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Forest Cover Change and Legal Pluralism in Forest Management: A Review and Evidence from West Sumatra, Indonesia

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ABSTRACTS

This study analyzed the functions of shifting (phenomenon of legal pluralism) and identified forest conversion at Production Forest Management Unit of Dharmasraya (PFMU Dharmasraya), West Sumatra, Indonesia from March 2018 to December 2019 using a qualitative research design with a case study approach. The identification of changes in forest cover analyzed by satellite images using the NDVI method to obtain the distribution of forest cover. Discussion on legal pluralism were examined using a non-ethnographic qualitative research approach through interviews with local communities, companies/permit holders, and related institutions (government). From 2000 to 2019, the PFMU Dharmasraya forest area reduced from 86 to 12%, and plantations increased from 10 to 81% of the total area of 33,539 ha. The legal pluralism of forest ownership occurs because local communities use traditional law, claiming the PFMU Dharmasraya area as Ulayat land. In contrast, the government claims the forest belongs to the state. The motives for the conversion of forest functions are the expansion of oil palm and rubber plantations, forest clearing to mark forest ownership rights, and illegal logging.

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1. INTRODUCTION

Global deforestation rates in the past two decades have increased from 5.6 million to 9.1 million hectares per year. Southeast Asia has the highest deforestation in the world, losing around 32 million hectares of forests from 1990 to 2010 (Stibig *et al.*, 2014). ²³ During this period, Indonesia contributed 61% of the deforestation rate in Southeast Asia. Indonesia has a forest area of 124,022,848.67 hectares, which consists of protection forests covering an area of 29,917,582.84 hectares, production forests covering an area of 72,109,280,489 hectares, and conservation forests covering an area of 23,7398,580.26 hectares. From 2000 to 2012, Indonesia lost 6 million hectares of primary forest (Margono *et al.*, 2014). Deforestation is a global environmental issue because it is a source of greenhouse gas emissions (including the contribution of land-use change) and considered to threaten biodiversity (Rahmat & Mutolib 2016; Pendrill *et al.*, 2019).

Many factors caused deforestation in Indonesia, namely overcoming economic pressures and population growth (Imai *et al.*, 2018), agricultural and plantation expansion (Ting *et al.*, 2011; Vijay *et al.*, 2016; Garrett *et al.*, 2018), illegal logging (Tacconi *et al.*, 2019), development of oil palm plantations (Austin *et al.*, 2017), housing development, road construction, and forest fires (Purnomo *et al.*, 2017).

In the forestry development context, decentralized forest management aims to divide the roles and responsibilities of forest management between communities and government (Poudyal *et al.*, 2020). The division of the role of forest management has been conducted both to State-Owned Enterprise (SOEs), private parties, and community. Several studies have shown that local communities can preserve forests as in Tanzania (Massawe, 2011), and the Brazilian Amazon (Zimmerman, 2011). But at the same time, decentralization has encouraged

local communities to claim rights to forest areas as Ulayat/adat land (Mutolib *et al.*, 2016). It has resulted in deforestation and conflict over forest ownership in several regions of Indonesia (Purnomo & Anand, 2014).

Private companies and SOEs involvement in the Dharmasraya PFMU forest management proved unable to manage forests well. Forest management in the PFMU Dharmasraya has a long history. In 1982, a forest permit granted to PT. Ragusa, in the form of Forest Management Rights (FMR), after its expiration, in 2002, Forest management was given to PT. Inhutani with an Industrial Plantation Forest (IPF) permit, and in 2013 the PFMU Dharmasraya formed. Forest management by the private sector and the government does not make the forest better. Instead, it is going beyond far from better based on its sustainability aspect. Forests managed by private companies and the government cause conflicts over forest ownership with local communities. Local community claims against forests in the PFMU Dharmasraya area follow the Minangkabau adat law, which accepts the existence of Ulayat land in West Sumatra. The local community's claim to the forest is used by those who have an interest in the woods to clear forest.

Legal pluralism defined as a situation where two or more legal systems work side by side in an area of social life (Griffiths, 1986) or describe a situation in which two or more legal systems interact in one social life. Legal pluralism in the Dharmasraya PFMU region harms forests. Massive conversion of forests caused the community to seize and open rubber and oil palm plantations. The local community's motives (indigenous peoples) in clearing production forests (legally owned by the government) because ⁵ the community considers the position of adat ² law in forest ownership is higher than state law.

Deforestation and forest conversion facts in the PFMU Dharmasraya area

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conducted by local/indigenous communities are fascinating to study. General facts provide an overview that if ownership and management of forests is given to local/indigenous communities. Then they could preserve the forest from damage and other things, better than any other party (Massawe, 2011; Zimmerman, 2011). Also, many parties consider local/indigenous communities to be the only ones capable of preserving the forest. However, the facts in the Dharmasraya PFMU in which the local community is involved in forest clearing and conversion are different from general facts about local communities and forest sustainability. This research aims to analyze the conversion of forest functions and legal pluralism phenomena and identify the motives and causes of forest conversion in the PFMU Dharmasraya.

2. LITERATURE REVIEW

2.1. Deforestation in Indonesia

Deforestation refers to a conversion of forest area for non-forest purposes, such as agricultural or development purposes (Ken *et al.*, 2020). It is a problem that often occurs in tropical developing countries (Kissinger, 2020) that diminishes biological diversity and worsening greenhouse effects (Pravedello *et al.*, 2019). There are two categories of cause of deforestation (Angelsen & Kaimowitz, 1999), direct and indirect factors. The first category, i.e., the direct factor, involves factors directly associated with land degradation, while the second category, i.e., indirect factor, includes social background factors that trigger the direct factor. Geist and Lambin (2002), based on their analysis of deforestation patterns in 152 countries, mention three dominant sources of deforestation, namely, agricultural expansion, forest logging, and infrastructure development. These factors interact with five primary factors, including demographic,

economic, technological, policy, and cultural variables (Geist & Lambin, 2002).

