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Prevention of Land and Forest Destruction to Create Sustainable Forest in Pelalawan District, Riau Province, Indonesia

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Abstract:

The aims of this research to identify and analyze the impact of the ecological, economic, and social caused by land and forest fires. This research was conducted in Pelalawan Regency, Riau Province, January-June 2017. This study uses qualitative and quantitative descriptive methods (Mix Method). Data and information collected in this study include qualitative and quantitative data, and the simulation is the community in Pelalawan District, Riau Province. Sampling clicking probability uses sampling, by simple random sampling with Slovin formula. Data analysis uses Partial Correlation. Further analysis of a using an eyebrow is an environmental factor in the form of social, economic and ecological. The study found that the p ola fire prevention and forest land with three patterns, namely empowerment patterns, patterns of oversight and enforcement patterns. These three patterns can be used by the Indonesian government for management and anticipate the land and forest fires in the future.

Keywords: Land and forest fire prevention, monitoring patterns, enforcement patterns, and prevention patterns, peatlands

1. Introduction

Based on the Spatial Plan of Pelalawan Regency, Riau Province in 2012-2015, There are limited production units covering 297,018.16 hectares, permanent production forests covering an area of 424,456.69 hectares, mangrove forests covering an area of 444,780.06 hectares, forest reserves of 33,976.47 hectares, and protected forests covering an area of 755,856.10 hectares. While the content of the medium and long-term Riau Province is the realization of forestry operations to ensure the sustainability and improvement of people's prosperity. To realize this, forests must be protected from damage caused by human actions, livestock, land and forest fires, pests and other diseases. In 2014 there were severe forest and land fires (259 hectares) in Riau Province. The most hotspots due to land and forest fires were observed in Pelalawan District with the number of hotspots as many as 115 points.

The most prominent impacts of forest and land fires, according to Rasyid, F. (2014) are the occurrence of haze that has disrupted human health, and land, sea, and air transportation systems. Whereas Tacconi, L. (2003) states that the impact of forest fires on agricultural production is allegedly not too large because combustion is carried out for land preparation unless fires reach agricultural lands that produce. Forest fires produce carbon emissions released into the atmosphere, estimating forest fires in 1997 has released carbon emissions of 0.81-2.57 Gt, most of which (60%) come from peatlands (Silva Lestari, 2015).

There are many ways that the government has done to overcome forest and land fires such as making canal blocks, making water dams (embung), providing information to the community, and companies about forest and land fires, also provides a deterrent effect or sanctions on forest burners (Latifah, RN, and Pamungkas, A., 2013). However all did not yet provide optimal results, so it needs to be examined again for men cannot your efforts to minimize the level of land and forest fires in Indonesia. For this reason, the problem that needs to be looked for in this research is (1) What are the ecological, economic and social impacts of land and forest fires? (2) How do you influence the pattern of community

empowerment, supervision, and enforcement to create sustainable forests? and (3) how are the patterns of prevention of sustainable land and forest fires?

2. Research Methods

The study was conducted in several places in Pelalawan Regency, Riau Province. The selection of research locations is based on areas where there are many cases of fire and are affected, easily accessible from the capital city of Riau Province and already have non-governmental organizations concerned with fire. Research time for \pm 6 months. The research method used is qualitative and quantitative descriptive method (Mix Method). Data and information collected in this study include qualitative and quantitative data. The population in this study were people in Pelalawan Regency, Riau Province. The sampling technique used is probability sampling with the form of simple random sampling. To determine the number of samples using the Slovin formula. The data analysis technique used is a partial correlation. Further analysis is to analyze environmental factors in the form of socio-cultural, economic and ecological.

