster often occurs during the long dry season in various regions such as Sumatra and Kalimantan[4]. Unfortunately, the forest fires that hit parts of Indonesia were the deliberate work of several individuals, resulting in the impact of deforested forests. The forest burning was deliberately carried out with the aim of expanding plantation areas, such as oil palm and rubber plantations[5]. The aim is none other than so that the company that oversees the management of the plantation obtains greater profits. In 2015, the Environmental Campaign Division (Walhi) noted that Indonesia had experienced a loss of 2.6 hectares of forest area. Apart from that, the number of victims exposed to smoke reached 40 million people and 500 thousand of them suffered from Acute Respiratory Infections (ARI). Apart from causing huge losses in Indonesia, the impact of this haze also reached neighboring countries such as Malaysia, Singapore and Thailand. The government has made various efforts to overcome this haze. Unfortunately, these countermeasures are still considered inadequate by the community[6].

The phenomenon of forest and land fires in Riau is a serious problem that occurs almost every year, especially during the dry season. Forest and land fires in Riau are caused by a combination of natural factors and human activities. One of the main factors is the practice of clearing land through burning, especially in oil palm plantations and industrial forests. Peatlands drained for agriculture also exacerbate this condition, because dry peat is highly flammable and fires can spread quickly and be difficult to extinguish[7].

Figure 1.
Data from the Riau Province Central statistics agency on forest and land fires

Regency/City	Forest & Land Fire		
	Hotspot	Area Burnt	Number of Events
Pekanbaru	0	12.7	6
Dumai	395	122.75	25
Kepulauan Meranti	515	236.11	19
Kampar	548	83.25	35
Siak	682	76.5	9
Indragiri Hilir	1378	82	5
Bengkalis	1826	64	11
Rokan Hulu	1869	68	10
Indragiri Hulu	1919	45.3	8
Kuantan Singingi	2170	24.5	3
Rokan Hilir	3198	392	16
Pelalawan	3296	162.16	41

Source: [8]

In addition, fires in peatlands not only occur on the surface but can also spread underground, making them more difficult to contain and can last for weeks. The forest and land fires in Riau produced thick smoke which not only damaged the local environment but also spread to neighboring countries such as Malaysia and Singapore. This phenomenon, known as transboundary haze pollution, causes a decline in air quality in these countries, with significant impacts on various aspects[9].

Figure 2.
Satelite detected fire hot spot Indonesia's Riau Province
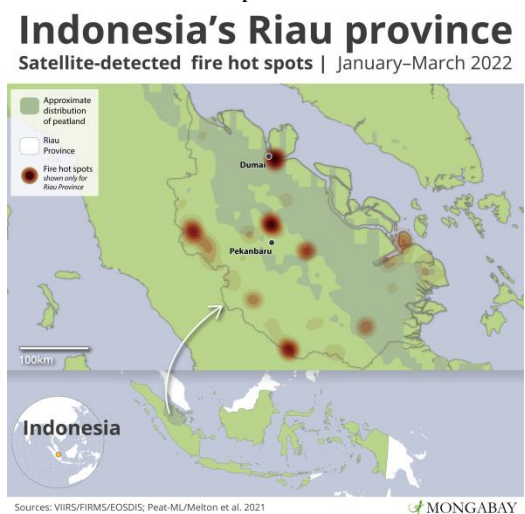
Source: VIIRS/FIRMS/EOSDIS;Peat-ML/Melton et.al, 2021

From a health perspective, this smoke causes an increase in respiratory diseases, eye irritation, and worsens asthma conditions in the population. During severe haze, daily activities such as school and work are often disrupted, with many public facilities forced to close[10]. From an economic perspective, the haze disrupts various sectors. Flights and transportation experienced delays or cancellations, tourism experienced a sharp decline as tourists were reluctant to visit affected areas, and the construction sector was hampered by air conditions that were unsafe for work. This causes significant economic losses for both Indonesia and neighboring countries. Apart from the direct impact, forest and land fires in Riau have also caused diplomatic tensions between Indonesia and neighboring countries. Malaysia and Singapore often protest to Indonesia, asking that firmer action be taken to prevent a recurrence of the haze. This situation has encouraged regional cooperation efforts through ASEAN, although the challenges to effectively address this issue remain large[11]. Overall, forest and land fires in Riau are not only a local environmental problem but also a regional problem that affects health, the economy and diplomatic relations with neighboring countries.Ecotourism is a form of tourism where nature is the main goal of recreation. Another definition states that ecotourism means a model of natural tourism in unspoiled areas with the aim of enjoying its natural beauty and supporting conservation efforts and increasing the economic income of local