In Indonesia, 50.5 million ha, or 40.71% of Indonesian forest has been damaged between 1985 until 2013. The conversion of forests into palm oil plantations is the main driver of deforestation in Indonesia (Tacconi *et al.*, 2019). Palm oil plantation expanded by 2.2 million Ha in 1996, then 5.4 million Ha in 2006, and 11.6 million ha in 2016. Massive deforestation results in higher carbon emission and risks of biological diversity loss (Murray *et al.*, 2015). High global demands on agricultural commodities, rising rice prices, and land resources privatization are the drivers of massive palm oil plantation expansion, especially in a land with unclear ownership status like peat swamp forests (Miettinen *et al.*, 2012). Deforestation is also caused by increases in coffee and cocoa production on a small-medium scale (Ordway *et al.*, 2017).

2.2. Legal Pluralism in Community

Legal pluralism, in general, is defined as a situation where one or more legal systems work together in the same field of social life (Griffiths, 1986). Benda-Beckman (1989) defines it as a condition where one or more legal systems or institutions work simultaneously in people activities and relationships. In the field of legal pluralism, the state law exists on one hand while on the other hand, the community laws also prevail (the law that principally does not stem from the state's law), which such as customary law, religious law, tradition, or other social conventions that are viewed as a law.

The concept of legal pluralism could be distinguished into two types, strong legal pluralism and weak legal pluralism (Tamanaha, 2008). The former is another form of legal centralism since, despite the state law's recognition of other legal systems, the state law is viewed as superior in the state's legal hierarchy. Meanwhile, the

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latter refers to the presence of a plurality of legal systems in the community. Thus, there is no hierarchy indicating that one legal system is more dominant than the others (Benda-Beckmann & Turner, 2018).

2.2.1. Land tenure and legal pluralism

Land tenure system describes the rights of the land. These rights are seldom held by only one party. A land parcel may be held by several parties who hold different types of rights upon the land, known as “bundle of rights” (Gilbert, 2013). In the Indonesian context, an example of bundle of rights could be seen in national parks where the state holds their ownership right and every citizen holds the right to visit and enjoy their natural beauty (Pratomo *et al.*, 2020), while the community who lives around or in those national parks holds the right to use the natural resources for their welfare, which is limited to the right to collect forest products (Ifrani *et al.*, 2019).

The relationship between natural resources ownership rights and legal pluralism may vary from a community to another. A community may prefer a law that brings advantage over individuals (Bedner & Arizona, 2019). In natural resource conflicts, every party brings their claim based on their local knowledge and power relation they understand (Assche *et al.*, 2017). The disputing party would apply a certain law that strengthens their claim and brings them advantages over other parties. Such a process is known as “forum shopping” (Benda-Beckmann, 1989). This was what happened in PMFU Dharmasraya, where the local community preferred customary law as their basis to claim their ownership upon the forest, making them feel rightful to control and clear the land

2.2.2. Conflict and legal pluralism in Forest Management: A case study

The literature on forest management in Indonesia noted some land ownership conflicts between indigenous people and the

state/the forest companies. In general, these conflicts deal with the claim of forest ownership (Muur, 2018). These conflicts occur because the state and companies exploit the forest land to open plantation areas. As a reaction, indigenous people seize the forest from companies and turn it into their own plantation area (Sylviani & Hakim, 2014; Mutolib *et al.*, 2017).

Forest conflicts due to different claims of forest ownership are found in many countries with indigenous communities, especially in the Southeast Asian region (Yasmi *et al.*, 2013). These conflicts occur because of the different legal bases for claiming the rights upon the forest (Moeliono *et al.*, 2017). In Myanmar, forest conflicts arise because the customary law is inferior to the state law, which makes the government transfers the right to manage the forest to private parties for investment reasons. In northern Thailand, conflicts in natural resources management occur due to different interests and goals (Dhiaulhaq *et al.*, 2017).

Meanwhile, in Indonesia, forest and tenurial conflicts could not be separated from the aspect of legal pluralism (Mutolib *et al.*, 2017). In West Nusa Tenggara, conflict arises between indigenous people and a logging company that received a management permit from the government (Magdalena, 2013). Meanwhile, in West Rinjani, the Indigenous people conflicted with a company and the government, they claimed that the forest belongs to adat forest and turned it into a plantation area (Handoko & Yumantoko, 2015). Another conflict occurs in Rimbo Donok protected forest, Bengkulu Province, ²⁴ between the indigenous people and the government due to the prohibition to manage protected forest areas. At the same time, people claimed the forest as a customary land they could manage (Senoaji *et al.*, 2019). In some places in South Sulawesi, conflicts occur because both government and indigenous people claimed forest ownership (Muur, 2018).

Indonesia is prone to forest conflict as indigenous people, with their customary law, may claim a forest area as customary forest. Accordingly, it is necessary to have collaboration between the government, indigenous people, and involving parties to settle tenurial issues in Indonesia.

2.3. Customary Land in West Sumatra

Under Article 1 of the West Sumatra Regional Regulation (Perda Sumatra Barat) no. 16 of 2008 on Customary Land and its Use, customary land is defined as a hereditary land parcel and natural resources therein that belongs to the customary right of the indigenous people. Customary right, according to Minangkabau teachings in West Sumatra Province, refers to a power or authority held by the indigenous community over certain spaces or areas where they live to enjoy the natural resources to survive (Fatmi, 2018; Warman & Andora, 2014). Customary right is the highest ownership right upon spaces and area in Minangkabau (Hidayat, 2015).

