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A Model for Prevention of Forest and Land Fires Crimes Using a Sustainable Plantation Approach

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Abstract: This research gives a general idea of a model for preventing forest and Land Fires by accelerating sustainable plantation development. This study aims: to analyze the sustainable plantation conception in the law and to find its current weaknesses, to analyze the sustainable plantation certification principles and criteria and its relations with forest and Land Fires, and also to recommend a model for the prevention of forest and Land Fires through the acceleration of sustainable plantation development. This research employed a socio-legal research method, where the law is viewed as a norm and a fact. Research showed that sustainable plantation is a part of sustainable economic development as governed in the Indonesian Constitution. In the sustainable plantation conception, the plantation development should consider the economic, social-cultural, and ecological aspects. There are principles and criteria related to preventing forest and land fires in the sustainable plantation certification scheme. Both land opening and cultivation should be conducted with zero burnings. A model for the prevention of forest and Land Fires may be carried out through the acceleration of independent plantation coaching according to the principles and criteria of sustainable plantations through funding, facility, and training supports. Apart from that, the Social Forestry program needs to be accelerated to access the people around the forest to manage forests.

Keywords: environment, law, crime, forest and land fires, plantation.

使用可持续种植园方法预防森林和土地火灾犯罪的模型

摘要：这项研究给出了通过加速可持续种植园发展来预防森林和土地火灾的模型的总体思路。本研究的目的是：分析法律中可持续人工林的概念并找出其存在的不足，分析可持续人工林认证的原则和标准及其与森林和土地火灾的关系，并推荐一种预防森林和土地火灾的模型通过加速可持续种植园发展来应对土地火灾。本研究采用社会法律研究方法，将法律视为规范和事实。研究表明，可持续种植园是印度尼西亚宪法规定的可持续经济发展的一部分。在可持续种植园概念中，种植园开发应考虑经济、社会文化和生态方面。可持续种植园认证计划中有与防止森林和土地火灾相关的原则和标准。土地开垦和耕种都应做到零燃烧。根据可持续种植园的原则和标准，通过资金、设施和培训支持，可以通过加速独立种植园指导来实施预防森林和土地火灾的模式。除此之外，需要加快社会林业计划，让森林周围的人们管理森林。

关键词：环境、法律、犯罪、森林和土地火灾、种植园。

1. Introduction

The forest and land fires in Indonesia, which happened in 2015 was worsened with the long dry season and the influence of El Nino from June 21st to

October 20th; the fire burned more than 2.4 million hectares of land and destroyed plants [1]. Burning employs an important role in land preparation for plantation business actors due to some reasons as follows: it is easy to implement, it requires a low cost,

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the process is quick, and only simple tools are required. Due to the limited land and the increasing population, land rotation shifted to become shorter, namely only 2-3 years. It encourages unsustainable agricultural practices. [2]. Between the period 2001 to 2005, there were 26,623 hotspots in the Jambi province. The fire was also utilized by forest and palm oil companies for land preparation. During that period, 20.67% of the post-fire area was converted into plant forests, then 27.06% was converted into palm oil plantations; meanwhile, the rest (52.27%) are the smallholders' lands, people. These findings show that the society or the companies used the fire to open the land, even though there are some zero-fire methods to open land [3].

This problem recurred in 2019, with 1,649,258 hectares of forest and land on fires [4]. The forest and land fires are still related to the business activities of the companies and the people. That is proven by the fact that some companies and people were named suspects by the police force.

The data on law enforcement against forest and land fire crime from the General Directory of Environmental and Forest Law Enforcement states that from 2015 to 2020, there had been 10 cases with the complete investigation status (P-21), with 8 corporate perpetrators and 2 individual ones [4]. This fact violates Law No. 39 of 2014 on Plantations, which states that the development of plantations must be carried out sustainably by considering the economic, socio-cultural, and ecological aspects. Apart from that, the development of sustainable plantations must fulfill the principles and the criteria of sustainable plantation management. Sustainable management has a role in achieving the Sustainable Development Goals 2030 (SDGs 2030). Sustainable plantations may encourage the achievement of the SDGs, especially related to the objectives of widespread poverty eradication, supporting inclusive and sustainable economic developments, full and productive labor, and decent jobs for all.