communities. Some ecotourism activities can be carried out by visiting a village that has natural and cultural charm that is still preserved. According to the Ministry of Culture and Tourism of the Republic of Indonesia (2009), ecotourism has many objectives, all of which refer to aspects of education, empowerment, conservation and the economy of local communities, including: Providing experience and education to tourists Minimizing negative impacts that can damage environmental and cultural characteristics in the areas visited. Involving the community in its management and implementation. Providing economic benefits for local communities and tourism organizers. Making the tourist attraction sustainable and sustainable.

II.   RELATED RESEARCH

In terms of terminology, the meaning of public policy has many meanings. It all depends on the angle one interprets it from. Basically, government policy in organizing people's lives in many aspects of life is a policy that is oriented towards the interests of the community itself [12]. Every public policy will begin with the formulation of the problem. The formulation of these problems occurs in society. The term or definition of public policy will be aimed at overcoming problems, if they occur in society.

In fact, the term or definition of public policy has often been used. Public policy is a policy made by the government or authorized bodies to influence people's lives at large. Research related to ecotourism includes first, Ecotourism Development Strategy in Supporting Lake Tahai Nature Conservation. The results of research on ecotourism development strategies can be an effective means of supporting the natural conservation of Lake Tahai by combining responsible tourism activities with environmental protection. Ecotourism helps promote awareness about the importance of preserving the lake and its surrounding ecosystem. The second research entitled Social Media in the Development of Ecotourism in the Disaster-Prone Coastal Tourism Area of Cilacap Regency with research results shows that social media is needed in the development of ecotourism in the area. Apart from being a means of tourism promotion, social media is also an effective means of supporting the implementation of risk reduction programs disaster in the area.

III.   RESEARCH METHODS

The research method used in this research involves a qualitative approach with a focus on case studies in several ecotourism areas in Riau. A qualitative approach was chosen because it allows for in-depth exploration of the dynamics that occur in the field, especially related to interactions between society, the environment and ecotourism practices in the context of preventing forest and land fires. Data was collected through various techniques, including in-depth interviews with relevant stakeholders, such as ecotourism area managers, local communities and government officials. This interview aims to obtain their perspectives and experiences related to area management, conservation efforts, and the challenges faced in preventing forest and land fires. Apart from interviews, field observations were carried out to directly observe the physical conditions of ecotourism areas, including infrastructure, management practices, and community interactions with the environment. These observations provide contextual data that is important for understanding how forest and land fire prevention theory and practice is applied in the field.

Figure 3.
Qualitative Research Methods

Source: [13]

Document analysis is also an integral part of this research method. The documents analyzed include government regulations, annual reports on ecotourism areas, and publications related to conservation and ecotourism in Riau. This analysis helps understand the legal and policy framework that underlies the management of ecotourism areas and efforts to prevent forest and land fires. After the data is collected, the next step is data analysis. Qualitative data obtained from interviews, observations and document analysis were analyzed thematically to identify patterns, themes and relationships between various elements that contribute to preventing forest and land fires through ecotourism. This analysis helps in building a conceptual model that integrates various aspects discovered during the research. This methodology is designed to provide a comprehensive understanding of how ecotourism can play a role in preventing forest and land fires in Riau, as well as to identify key factors that support or hinder these efforts.