Customary land does not only belong to the present community but also to the future generation. Customary right bears three dimensions: first, Customary right as a right upon the land the people inherit from their ancestors, the founder of their Nagari (Nagari is a traditional organization considered the smallest local government unit in West Sumatra). Second, customary right serves as an equal right held by all Nagari people; and third, customary right as a right that belongs to the present and future generation (Warman & Andora, 2014).

The customary right covers a range of aspects contained in water, land, and airspace in Minangkabau territory (Jonaidi, 2018). However, in practice, Minangkabau people often see customary rights and customary land as the same matter since they assume that water and airspace are inseparable elements of a land.

3. RESEARCH METHODS

3.1. Research Location and Time

The research location is in the Regency of Dharmasraya, West Sumatra Province. Geographically the area of the Dharmasraya Regency is in the southeastern tip of West Sumatra with geographic coordinates between 000 47 '7 "- 010 41" 56 "South Latitude and 1010 9" 21 "east longitude - 1010 54" 27 "East Longitude. The condition and topography of the Dharmasraya Regency are mostly flat land with elevations from 82 meters to 5,525 meters above sea level. The area covers 2,961.13 km²/296,113 Hectares and there are divided into eleven districts and 52 villages. Specifically, the research location is in the working area of the PFMU Dharmasraya, which covers an area of 32,749 hectares of production forest (Mutolib *et al.*, 2017). Administratively, the PFMU Dharmasraya is part of the Nagari (Village) Bonjol and Abai Siat areas in the Koto Besar District, and Nagari Sikabau and the Sungai Dareh in the Pulau Punjung Sub-District. By adat law, forests in the work area of the PFMU Dharmasraya are communal land owned by local communities from those four villages.

Research time divided into two stages. The first phase is a preliminary study that aims to identify the location of the research and identify problems that occur related to forest management in March 2018. After the initial analysis, the problem formulation and research objectives arranged by the findings that have been collected in the preliminary research. According to exploratory analysis, data collection to answer the problem formulation and research objectives was conducted from February to December 2019.

3.2. Research Methods and Data Sources

The study used a qualitative research design with a case study approach. Qualitative research format aims to describe, summarize various conditions, situations, or

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phenomena of social reality, and try to pull that reality to the surface as a characteristic, character, nature, model, or description of a particular condition, situation, or phenomenon, or research for collect and analyze data in the form of words (oral and written) and human actions and not try to quantify the data that has been obtained.

The data type used in this study is primary data and secondary data. Primary data were obtained through key informant interviews, direct observation, and documentation. Secondary data were obtained from literature searches/literature studies and reports/documents from various agencies related to research studies.

The identification of forest cover changes was analyzed by satellite imagery. Map Obtained from the earthexplorer.usgs.gov website and downloaded by the data of the year that searched. Landsat map data processed using the NDVI method to obtain cover distribution in PFMU Dharmasraya. NDVI (Normalized Difference Vegetation Index) is a mathematical combination between the red band and the NIR (Near-Infrared) band used to facilitate the use and vegetation. The high and low density of vegetation is known by using NDVI. NDVI values range from -1 (negative) to 1 (positive). NDVI-based vegetation index has a value of -1 (non-vegetation) to 1 (vegetation). Areas that have an NDVI vegetation level value below 0.2 means that area is not include in the vegetation group (can be open or rocky land). Areas above 0.4 have areas covered by vegetation with moderate density. The index results adjusted to the actual conditions on the original map (composite band 4-3-2 results).

NDVI results corrected by natural composite bands (bands 4-3-2). This merger aims to facilitate the analysis of NDVI data processing from Landsat imagery. NDVI calculations are $(NIR - Red)/(NIR + Red)$. Image processing using Arc GIS 10.3. Calculation of the area of land use data using

the raster calculator tools—threshold values adjusted to the actual state of the original composite band results.

Research related to legal pluralism is reviewed by non-ethnographic qualitative research because researchers do not involve in the community group's social life to collect data. Key informants are from local communities, companies/permit holders, relevant authorities (government), and buyers who are gardening in the work area of PMFU Dharmasraya. Key informants from the local community consisted of Wali Nagari, KAN Chairperson, Ninik Mamak, Ulayat ruler to gather information related to Ulayat management and how to link the release of Ulayat land. Determination of informants using snowball sampling.

3.3. Data Analysis Technique

Data analysis has been conducted since formulating and explaining the problem, before going into the field, and continuing until writing the results of research or analysis that is ongoing. Data collection and analysis activities in this study are not separate from each other. Both take place simultaneously, and the process takes the form of a cycle. This study uses interactive model data analysis, which consists of three stages: data reduction, data display, and concluding/verification. Analysis of satellite imagery to analyze land cover and land area in the work area of the PFMU Dharmasraya since 2000 and 2019 using spatial/GIS analysis (Rahmat et al., 2018). The land cover analysis uses NDVI (Normalized Difference Vegetation Index) data processing from Landsat 7 images (in 2000) and Landsat 8 (2019). The analytical tool used is ArcGis 10.3.

4. RESULTS AND DISCUSSION

4.1. Research Area Overview

PFMU Dharmasraya is in the area of Dhamasraya Regency, West Sumatra Province. PFMU Dharmasraya where geographically located at coordinates 01

03'30 "South Latitude-01 22'00" South Latitude and 0 0 101 24'30 "East Longitude-101 38'00" East Longitude. Administratively, the PFMU Dharmasraya located in Pulau Punjung and Koto Besar Sub-District.

The PFMU Dharmasraya is 33,539.9 hectares of Permanent Production Forests and Limited Production Forests. The PFMU Dharmasraya was form based on the proposal of the Regent of Dhamasraya according to letter Number 130/684/BPT/VIII-2013 dated August 2, 2013, and determined based on the Decree of the Minister of Forestry of the Republic of Indonesia No. SK. 695/Menhut-II/2013, dated October 21, 2013.