3. Results and Discussion

3.1. Peatland Ecology Towards Sustainable Patterns of Land Fire and Sustainable Forest Management

Increased threats to the sustainability of peatlands due to fire and conversion in an effort to develop plantation areas, it has made a serious threat to the conservation of biodiversity in the forest. The efforts of the government and non-governmental organizations (Wetland International) have been carried out in the form of a campaign on the importance of efforts to save biodiversity in peat forests from fire events. In addition, the consequences are in his right arises including smoke and heat, so that many species, flora, and fauna are burned. Occurring diseases in humans, such as Acute Respiratory Infection (ARI). The social effect for society in the form of district Pelalawan Her limited social activity outside the home, the shorter the viewing distance (<5 meters), teaching and learning activities in schools (primary and secondary) are disturbed, land transport, air, and sea also disturbed. Other impacts include loss of community livelihoods, decreased the sense of security and harmony of local communities (Office of the Minister of State LH, 1998). FWI. (2009), another more worrying result is the toxicity of dioxin from forest fires, which can cause cancer and infertility for women (Lester, S., 2000). Based on its economic use values that the efficiency of the company and the communities in forest management that is when open new land in land conversion into plantations such as oil palm plantation area. This activity is carried out in use to reduce costs and time needed in large numbers so that economically it will be very profitable.

To see pattern community empowerment in me realize forest conservation and sustainable then used statistical analysis (partial correlation), and use other variables to determine which variables pe m helplessness of society, which is a determinant variable in shaping the prevention of fires and sustainable forest. Correlation test results obtained 0.76. This shows that this correlation is a very strong relationship, between patterns of empowerment and increased enforcement patterns. I ni indicate the pattern of increasing scrutiny by governments, communities, and companies. Until prevent forest fires that occur will most probably be overcome. To state that this empowerment pattern and enforcement pattern is a strong and mutually influential correlation, it is necessary to involve other variables as controls, namely supervision pattern variables.

Based on the analysis carried out on the pattern of community empowerment to create sustainable lands and forests, there are several efforts that need to be made towards empowering these communities. As carried out by the government of Pelalawan Regency and companies that have encouraged community participation as one of the deceptive efforts in overcoming land and forest fires, namely through the formation of fire-caring community groups. In addition, cooperation between the government and the company has also been developed. This program is better known as Joint Forest Management (JFM), which is a forest treatment system with the community and the government (Misra D, Shasli K, 2005). Another urgency for the participation of the community or community empowerment because of their presence which is spread widely in adjacent areas is prone to land and forest fires. With this approach, as early as possible can in detection something specific time, and effort was also early burnout can be done in any event land and forest fires, which can prevent the occurrence of fire wider (Purbowaseso, 2004).

But on the other hand, in empowering the community to prevent land and forest fires in Pelalawan District, because this area there is a lot of community-owned agricultural land and plantations, and also plantation-owned land. From field observations, it is known that most of these areas are peat lands and only a small amount of land is not peat or mineral, so if there is a forest fire, the land will be flammable and quickly spread everywhere (Limin, Suwiti H. 2006). The government should jointly with the company empower the community to be aware of the arrival of the dry season. So it is necessary to form a fire-care community group, which is assisted by non-governmental organizations (NGOs) who work as farmers to prevent land and forest fires. Thus, it is expected that there will be no land and forest fires in the area later (Ministry of Forestry, 2012). The components of the community empowerment pattern are shown in the chart of empowerment patterns in Figure 2.

3.2. Supervision Patterns for Creating Sustainable and Sustainable Wealth

Supervision pattern in creates Forest sustainable that sustainable, in form pattern prevention Fire land and forest sustainably, from h a cyl correlation obtained - 0.620. Correlation this very strong, if value creation Partial pattern supervision decrease then pattern enforcement must be improved. Your t negative from this correlation shows increasingly high pattern supervision then it will be followed by coming down enforcement. this indicates it is business in prevention Fire Forest will very maybe to be able to overcome. From this correlation test concluded that pattern

supervision and pattern enforcement this is a strong correlation and mutual influence. Participation and participation of the community in supervision forest and land this could in the form of report or complaint about their offenses committed by someone or a certain group.

3.3. Enforcement Patterns for Creating Sustainable and Sustainable Forests

Enforcement patterns in creating sustainable and sustainable forests in shaping patterns of prevention of sustainable land and forest fires, based on the results of correlation tests obtained a value of 0.674. This shows that this correlation is very strong if the partial correlation value of empowerment patterns increases then the pattern of supervision must be increased as well. because of that correlation, this explains increasingly high pattern empowerment and supervision then it will be followed with come down pattern enforcement. this indicates it is a business-government in prevention Fire Forest without must give harsh repression to owner and manager land.