IV.   RESULTS AND DISCUSSION

The proposed model for preventing forest and land fires through ecotourism is based on several key elements that support each other. One important element is the active participation of the community in managing ecotourism areas. Local people have deep knowledge of their environment and traditional ways of managing it. By actively involving them, the community will feel ownership and be more motivated to protect the area from forest and land fires. This involvement can include various activities such as forest patrols, facility maintenance, and sustainable management of natural resources

Figure 4.
Map of area distribution in the production forest of Riau province
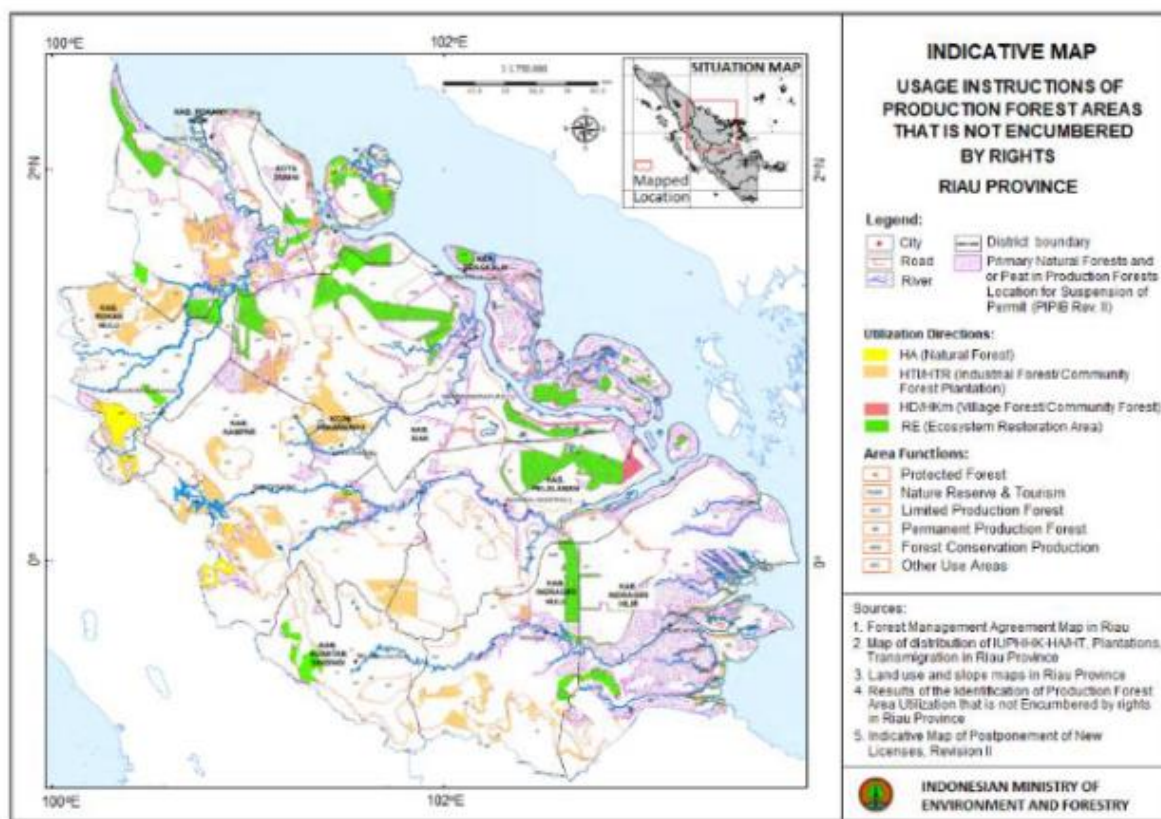
Source:[14]

Through continuous education, communities can understand the negative impacts of forest and land fires and learn best practices in land management. This education increases awareness of the importance of preserving nature and encourages proactive action in preventing risky activities such as careless burning of land. Collaboration between government, the private sector and society is also very important. Preventing forest and land fires requires close cooperation, with the government setting regulations and policies, the private sector providing resources and technology, and the community acting as monitors[15] and reporters of illegal activities that have the potential to cause fires. This collaboration ensures effective supervision and strict law enforcement, which systematically prevents forest and land fires.