Based on its history, the Dharmasraya PFMU area has experienced several times of permit changes. In 1972 this forest area was a Forest Concession (FC) granted to PT. Ragusa with an area of ± 66,000 hectares. After the FC's expiration in 2002, a portion of the FC area became a production forest that could be approved and granted by the Cultivation Rights to three oil palm plantation companies, namely PT. Raya Raya, PT. SMP and PT. AWB with an area of 32,450 hectares. The remaining concessions of PT. Ragusa covering an area of 32,749.95 hectares was then given to three utilization permit holders, namely PT. Inhutani, Dara Silva, and Bukit Raya Mudisa (BRM) as Industrial Plantation Forests (IPF). In 2013, IPF, which was control by Dhara Silva, Inhutani, and BRM, was established as the PFMU Dharmasraya. The function of the PFMU Dharmasraya is following Government Regulation No. 6 of 2007 Jo Government Regulation No. 3 of 2008 concerning Forest Management, Preparation of Forest Management Plans, and Forest Utilization, namely carrying out site/field level forest management, carrying out the duties and functions of the Forestry Service such as organizing forest administration.

4.2. Forest Cover Change

Satellite images analysis in the PFMU Dharmasraya area was conduct in two stages. The first phase was in the range of 2000 to 2014. The year 2000 was chosen because of the permits expiration period of the PT. Ragusa, and in 2013 the PFMU Dharmasraya permits covering 33,539 hectares of production forest was granted by the Ministry of Forestry of the Republic of Indonesia.

Land cover analysis in 2000 (the end of the FMR) to 2014 illustrates that there has been rapid forest conversion (deforestation). In 2000 the secondary forest in the PFMU Dharmasraya was 86%, the area of open land and plantations was 3% and 10%, respectively. At the end of 2014, forest cover in the PFMU Dharmasraya decreased very significantly, remaining 18%. Plantations (rubber and palm oil) increased dramatically from 10% in 2000 to 59% in 2014. Open land amounted to 10% and shrubs (left logged forest) around 12% (See **Figures 1, 2, and 3**). The results of the analysis of satellite imagery provide insight that forest conversion in the PFMU Dharmasraya is happening quickly. It is interesting to study the factors and motives underlying the process of forest conversion.

In November 2019, the land cover analysis was conduct in the PFMU Dharmasraya area again. The results of satellite imagery analysis show that in the PFMU Dharmasraya area dominated by low-density vegetation (plantations) which has an area of 81%, and the field of land that has a medium-density (secondary forest) is decreasing, which is only around 12%. In 2014, the area of secondary forests in PFMU Dharmasraya, it is still approximately 18%. There has been a massive change in forest cover and function from 2000 to 2019.

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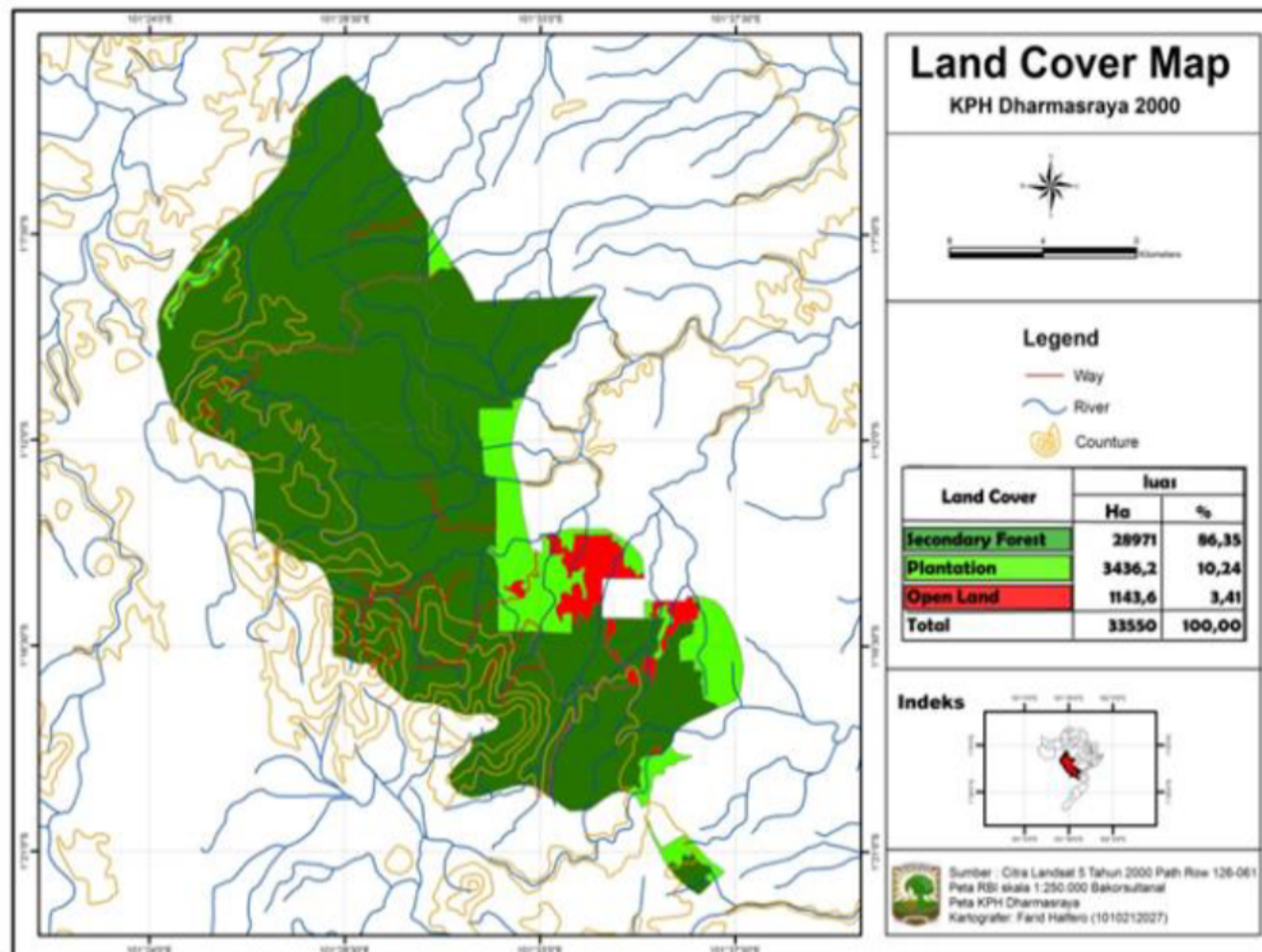