One of the international – and Indonesian commodities with a sustainability certificate and sustainable management is palm oil. The Roundtable on Sustainable Palm Oil (RSPO) and the Indonesian Sustainable Palm Oil System (ISPO) are the main references for international and Indonesian stakeholders in the sustainable palm oil certification. Both the RSPO and the ISPO have principles and criteria related to protecting and preserving the ecosystem and the environment, which prohibits fire in clearing land. Indonesia and Malaysia are the largest palm oil producers, with 81% of the total area certified by RSPO [5].

Addition of 2-3 research hypotheses:

A more integrative and sustainable model for the prevention of forest and Land Fires may start from the commitment and responsibility of plantation and forest

companies in implementing the principles of sustainability and environmental friendliness according to the law. Companies must have systems, facilities, and infrastructure to control forest and land fires. The weak monitoring towards the companies' compliance also contributes towards the forest and Land Fires crimes due to negligence. The increase of independent planters' participation in the sustainable plantation certification may become a solution to control forest and land fires. This effort requires funding and institutional capacity development for independent planters from the government.

This research aims to find a model for preventing forest and Land Fires using the sustainable plantation development approach. Meanwhile, the objectives of this research are as follows:

1. To find a sustainable plantation concept in the current constitutional regulations.
2. To find the relations between sustainable plantation system principles and criteria and prevent forest and land fires.
3. To find a model for the prevention of forest and Land Fires using the sustainable plantation development approach.

2. Methods/Materials

This study uses the socio-legal research method, where the law is viewed as both a norm and a fact. As socio-legal research, this paper analyzes the constitutional regulations related to forest and land fires. This research analyzes the behavioral patterns of plantation companies, independent smallholders, and society regarding the practices of forest and Land Fires. The sociological analysis is used to formulate the options to prevent forest and land fires. According to Sulistyowati [6], there is a need for an interdisciplinary approach in the socio-legal study, where concepts and theories from various disciplines of study are combined to analyze a legal phenomenon related to the social, political, economic, and cultural contexts. The socio-legal study may help provide materials used to assess impacts that may happen due to policies in certain contexts [6].

3. Results

3.1. The Concept of Sustainable Plantation in the Law

Article 33 clause (4) of the Republic of Indonesia's 1945 Constitution states that the national economy is established based on economic democracy, including the principles of sustainability and environmental friendliness. Article 28H clause (1) regulated that every person has the right to live in a good and healthy environment. The Green Constitution is the constitutionalizing of environmental legal norms, where the government embraces the principles of sustainable development [7]. The constitutional

principles of sustainability and environmental friendliness must inspire all constitutional regulations and all policies in all sectors.

The sustainable development concept is defined in Law No. 32 of 2009 on the Protection and the Management of the Environment. It is a conscious and deliberate effort to harmonize the development strategies' environmental, social, and economic aspects. Then, Law No. 32 of 2009 on the Protection and the Management of the Environment also states that one of the main objectives of environmental protection and management is to achieve sustainable development. The natural resources are utilized harmoniously with the environmental functions.

To maintain sustainable development, one of the instruments used is the standard criteria of environmental destruction. It is the measurement of the limit of physical, chemical, and environmental changes which the environment may buffer for it to be still able to preserve its functions. Law No. 32 of 2009 on the Protection and the Management of the Environment prohibits individuals and business entities, both incorporated and unincorporated, from opening lands using fire. There is an exception for society. They are allowed to burn lands with a strong consideration of the local wisdom in their areas, within a limited area.

The sustainable and environmentally friendly plantation concept contributes to integratively resolving forest and land fire issues. This concept is part of the non-penal approach (outside of the criminal law) in law enforcement. That is in line with G. Peter Hoefnagels's theory on criminal policy, which states that crime prevention is not merely related to the implication of criminal law. Still, it comprises various efforts to prevent a crime. Applying a repressive and punitive criminal law or penalization is not the only method of preventing crime. Crime prevention must also consider other persuasive, corrective, and educative approaches.

The conception of sustainable development is also adopted in Law No. 41 of 1999 on Forestry, which states that the forestry establishment is aimed to create just and sustainable welfare for the society.