3.4. The Pattern of Prevention of Land and Forest Fire to Create Sustainable and Sustainable Forests

Based on the results of the three partial correlation patterns, a pattern of prevention of sustainable land and forest fires can be found.

3.5. Empowerment Pattern Analysis to Prevent Land and Forest Fire in Pelalawan District

Empowerment patterns in Pelalawan district have several steps that must be taken, including (a) Development of community aspirations and participation, (b) community institution development, (c) development of people's economic enterprises, (d) cross-sectoral approaches, applying environmentally friendly technology, (e) forest protection and nature conservation (firm, 2013). According to Wihandoko (2015), which is involved in the processes that are a) the role of government or government bureaucracy, b) civic organizations outside the community itself, c) public institutions, d) cooperative and e) accompanying kraft of community empowerment born as an antithesis to the model of development and the model of industrialization which is less favorable to the majority population . The concept is built on a framework of thinking logic s as follows:

- That centering process power is built from the concentration of mastery of the factors of production;
- Concentration power factor production will give birth to workers' communities and people who are peripheral entrepreneurs;
- Power will build knowledge systems, political systems, legal systems, and ideologies that are manipulative to strengthen and legitimize; and
- Concept system knowledge, the legal system, political system, and ideology, will systematically create two groups of people, namely empowered people and civilized communities (erni febrina, 2012).

People who live and live in areas close to forests and land have a very large role in firefighting and fire prevention. They are the ones who determine and see the first fire and if it is acted quickly it will certainly expand and spread. The information from the surrounding community is very useful and needed by the local and central government, to find out what causes and areas are prone to such fires. Community empowerment activities are the first activities carried out. This is the main strategy so that environmental improvements are understood and supported by the community. Three components in improving the environment to prevent the occurrence of fire and reduce greenhouse gas emissions, namely: water management, ameliorant administration of chicken manure, and pineapple planting in rubber plants (Anang Firmansyah et al., 2014).

3.6. Analysis of Monitoring Patterns to Prevent Land and Forest Fires in Pelalawan District

Analyze surveillance patterns to prevent land and forest fires to analyze them according to; Dea Mega Fuji Lestari (2013), the supervision in question is:

- For knowing the way work that keeps an eye on not happen Fire land and forests previously often happened.
- For a fix, it mistakes made by individuals who often burn land and forests.
- For knowing is the use of the budget (budget) that has been set in the planning on target and in accordance with what has been planned.
- For knowing results work compared with the previous one when setting in planning.

According to Susan Page, et al (2016), the implementation of supervision aims to ensure the timeliness of the execution of work in accordance with the plan carried out to achieve policies and orders, curb the direction of work activities, prevent waste and fraud in doing work, ensure the realization of community satisfaction, Stake Holder, other regions and neighboring countries for no land and forest fires in Pelalawan District. There are two supervision techniques, namely:

- Supervision directly, that is Organizational leaders conduct their own supervision of the activities being carried out. This direct supervision can take the form of direct inspections, on the spot observation, and on the spot reports.
- Supervision no directly that is, surveillance from a distance, this supervision is carried out through reports submitted by the people. Report this could be written and oral through telephone (Ardansyah and Wasilawati, 2014).

In order to achieve optimal supervision in accordance with the operational standard of work (SOP), there needs to be involvement of all stakeholders to work in carrying out supervision to prevent land and forest fires in Pelalawan District. For it is meant here is that the stakeholders; TNI, POLRI, BPBD Kab. Pelalawan, BKSDA Kab. Pelalawan, Forestry

and Environment Agency Kab. Pelalawan, Regency Tourism Office Pelalawan, a company in Kab. Pelalawan, Manggala Agni, NGOs, Community Care for Fire, Districts, Villages, Villages in Kab. Pelalawan, Indonesian Forum for the Environment (WALHI), District Fire Department Pelalawan. And assisted by the Riau Provincial Environment and Forestry Service, Riau Province BPBD, BMKG Riau Province, BPPT, Riau Province BKSDA and the Indonesian Forum for the Environment (WALHI) Riau Province.