Figure 1. Forest cover of PFMU Dharmastraya in 2000

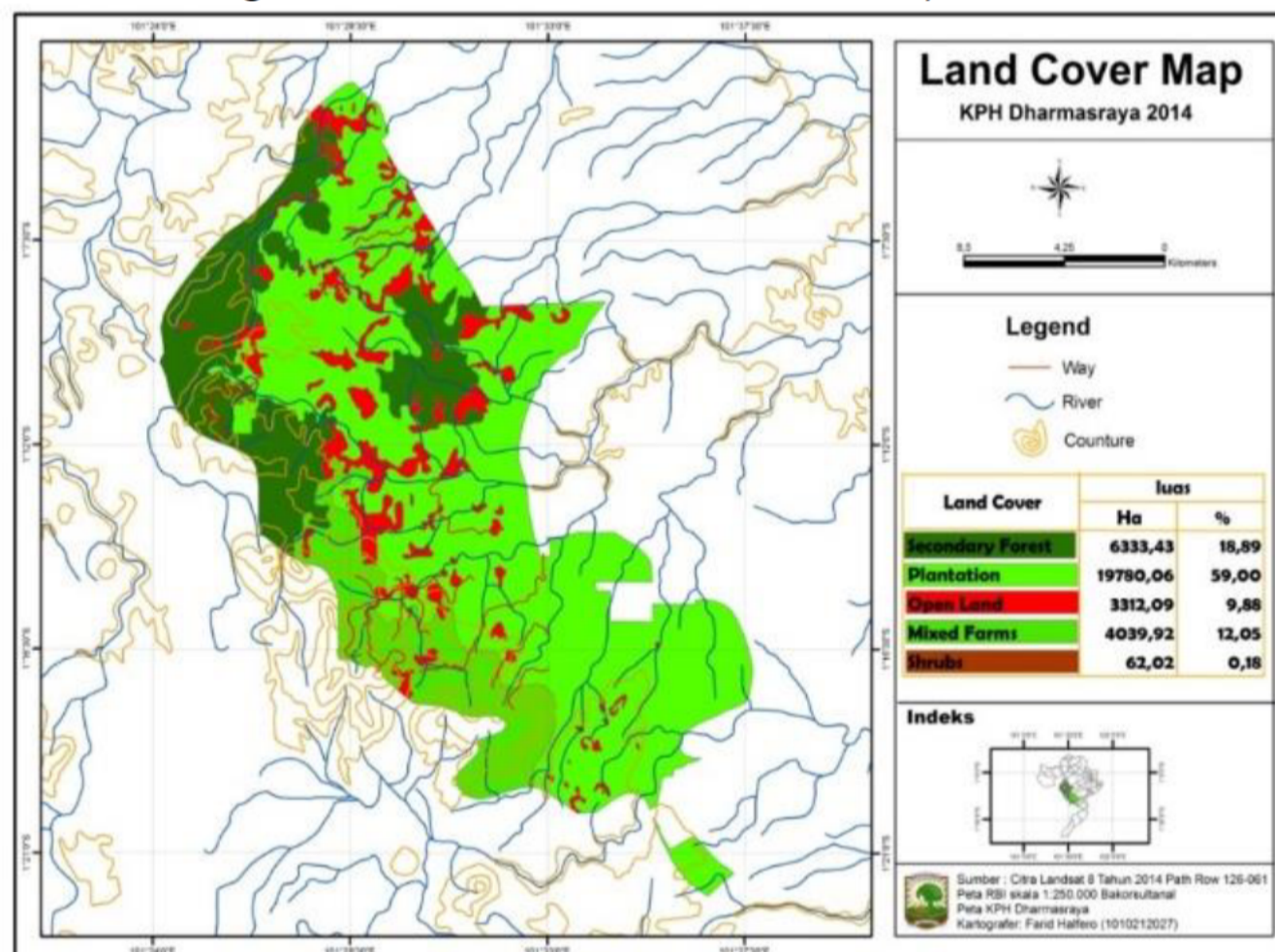


Figure 2. Forest cover of PFMU Dharmastraya in 2014



Figure 3. Forest cover of PFMU Dharmasraya in 2019

Forest cover changes at the PFMU Dharmasraya supported by easy access to the forest through the former FMR project road, the prices rising for rubber and palm oil, encourage many parties to open plantation, both local and outside communities. Agricultural expansion becomes one of the deforestation causes (Ting *et al.*, 2011; Dalla-Nora *et al.*, 2014). It also happened in the work area of the PFMU Dharmasraya, that the plantation opening triggered deforestation. Besides, the forest functions conversion in the PFMU Dharmasraya was due to local communities' involvement in the forest clearing process for plantations. Forest clearing by local communities is due to legal pluralism or differences in claims of forest ownership between local communities and the state (and permit holders). The differences in ownership

claims have led to community conflicts with the state and permit holders.