The government carries out the protection of the state forests; meanwhile, the protection of the private forests is carried out by their rightful owners. The holders of the forest usage license are obliged to protect the forests in their work areas.

Article No. 49 of Law No. 41 of 1999 on Forestry, which had been changed into Law No. 11 of 2020 on Job Creation, regulated that those who own the business licenses must carry out preventive efforts against forest fires in their work areas. The Law No. 41 of 1999 prohibits every person from burning forests. Initially, this law allowed the limited burning of forests at conditions that cannot be avoided, for example, to eradicate pests and diseases. But, the issuing of Law

No. 11 of 2020 on Job Creation eradicated this stipulation.

The sustainable development conception is also adopted in the regulations regarding plantations, as regulated in Article 62 of Law No. 39 of 2014 on Plantations. The plantations must be developed based on some principles: *First*, the sustainability principle implies that plantation management must be carried out sustainably by maintaining the environmental function's preservation and considering the socio-cultural functions. *Second*, the principle of environmental function preservation implies that it must use facilities, infrastructure, methods, and technologies that do not disturb the biological, mechanical, geological, and chemical aspects of the environmental functions.

To establish sustainable plantations, the independent smallholders and the plantation companies who cultivate plantations must prevent environmental destruction. Article 56 of Law No. 39 of 2014 on Plantations strictly prohibited every plantation business actor from clearing and managing land using fire. Then, every plantation business actor is obliged to have systems, facilities, and infrastructure to manage forest and land fires.

3.2. Principles and Criteria of Sustainable Plantations and its Relations with the Prevention of Forest and Land Fires

The plantation subsector contributes to the agricultural Gross Domestic Product (GDP) in Indonesia [8], especially oil palm. But it has at the same time contributed to fires and environmental destruction. With good value chain management, we may decrease forest and land fires [9]. The National Agency for Disaster Prevention has stated that 80% of the land destroyed by forest fires in Indonesia is converted into plantation lands. That shows that forest fires are related to unsustainable business practices [10].

In 2016, the United Nations Development Program (UNDP) facilitated a study with RSPO and ISPO, supported by the Ministry. Studying the similarities and differences between the RSPO and the ISPO is the first step to finding a good form of cooperation for both parties and facilitating the field audit and the certification process [11].

The seventh principle of the RSPO indicated that there must not be fire to control pests, except in extraordinary conditions, such as if there are no other effective methods and it must be carried out with the approval of the authorized institutions. Criterion 7.3 prohibits the use of open fire to eradicate waste. Then, criterion number 7.11 states that "Fire is not used for preparing the land and is prevented in the managed area".

In line with the RSPO's aim to sustainably produce palm oil, the ISPO issued by the Indonesian

government also aims to enforce regulations related to sustainable oil palm plantations. It is regulated in the Presidential Decree No. 44 of 2020 on the Certification System of Sustainable Oil Palm Plantations in Indonesia and the Decree of the Ministry of Agriculture No. 38 of 2020 on the Sustainable Oil Palm Plantation Establishment Certification System in Indonesia. The certification system is mandatory national regulation (which matches territorial realities and interests in specific national or subnational jurisdictions) [12]. Some principles of the ISPO include the Principle of Good Plantation Practice (where plantations must be managed by considering the overall environment); the Management of the Environment, Natural Resources, and Biodiversity (where fire must not be used to preserve the natural resources); the Principle of Responsibility towards Labor (where companies must implement the Occupational Safety and Health system)

ISPO also requires fire prevention for independent smallholders. There must be adequate facilities, such as the drainage system, water management, the human resources required to prevent and anticipate fire, and emergency response organization and system [13].

In line with the ISPO principles and criteria requiring zero-fire land-clearing, the Indonesian government issued the Decree of the Ministry of Agriculture No. 5 of 2018 on the Zero-Fire Plantation Land Clearing and Management aims to increase the plantation businesses sustainably and to preserve the environmental functions. It stipulated that the plantation companies which clear and manage plantation lands without fire must beforehand own the Work Plan of Plantation Land Clearing and Management. This Ministerial Decree obliges plantation business owners to provide the management, facilities, and infrastructure to anticipate plantation fires.