3.7. Analysis of Enforcement Patterns in the Context of the Prevention of Land and Forest Fires in Pelalawan District

According to Sylviani, and Hakim, I. (2014), action or Enforcement of environmental law can be interpreted as the use or application of instruments and sanctions in the field of administrative law, criminal law and civil law with the aim of forcing the subject of law to comply environmental legislation. The use of administrative law instruments and sanctions is carried out by government agencies and also by citizens or civil legal entities. For the use of criminal law sanctions, it can only be done by government agencies. Meanwhile, the use of civil law instruments, is a civil suit, can be carried out by citizens, civil legal entities and government agencies (Wahyu Prawesthi, 2016). Law enforcement is carried out by law enforcement in the following order:

- Reprimand WARNING so that stop violation and don't do again (trial).
- Loading obligation certain (compensation, fine).
- Allowance and exclusion (revocation of certain rights).
- Imposition body sanctions (imprisonment, capital punishment).

Enforcement of the environmental law is closely related to the ability of the apparatus and the compliance of citizens towards the prevailing regulations, which cover three legal fields, namely administration, criminal and civil. Thus, environmental law enforcement is an effort to achieve adherence to regulations and requirements in legal provisions that apply generally and individually through supervision and application (or threat) means of enforcement of administrative, criminal, and civil law (Aziz Kurnia, 2016). The following are some means of environmental law enforcement: First, the means of Administrative Law Enforcement. Second, the enforcement of Civil Law.

7. Court Route

Dispute resolution through court channels is regulated in Article 87 to Article 92 of UUPPLH-2009, namely to demand compensation and restoration of the environment. There are several principles that must be considered by the panel of judges in examining the settlement of environmental disputes through the courts as formulated in Article 87 UUPPLH as follows:

- Every guarantor answer businesses and/or activities that commit acts that violate the law in the form of environmental pollution and/or damage that cause harm to others or environment life mandatory pay replace loss and/or do action certainly.
- Anyone committing the alienation, changing the nature and form of business, and/or activity of a business entity those who violate the law do not give up the legal responsibilities and/or obligations of the business entity.
- The court could set payment of forced money for each day of delay in the execution of a court decision.
- The amount of money forced decided based on regulation legislation (Kurnia , 2016).

7.1. Path outside the Court

In Law No. 32 of 2009 concerning Environmental Protection and Management the settlement of environmental disputes outside the court-regulated in Article 85 states:

- Settlement of environmental disputes living outside the court is carried out to reach agreement on a) form and amount of compensation, b) remedial actions due to pollution/destruction, c) certain actions to ensure that there will not be repeated pollution/destruction, and/or, and d) actions to prevent negative impacts on the environment.
- Non-court dispute settlement does not apply to environmental crimes as regulated in this Law.
- In the settlement of environmental disputes outside the court, the services of mediators and/or arbitrators can be used to help resolve environmental disputes.

7.2. Law Enforcement

Efforts made in dealing with post-forest fires are one of them is to enforce the law for anyone who intentionally or unintentionally fires. In Article 27 PP No. 45 of 2004 stated that, in the framework of handling post-forest fires as referred to in Article 20 paragraph (1) letter c, efforts will be carried out covering 1) identifies and evaluation, 2) rehabilitation, 3) law enforcement. In addition to providing sanctions and policies related to the handling of forest fires and land in peatlands, it should lead to a review of the permits that have been granted for the development of oil palm plantations. This strategy is important to ensure that the development of oil palm plantations should not result in deforestation, damage to peatlands and carbon emissions (Sri Nurhayati Q, 2014).

Law enforcement against burning forests, either on purpose or do not need to be subjected to legal sanctions of the most severe to the sanctions cumulatively, it is according to the provisions of Article 30 of Government Regulation No. 45 of 2004 states forest utilization license holder, the holder of the license to use the forest area or owner Forest rights are responsible for the occurrence of forest fires in its working area (the accountability paragraph referred to in paragraph (1)

includes 1) criminal responsibility, 2) civil liability, 3) payment for compensation; and/or, 4) administration distrust (paragraph (2)).