People are encouraged to seize and plant in the forest due to legal pluralism, in which the community recognizes the forest as their traditional land. The community did not recognize the holders of IPF permits in forest management. Legal pluralism triggers a forum shopping where people use a legal basis that is more in favor of their interests, namely adat law (Benda-Beckman, 1989). In conflicts over ownership of natural resources, every individual in a community can use various categories to claim and obtain natural resources (Ratner *et al.*, 2013). Claims of forests as Ulayat land are used by local communities to control forests in the PFMU Dharmasraya.

4.3. Forest Ownership Pluralism: State Law vs Adat Law

As explained in the previous section, two legal systems are used in forest ownership claims in the PFMU Dharmasraya. Local people use adat law and claim the PFMU Dharmasraya area as Ulayat land, and the government claims the forest belongs to the state. It has triggered massive deforestation and land-use change at PFMU Dharmasraya.

The forest conversion phenomenon in the PFMU Dharmasraya is a weak legal pluralism form. Unfortunately, it is not the state law that dominates over customary law, but vice versa. In some areas, the majority of adat law is weaker than the state law, but the case in the PFMU Dharmasraya is different. It could happen because Dharmasraya Regency is a part of the Minangkabau region, whose people have a high determination in holding customs, including the adat land system. In the Minangkabau community, land management has been regulated and explained its boundaries very well.

People are encouraged to buy land at the PFMU Dharmasraya and open a plantation inside it because of the adat forests recognition that is higher than state law. Plantation activities in the forest are not considered illegal because they have obtained land under applicable traditional provisions. Buying and selling forests in the PFMU Dharmasraya work area is similar to what happened in Tesso Nilo National Park, that its deforestation is caused ¹⁴ by local people who see the forest as Ulayat land (Poor et al., 2019). Although not permitted by the government, the ²⁰ transfer of ownership rights (the sale and purchase of Ulayat land in the forest) is conduct according to traditional/adat provisions. It is considered sufficient as legal proof of land ownership, and able to provide a

security sense for those who plant in the forest.

4.4. "Forum Shopping": Forest Tenure Competition at PFMU Dharmasraya

The competition between the community and the government occurs because each party is fighting over the forest ownership of the PFMU Dharmasraya with different laws (Mutolib et al., 2019). Legal pluralism in the PFMU Dharmasraya area triggered a forum shopping where the community used the adat law to support their interests. Ultimately, legal pluralism triggers conflicts of interest in forest management between communities and the government. Sellers and buyers of Ulayat forests use adat law as the basis for legal claims of forest ownership in the PFMU Dharmasraya.

Due to differences in the law that use by each party, the community and other parties who are pro to adat law continue to clear the forest using adat law claims. The cleared forest means that the forest has been owned by the clearing party so that the company or other party has no right to possess it. If there are parties who want to possess that land (especially the company), then they are required to compensate with a price range of Rp. 10,000,000 to 15,000,000 per hectares. This condition is used by many parties, especially those with the financial power to clear land in the broadest forest. In the end, this has an impact on the massive conversion of forest functions in the PFMU Dharmasraya.

4.5. Motives for Forest Clearing

The main motive of forest clearing is the need for plantation expansion. Another reason behind forest clearing is to mark property rights. Many parties open forests only to sign ownership

rights in the forest. After the forest is cleared, the owner leaves the land without planting it. Forest clearing aims to obtain forest claims. Forests clearing intended to mark ownership is conduct with the aim of ensuring forest ownership. Thus, it can be planted in the future, providing forest ownership rights and obtaining compensation from companies holding IPF permit if the company intends to take over the forest. Forest clearing in the PFMU Dharmasraya area is carried out by burning it because it is considered more effective and efficient. Forest burning activities are often found in the PFMU Dharmasraya.

Another motive for forest clearing at the PFMU Dharmasraya is illegal logging. From the adat law perspective, logging is not unlawful. Communities can take wood if they have obtained permission from the Ulayat authorities. It is a form of forum shopping in legal pluralism where the community only uses adat law to utilize the forest through logging. Finally, to against this problem, additional education is important (Soegoto et al., 2021; Maryanti et al., 2021; Mohamad & Masek, 2021).

5. CONCLUSION

Forest conversion in PFMU Dharmasraya happened very fast and massive. In 2000 forest area was 86% of the total area of 33,539 hectares, and the plantation area was 10%. In 2019 the remaining forest area in the PFMU Dharmasraya remained 12%, and the plantation area increased significantly to

81%. The legal pluralism of forest ownership in the PFMU Dharmasraya occurs because local communities use adat law and claim the PFMU Dharmasraya area as Ulayat land. In contrast, the government claims the forest as state property. Legal pluralism in the PFMU Dharmasraya is a weak legal pluralism form, in which adat law dominates state law in forest ownership claims. Legal pluralism in the PFMU Dharmasraya area triggered a forum shopping in which the community used an adat law as a basis rather than state law for forest ownership because it was more beneficial for access to open and sell the land the forest. There are three motives for forest clearing in the PFMU Dharmasraya, namely expansion of oil palm and rubber plantations, forest clearing to mark forest property rights, and illegal logging by communities of Ulayat landowners.