The plantation fire prevention management and the system must be equipped with a task force formed by the plantation company. Meanwhile, the independent smallholders are obliged to form *Kelompok Tani Peduli Api* (KTPA/Association of Farmers Concerned with Fire).

3.3. Forest and Land Fires Prevention Using the Sustainable Plantation Approach

There have not been any integrative approaches in controlling forest and land fires. The model for preventing forest and land fires is still carried out using partial and reactionary approaches. The integrative approach emphasizes the managerial increase of company and independent planters through the sustainable plantation certification system to fulfill some principles and criteria. The integrative approach is also carried out by developing forest management through collaboration and partnership of plantation and forest companies with the local communities. The forest and plantation companies' developmental

facilitation towards developing the surrounding people's plantations may be carried out through credit schemes, profit-sharing, and other forms of partnership.

In 2019, 2,611,411 hectares of forest and land in Indonesia were struck by fire. The combination of the El Nino and the PIOD (Positive Indian Ocean Dipole) has caused a dry condition which worsens the agricultural and land-clearing fires in South Sumatra and Borneo [14]. The Analysis of the Forest and Land Fire in Indonesia in 2015 carried out by the National Agency of Disaster Prevention stated that some of the causes of forest and land fires include land-clearing using fire (both legal and illegal); land-burning on purpose so that the companies are blamed, resulting to the revocation of that company's license; the land has HCV/HCS (High Carbon Stock/High Conservation Value). Some land is thought to be unoccupied. Thus it is burned by some individuals to be replanted [15]. The area of the burned forest and land in Indonesia between 2015 to 2020 are shown in Table 1.

Table 1 Area of burned forest and land in Indonesia 2015-2020

Year	2015	2016	2017	2018	2019	2020
Width (Ha)	2,611,411	438,363	165,484	529,267	1,649,258	292,922

Between 2015-2020, from 34 of Indonesia's provinces, the five provinces with the largest burned forests and land area are South Sumatera, Central Borneo, Papua, South Borneo, and East Nusa Tenggara. The area and the percentage of the burned forests and fires in the five top-ranked provinces are shown in Table 2.

Table 2 Area and percentage of burned forests and land in the five top-ranked provinces between 2015-2020

Province	South Sumatera	Central Borneo	Papua	South Borneo	East Nusa Tenggara
Burned area (Ha)	1,012,684	962,902	790,332	447,636	441,775
Percentage (%)	17,81	16,93	13,90	7,87	7,77

An integrative and systematic management model to cope with the forest and land fires should be implemented in the sustainable plantation framework. That is because the forest and land fires are closely related to the unsustainable practices of people in running their business activities. Fire and fuel are preferred to be used in clearing land because of its ease, affordability, speed, and it produces free minerals from the ashes. But this activity must seriously be managed to prevent the degradation of the environmental quality [16].

4. Discussion

4.1. Sustainable Plantation Management and Certification for Independent Smallholders

The area of oil palm plantations in Indonesia certified by RSPO up to June 2019 is 1,972,311 hectares, including the land of the independent smallholders, or 1,965,209 hectares excluding the land of the independent smallholders [5]. According to the Head Secretary of the ISPO Commission, Aziz Hidayat, up to January 2020, 5.45 million hectares of land are certified by the ISPO scheme. It is informed that 621 certificates have been issued, 607 certificates of companies, 10 certificates of independent cooperatives, and 4 certificates of Village Cooperative Unit plasm. Based on these data, the sustainable plantation certification realization through the RSPO and the ISPO by independent smallholders is still low.

In environmental management, the independent smallholders are not ready as they are unaware of the environmental management principles according to the ISPO standard [17]. The farmers have neither the knowledge nor the financial capacities to implement good cultivation and environmental practices [18]. Independent smallholders still clear land using fire for economic efficiency. There needs to be some coaching to the independent smallholders to fulfill the principles of sustainable oil palm plantations as they usually have trouble obtaining adequate knowledge and information to implement good agricultural practices [19]. RSPO has established the RSPO Farmer Academy, which provides coaching modules for the managers of groups and farmers through the Training of Trainers management [20].