National and international NGOs, aid agencies and the media have used estimates of the 1997/98 forest fire cost estimates to emphasize increasing problems land and forest fires, the need for government action to prevent land and forest fires and the controller. The recommended policies vary widely and involve the forestry and agricultural sectors, including oil palm and HTI plantations, as well as smallholder plantations. This policy includes prohibiting or freezing forest conversion to improving land allocation policies and forest fire control procedures available, with the adoption of reducing the impact of logging activities, strengthening regulations and penalties for those who clear land in plantations by burning land and rationalizing land use involving community to develop land use consensus and establish community responsibility and commitment (Luca Tacconi, 2003).

8. Analysis of Land and Forest Fires in Riau Province

Based on the results of interviews with people in various regions of the Regency / City of Riau Province, it is known that the forms of activities carried out by the community in the field as a role in forest fire protection efforts, which include:

- Detection and reporting as soon as possible for land and forest fires.
- Patrol field/forest routine, where is the form patrol this there is two kind of, that is patrol get around Forest good with vehicle or walk combing forest, or with keep watch at the surveillance post forest.
- Counseling Fire Forest to society, officials involved that is officer part public relations who work together with part security.
- Blackout Fire forest together.

9. Impact of Forest Fire on Ecology, Social

Impact Land and forest fires have a direct impact on the environment such as :

9.1. Ecological Impact

- Lost a number species; Besides burning various flora, forest fires also threaten the survival of a number of animals. Various endemic species (plants or animals) threatened extinct effect Fire forest.
- Erosion; Forest with the plant functions as an erosion barrier. When a plant is destroyed due to a forest fire it will leave forest land that is susceptible to erosion by rainwater and even wind.
- Over function forest; Burned forest area takes a long time to return to forest. In fact, often the forest experiences a change of designation into a plantation or grassland.
- Decrease water quality; One of them function ecological the forest is in the hydrological cycle. The burning of forests has the effect of losing the ability of forests to absorb and store rainwater.
- Global Awareness; Fire forests produce smoke and CO₂ and other gases. In addition, the burning of the forest will reduce the ability of the forest to store carbon. Both have a major influence on climate change and global warming.
- Sedimentation river; Dust and residual combustion carried by erosion will settle in the river and cause silting.
- Increase disaster nature; Disruption of the ecological function of forests due to forest fires has increased the intensity of natural disasters (floods, landslides, and droughts).

9.2. Economic Impact

Land and forest fires on Pelalawan district will have an impact on the economy of the community and entrepreneurs, among others, the cancellation of the schedule of land-air and air transportation, the loss of plants, especially plants that have high economic value, very high medical costs, the decline in industrial production in Pelalawan Regency (PT RAPP) and offices, and the collapse tourism business, corporate losses due to decreased production, Opportunity costs due to decreased land use, damage to economic / development / agricultural assets due to flood inundation, disruption of community livelihood activities, especially farmers, traders, other activities that produce the daily needs of the community.

9.3. Social Impact

The result of indirect forest and land fires has an impact on the social life of the community at the regional and national levels, due to the smoke produced from burning which disrupts human life. Social impacts experienced include, among others, deteriorating health and decreasing human productivity, decreasing income in tourism, and flight delays, disruption of harmonization with neighboring countries. Besides that, it can also interfere with harmonization with neighboring countries (Malaysia, Singapore Thailand, and other neighboring countries. This is due to the smoke caused by land and forest fires in Riau Province especially and the island of Sumatra, in general, has passed the border and enter neighboring countries. As a result of smoke entering neighboring countries, a variety of social problems were also experienced ranging from declining levels of health, decreased productivity and disruption of transportation and tourism (Glover, 2004).

10. Conclusion

- Consequences of land and forest fires have an impact on ecological, economic and social aspects
- Empowerment pattern society, monitoring pattern, and the pattern enforcement land and forest fires have a strong correlation for use as part from pattern prevention Fire land and forest sustainable. These three patterns can be used by the government in handling land and forest fires by applying it in the field.

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