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7. AUTHORS' NOTE

Authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

8. REFERENCES

- Angelsen, A., and Kaimowitz, D. (1999). Rethinking the Causes of Deforestation: Lessons from Economic Models. *The World Bank Research Observer*, 14(1), 73–98.
- Assche, K.V., Beunen, R., Duineveld, M., and Gruezmacher, M. (2017) Power/knowledge and natural resource management: Foucaultian foundations in the analysis of adaptive governance. *Journal of Environmental Policy and Planning*, 19(3), 308-322.
- Austin, K. G., A. Mosnier., J. Pirker., I. McCallum., S. Fritz., and P. S. Kasibhatla. (2017). Shifting patterns of oil palm driven deforestation in Indonesia and implications for zero-deforestation commitments. *Land Use Policy*, 69, 41–48.
- Bedner, A., and Arizona, Y. (2019). Adat in Indonesian Land Law: A Promise for the Future or a Dead End?. *The Asia Pacific Journal of Anthropology*, 20 (5), 416-434 |.
- Benda-Beckman, F. von. (1989). From the Law of Primitive Man to the Socio-Legal Study of Complex Society. *Jurnal Antropologi Indonesia*, 49, 67–75.
- Benda-Beckmann, K.V., and Turner, B. (2018). Legal pluralism, social theory, and the state. *The Journal of Legal Pluralism and Unofficial Law*, 50 (3), 255-274.
- Dalla-Nora, E.L., de Aguiar, A.P.D., Lapola, D.M., and Woltjer, G. (2014). Why have land use change models for the amazon failed to capture the amount of deforestation over the last decade?. *Land Use Policy*, 39, 403–11.
- Dhiaulhaq, A., Wiset, K., Thaworn, R., Kane, S., and Gritten, D. (2017). Forest, water and people: The roles and limits of mediation in transforming watershed conflict in Northern Thailand. *Forest and Society*, 1(2), 121-136.
- Fatmi, S.R. (2018). Permohonan Tanah Ulayat di Minangkabau Menjadi Tanah Hak Milik. *Lentera Hukum*, 5(3), 415-430
- Garrett, R. D., Koh, I., Lambin, E.F., Waroux, Y.L.P.D., Kastens, J.H., and Brown, J.C. (2018). Intensification in Agriculture-Forest Frontiers: Land Use Responses to Development and Conservation Policies in Brazil. *Global Environmental Change*, 53, 233–43.
- Geist, H. J., and Lambin, E. F. (2002). Proximate Causes and Underlying Driving Forces of Tropical Deforestation. *BioScience*, 52(2), 143.
- Gilbert, J. (2013). Land Rights as Human Rights: The Case for a Specific Right to Land. *International Journal on Human Rights*, 10(18), 115-135.
- Griffiths, J. (1986). What is legal pluralism?. *Journal of Legal Pluralism and Unofficial Law*, 24, 1–56.

- Handoko, C. and Yumantoko. (2015). Local perspectives on tenure rights and conflict in FMU Rinjani Barat, West Nusa Tenggara Province. *Jurnal Penelitian Kehutanan Wallacea*, 4(2), 157-170
- Hidayat, H. (2015). Pengakuan hukum terhadap hak Ulayat masyarakat hukum adat. *Jurnal Hukum Tô-râ*, 1 (3), 183-192
- Ifrani, I., Abby, F.A., Barkatullah, A.H., Nurhayati, Y., and Said, M.Y. (2019). Forest management based on local culture of dayak Kotabaru in the perspective of customary law for a sustainable future and prosperity of the local community. *Resources*, 8 (78), 1-17.
- Imai, N., Furukawa, T., Tsujino, R., Kitamura, S., and Yumoto, Y. (2018). Factors affecting forest area change in Southeast Asia during 1980-2010. *PLoS ONE*, 13(6), e0199908.
- Jonaidi, J. (2018). Kajian hukum terhadap kedudukan tanah Ulayat masyarakat hukum adat Minangkabau di Sumatera Barat. *Lex Et Societatis*, 6(1), 97-106.
- Ken, S., Sasaki, N., Entani, T., Ma, H.O., Thuch, P., and Tsusaka T.W. (2020). Assessment of the local perceptions on the drivers of deforestation and forest degradation, agents of drivers, and appropriate activities in Cambodia. *Sustainability*, 12 (9987), 1-26.
- Kissinger, G. (2020). Policy responses to direct and underlying drivers of deforestation: Examining rubber and coffee in the central highlands of Vietnam. *Forests*, 11 (733), 1-25.
- Magdalena, M. (2013). The roles of customary law in forest management and protection in Sesaot Village, West Nusa Tenggara and Setulang Village, East Kalimantan. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 10 (2), 110 – 121.
- Margono, M., Arunarwati, B., Potapov, P.V., Turubanova, S., Stolle, F., and Hansen, M.C. (2014). Primary forest cover loss in Indonesia over 2000-2012. *Nature Climate Change* 4(8), 730–35.
- Maryanti, R., Nandiyanto, A. B. D., Hufad, A., and Sunardi, S. (2021). Science education for students with special needs in Indonesia: From definition, systematic review, education system, to curriculum. *Indonesian Journal of Community and Special Needs Education*. 1(1), 1-8.
- Massawe, J. (2011). *Indigenous people and conservation: The Suledo forest community in Tanzania*. Pp. 73–80 in *Indigenous peoples and conservation: from rights to resource management*, edited by W. K. Painemilla, A. B. Rylands, A. Woofter, and C. Hughes. Arlington: Conservation International.