The government must also optimize the People's Oil Palm (*Program Peremajaan Sawit Rakyat/PSR*), supported by the Management Agency of the Oil Palm Plantation Fund (*Badan Pengelola Dana Perkebunan Kelapa Sawit/BPD PKS*) for the independent smallholders. This program has three main principles: legality, sustainability, and ISPO certification. The farmers who participate in the PSR program are made sure to fulfill the legality aspect of the land. With the principle of sustainability, the land-clearing process must fulfill the conservatory principles, there must be good cultivation preparation, and there must be environmental and institutional management. To guarantee the implementation of the sustainability principle, the program's participants must obtain ISPO certification on the first harvest [21].

Law No. 39 of 2014 on Plantations as amended with the Law No. 11 of 2020 on Job Creation has obliged the plantation companies who obtained business licenses to cultivate land, which was originally used another way, and areas that originated from the release of forest areas, to facilitate the development of the society's plantations, with the area of 20% of that land's total area. They may facilitate the development of the people's plantations through credit schemes, profit-sharing, other forms of partnerships, or other forms of funding based on the stipulations of the constitutional regulations. Yet, the implementation is not optimum.

The realization in the obligation to facilitate the development of the surrounding society's plantations from 2007 to August 2019 has only reached 28.98 % out of the target area, 2,149,782.18 hectares, based on the Plantation Business License (*Izin Usaha Perkebunan/IUP*) data [22].

The facility in developing the society's plantation contains a ratio legis so that the results of the plantation business activities are not only enjoyed by the plantation companies themselves. The objective is so that the society adjacent to the plantations may obtain benefits and enjoy prosperity from plantation business activities [12]. The criteria of the surrounding society refer to the Decree of the Ministry of Agriculture No. 98 of 2013 on the Plantation Business License Guidelines, which include:

- a. The society whose lands are used for developing plantations with low income according to the constitutional regulations;
- b. They must reside around the location of the cultivation plantation business license or the plantation business license, and
- c. They must be able to manage the plantations.

The social plantation development by the plantation companies is monitored by the governor or regent/mayor based on their authorities, including in its planning, obligation fulfillment, and sustainability of a business. The governor, regent/mayor, and plantation companies must guide the surrounding people to apply good cultivation, harvest, and post-harvest treatment methods.

That gives a win-win solution as the plantation companies have harmonious relations with the people surrounding the plantations. Then people's surrounding plantations may also become a natural barrier to control fire hotspots. The people will also obtain benefits from the business activities in their area.

Article 60 of Law No. 39 of 2014 on Plantations as amended to Law No. 11 of 2020 on Job Creation has regulated administrative sanctions for plantation companies that violate the obligation to develop the surrounding people's plantations.

Sanctions may also be imposed based on Article 15 of Law No. 25 of 2007 on Investment. The administrative sanctions may be in the form of a written warning, limitation of business activities, the temporary dismissal of business activities or investment facilities, or the revocation of business activities and investment facilities. Law No. 39 of 2014 on Plantations as amended with Law No. 11 of 2020 on Job Creation regulates the criteria, the type, the amount of fine, and the method of administrative sanction imposition.

4.2. Social Forestry

The government must optimize the Social Forestry Program through Community-Based Forest Management (CBFM) and Resource-Based Forest

Management (RBFM). The CBFM concept gives a sense that forest management is for the sake of the companies and the people's interests. People are involved in the planning, management, and monitoring processes. Then, RBFM gives a sense that the companies depend on the profit of timber forests. Still, it involves managing all forest resources to give optimized profits for the company and the people's welfare [23].

The rights and the participation of the society in forestry management are regulated in Article 67 to 70 of Law No. 41 of 1999. Article 67 clause (1) regulates that the indigenous people have the right to collect forest products to fulfill daily life, manage the forest via the customary laws that apply that do not contradict the law, and increase welfare. Article 68 clause (2) letter regulates that the society may utilize the forest and the forest products based on the constitutional regulations which apply. Then, Article 70 clause (2) regulates that the government must encourage society's participation through the various useful and effective activities in the forestry sector.