Figure 5. Disaster Management Cycle

Sumber: disaster-management.piarc.org

The pre-disaster stage is carried out when there is no disaster and is under threat of a potential disaster[16]. Disaster Management Warnings Disaster management warnings have been carried out by BPBD in dealing with forest and land fire disasters through socialization that has not been thoroughly conveyed to the community and warning efforts such as installing banners prohibiting burning of forests and land to the community, but the response from the community has been indifferent. one of the factors causing warnings for forest and land fire disasters is currently not optimal. Disaster risk reduction (Disaster Mitigation) BPBD has attempted to reduce the risk of forest and land fire disasters through activities carried out such as education, outreach and putting up banners regarding the prohibition of burning forests and land, but the activities carried out cannot be said to be optimal because they have not delivered in its entirety to the community due to a minimal or small budget[17]. Preparedness is carried out by BPBD by establishing disaster emergency preparedness, creating command posts and making well points, but until now the construction of well points is still not running optimally, because the construction of water point wells is only available in a few villages due to shortages and limited budget funds which causes The construction of water point wells has not been comprehensive in other villages.

The emergency response stage is implemented and carried out when a disaster occurs. Emergency Preparedness There have been efforts made by BPBD in disaster emergency preparedness, BPBD has prepared infrastructure and volunteers to immediately go to the field if a forest and land fire disaster occurs and is quite optimal. Communication and coordination is always carried out between related parties, namely TNI, POLRI, Manggala Agni, BPK and MPA, which runs well based on the results of documentation. BPBD always involves TNI, POLRI and BPK in activities to handle forest and land fire disasters[18]. Rescue and Evaluation The efforts made by BPBD in rescue and evacuation are quite good and really responded to the forest and land fire disaster that occurred, but there are several factors that cause BPBD to be overwhelmed and unable to extinguish it because there are no water points and road access to the location is difficult. within reach. Post-Disaster Stage, which is the time after a disaster occurs. Emergency Assistance. Until now, emergency assistance for forest and land fire disasters does not exist and has never been carried out. There are several problems with why assistance for forest and land fire disasters is not available because the land owner does not exist or is not available. There are people who admit that the land belongs to them and also for the forest and land fire disaster relief budget they never received a budget and the budget for forest and land fire disaster management is very small. Damage Evaluation BPBD collects data on damage caused by fire disasters and collects data on the owners of the land that was burned whether the land was intentionally burned or because of natural factors, but until now BPBD does not know for sure whether the forest and land fires that occurred were caused by natural factors or non-natural factors. natural. Recovery Recovery from forest and land fire disasters has not yet been carried out, because the burned land is suspected to have been deliberately burned to clear land for gardening. Recontroduction after forest and land fire disasters has never been carried out by the BPBD and other parties, but the police have planted tree seedlings only to reduce environmental damage, not to restore damage caused by forest and land fire disasters. Inhibiting and Supporting Factors Inhibiting Factors: (1) Human resources do not utilize teams and volunteers; (2) Limited budget; (3) Difficult access to locations and water points; (4) Insufficiently comprehensive outreach to the community Supporting Factors: 1) Many volunteers assist in handling forest and land fire disasters; (2) Involvement between parties.Finally, developing ecotourism infrastructure that supports nature conservation is an important pillar[19]. Well-designed infrastructure not only supports tourist activities but also plays a role in

environmental conservation. For example, carefully laid out tourist trails can reduce environmental impacts, and environmentally friendly facilities such as rubbish bins and waste treatment systems can prevent pollution. In addition, this infrastructure can be equipped with elements for fire prevention, such as monitoring towers or fire extinguishers, thereby supporting overall environmental preservation.

V. CONCLUSION

The integration of ecotourism in efforts to prevent forest and land fires has significant potential, especially through active community participation, sustainable environmental education, and collaboration between government, the private sector and society. Community participation in managing ecotourism areas not only strengthens their sense of ownership and responsibility for the environment but also increases the effectiveness of preventing forest and land fires by utilizing local knowledge. Sustainable environmental education plays an important role in forming awareness and behavior that supports nature conservation and preventing forest fires. Through training and education, the public and visitors to ecotourism areas can understand the importance of preserving nature and avoiding practices that risk triggering fires. Close collaboration between government, the private sector and communities has also proven crucial in ensuring effective oversight and consistent law enforcement. This collaboration allows for more optimal use of resources and technology and creates better monitoring mechanisms in the field. The development of ecotourism infrastructure that supports nature conservation is also identified as an important element in the forest and land fire prevention model. Infrastructure designed with environmental aspects in mind not only enhances the tourist experience but also helps prevent fires through the implementation of environmentally friendly management practices.

THANK-YOU NOTE

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