- Miettinen, J., Hooijer, A., Shi, C., Tollenaar, D., Vernimmen, R., Liew, S., Malins, C., Page, S. E. (2012). Extent of industrial plantations on Southeast Asian peatlands in 2010 with analysis of historical expansion and future projections. *GCB Bioenergy*, 4(6), 908–918.
- Moeliono, M., Thuy, P.M., Bong, I.W., Wong, G.Y., and Brockhaus, M. (2017). Social Forestry – why and for whom? A comparison of policies in Vietnam and Indonesia. *Forest and Society*, 1(2), 1-20.
- Mohamad, N., and Masek, A. (2021). Modes of Facilitator Skills for Group Learning Among Design and Technology Teachers in Secondary Schools. *Indonesian Journal of Teaching in Science*, 1(1), 17-20
- Murray, J.P., Grenyer, R., Wunder, S., Raes, N., and Jones, J.P.G. (2015). Spatial patterns of carbon, biodiversity, deforestation threat, and REDD+ projects in Indonesia. *Conservation Biology*, 29(5), 1-12.
- Mutolib, A., Yonariza, Rahmat, A., and Yanfika, H. (2019). Competition among actors and challenges of production forest management in Dharmasraya, West Sumatera. *Conference Series: Earth and Environmental Science*, 399, 012074
- Mutolib, A., Yonariza., Mahdi., and Ismono, H. (2016). Gender inequality and the oppression of women within minangkabau matrilineal society: A case study of the management of ulayat forest land in Nagari Bonjol, Dharmasraya district, West Sumatra Province, Indonesia. *Asian Women*, 32(3), 23-49.
- Mutolib, A., Yonariza., Mahdi., and Ismono, H. (2017). Forest ownership conflict between a local community and the state: A case study in Dharmasraya, Indonesia. *Journal of Tropical Forest Science*, 29(2), 163–71.
- Muur, W.V.D. (2018). Forest conflicts and the informal nature of realizing indigenous land rights in Indonesia. *Citizenship Studies*, 22 (2), 160–174.
- Ordway, E.M., Asner, G.P., and Lambin, E.F. (2017). Deforestation risk due to commodity crop expansion in subSaharan Africa. *Environmental Resources Letters*, 12 (044015), 1-12.
- Pendrill, F., Persson, U.M., Godar, J., Kastner, T., Moran, D., Schmidt, S., and Wood, R. (2019). Agricultural and forestry trade drives large share of tropical deforestation emissions. *Global Environmental Change*, 56, 1–10.
- Poor, E.E., Frimpong, E., Imron, M.A., and Kelly, M.J. (2019). Protected area effectiveness in a sea of palm oil: A Sumatran case study. *Biological Conservation*, 234, 123–30.
- Poudyal, B.H., Maraseni, T., and Cockfield, G. (2020). Scientific forest management practice in Nepal: Critical reflections from stakeholders' perspectives. *Forests*, 11(1), 1–20.

- Pratomo, R.A., Samsura, D.A.A., and Krabben, E.V.D. (2020). Transformation of local people's property rights induced by new town development (case studies in Peri-Urban areas in Indonesia). *Land*, 9, (236), 1-25.
- Purnomo, H., Shantiko, B., Sitorus, S., Gunawan, H., Achdiawan, R., Kartodihardjo, H., and Dewayani, A.A. (2017). Fire economy and actor network of forest and land fires in Indonesia. *Forest Policy and Economics*, 78, 21–31.
- Purnomo, P.E., and Anand, P. (2014). The conflict of forest tenure and the emergence of community based forest management in Indonesia. *Journal of Government and Politics*, 5(1), 20–31.
- Rahmat, A., and Mutolib, A. (2016). Comparison of air temperature under global climate change issue in Gifu city and Ogaki city, Japan. *Indonesian Journal of Science and Technology* 1(1), 37–46.
- Rahmat, A., Hamid, M.A., Zaki, M.K., and Mutolib. A. (2018). Normalized difference vegetation index (NDVI) in the integration conservation education forest at Wan Abdul Rachman using modis data. *Indonesian Journal of Science and Technology*, 3(1), 47–52.
- Ratner, B.D., Meinzen-Dick, R., May, C., and Haglund, E. (2013). Resource conflict, collective action, and resilience: An analytical framework. *International Journal of the Commons*, 7(1), 183–208.
- Senoaji, G., Hidayat, M.F., and Iskandar. (2019). The tenurial conflicts resolution of utilization of forest areas in protected forests Rimbo Donok Kepahiang District. *Jurnal Manusia dan Lingkungan*, 26(1), 28-35.
- Soegoto, E. S, Ramana, J. M. & Rafif, L. S. (2021). Designing an Educational Website Regarding Recycling of Plastic Waste into Roads. *ASEAN Journal of Science and Engineering Education*. 1(2), 125-130
- Stibig, H. J., Achard, F., Carboni, S., Raši, R., and Miettinen, J. (2014). Change in Tropical Forest Cover of Southeast Asia from 1990 to 2010. *Biogeosciences* 11(2), 247–58.
- Sylviani, S., and Hakim, I. (2014). Analisis tenurial dalam pengembangan kesatuan pengelolaan hutan: Studi kasus KPH Gedong Wani, Provinsi Lampung. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 11(4), 309–322.
- Tacconi, L., Rodrigues, R.J., and Maryudi, A. (2019). Law Enforcement and Deforestation: Lessons for Indonesia from Brazil. *Forest Policy and Economics*, 108(101943), 1–10.
- Tamanaha, B. Z. (2008). Understanding legal pluralism: Past to present, local to global. *Sydney Law Review*, 30 (375), 375-411.

- Ting, Z., Haiyun, C., Shivakoti, G.P., Cochard, R., and Homcha-aim, K. (2011). Revisit to community forest in Northeast of Thailand: Changes in status and utilization. *Environment, Development and Sustainability*, 13(2), 385–402.
- Vijay, V., Pimm, S.L., Jenkins, C.N., and Smith, S.J. (2016). The impacts of oil palm on recent deforestation and biodiversity loss. *PLoS ONE*, 11(7), e0159668.
- Warman, K., and Andora, H. (2014). Pola Hubungan Hukum dalam Pemanfaatan Tanah Ulayat di Sumatera Barat. *Mimbar Hukum*, 26 (3), 366-381.
- Yasmi, Y., Kelley, L.C., and Enters, T. (2013). Community–outsider conflicts over forests: Perspectives from Southeast Asia. *Forest Policy and Economics*, 33, 21-27.
- Zimmerman, B. (2011). *Beauty, power, and conservation in the Southeast Amazon: How traditional social organization of the Kayapo leads to forest protection*. edited by W. K. Painemilla, A. B. Rylands, A. Woofter, and C. Hughes. Arlington: Conservation International.