To strengthen the CBFM concept, the government has applied the Decree of the Ministry of Environment and Forestry No. P.83 of 2016 on Social Forestry.

Social Forestry is established to decrease poverty, unemployment, and forest area management/usage gaps. Through the Social Forestry, legal accesses are given to the society through the schemes of The Village Forest Management Rights (*Hak Pengelolaan Hutan Desa/HPHD*), The Social Forest Management Business License (*Izin Usaha Pengelolaan Hutan Kemasyarakatan/IUPHKM*), The Business License of Social Forest Timber Usage (*Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Tanaman Rakyat/IUPHHKHTR*), Customary Forest, Cooperation Agreement Partnership Document (*Kemitraan Naskah Kesepakatan Kerjasama/Kemitraan NKK*), and Partnership License of Social Forestry Usage (*Kemitraan Izin Pemanfaatan Hutan Perhutanan Sosial/IPHPS*). Up to September 2020, the Social Forestry realization has only reached 4.2 million hectares. It is still far from the target of 12.7 million hectares by 2024. Social Forestry is still a national program; thus, it is not funded by the regional budget [24].

The detailed achievements of Social Forestry licenses of each scheme are shown in Table 3 as follows:

Table 3 Social forestry license achievement on 2017-2020

Type of Social Forestry	Village Forest Management Rights (HPHD)	Social Forest Management Business License (IUPHKM)	Business License of Social Forest Timber Usage (IUPHHKHTR)	Customary Forest	Cooperation Agreement Partnership Document (Kemitraan NKK)	Partnership of Social Forestry Usage (IPHPS)
Total area (Ha)	1,792,253	798,527	34 3,387	578,420	771,270	26,148

The largest scheme of Social Forestry is HPHD, with an area of 1,792,253 hectares. It is given to unlicensed production and protected forests. protected forests managed by Perum Perhutani, and special areas in the Forest Management Unit (*Kesatuan Pengelolaan Hutan/KPH*). The lowest scheme is in the form of IPHPS Partnership, with only 26,148 hectares. Partnerships usually require active initiatives from the companies or the regional governments; meanwhile, the Customary Forest scheme involves a difficult process encompassing the regional government regulations that acknowledge the customary people and their area [25]. The Social Forestry must also be developed to support the efforts of (1) forest resource-based economic development and welfare of the local people; (2) acknowledgement of the local and indigenous people's rights in managing the forest; and (3) the forest resource preservation [26].

To achieve social welfare and preserve the forest, there need to be facilities of support and business development for the people who have obtained the Social Forestry licenses [27]. Apart from the government, the State-Owned Business Enterprises, banks, and private-owned businesses must facilitate the

people in obtaining adequate and sustainable economic gain from utilizing the forest resources. The facilities from the central and the regional governments are regulated in Article 61 of the Decree of the Ministry of Environment and Forestry No. P.83 of 2016 on Social Forestry. The facilities may also be given through activities of forestry partnership, funding, post-harvest, business development, and market access.

5. Conclusion

The results of this research offer a systematic prevention conception through the sustainable plantation certification system by implementing some principles and criteria for plantation and forest companies, including independent planters. This research also found a collaboration and partnership concept of plantation and forest companies with independent smallholders and the people around the forest and plantations to create a win-win solution and a healthy relationship. This research also resulted in the following conclusions:

1. Law No. 32 of 2009 on the Protection and the Management of the Environment and Law No. 41 of 1999 on Forestry stipulated that natural resources must

be utilized harmoniously with the environmental functions in sustainable development. The sustainable plantation conception is explicitly regulated in Law No. 39 of 2014 on Plantations, where the plantation development is carried out sustainably by considering the economic, socio-cultural, and ecological aspects.

2. The oil palm certification schemes of RSPO and ISPO are based on principles and criteria correlated to forest and land fires prevention. Both companies and independent smallholders are obliged to fulfill the criteria of these certifications to create sustainable plantations.

3. The forest and land fires prevention model using the sustainable plantation development approach is carried out by: (1) accelerating the coaching and the certification of sustainable plantation for the independent smallholders, (2) executing the obligation to develop the surrounding people's forests, and (3) implementing Social Forestry.

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