

PAPER • OPEN ACCESS

## Competition among actors and challenges of production forest management in Dharmasraya, West Sumatera

To cite this article: A Mutolib *et al* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **399** 012074

View the [article online](#) for updates and enhancements.

# Competition among actors and challenges of production forest management in Dharmasraya, West Sumatera

**A Mutolib<sup>1,4</sup>, Yonariza<sup>2</sup>, A Rahmat<sup>3</sup> and H Yanfika<sup>1</sup>**

<sup>1</sup> Department of Agribusiness, Faculty of Agriculture, University of Lampung, Bandar Lampung 35145, Indonesia.

<sup>2</sup> Department of Agribusiness, Faculty of Agriculture, University of Andalas, Padang West Sumatera, 25161, Indonesia

<sup>3</sup> Department of Soil Sciences, Faculty of Agriculture, University of Lampung, Bandar Lampung 35145, Indonesia.

E-mail: amutolib24@yahoo.com

**Abstract.** Management of production forest in Production Forest Management Unit Dharmasraya (PFMU), West Sumatra Province is very complicated. That is due to the many stakeholders involved in forest management and different interests. The research location was conducted in PFMU Dharmasraya and used a qualitative research approach. Data collection was carried out from January to April 2018 using key informant interview techniques. Data analysis used interactive models through three activity lines, namely: 1) data reduction, 2) data display, and 3) conclusion/verification. This study aims to see the interaction between stakeholders and the impact of competition of stakeholders on forest conditions in PFMU Dharmasraya. Results of research identified at least four stakeholders are directly involved in forest management in PFMU Dharmasraya. PFMU Dharmasraya as representatives of Government, Local community (Adat Community), the industrial timber plantation company (HTI), and forest encroachers who bought the forest from Local community/customary authorities. There are three types of interaction in the management of PFMU Dharmasraya, including cooperation, neutral, and competition. The result of the stakeholder competition occurred in the conflicts of forest ownership. Forest ownership conflict triggers each of the stakeholders to cut and claim the forest. As a result, deforestation occurred very fast in the last 15 years in PFMU Dharmasraya

**Keywords:** Competition, Conflict, Deforestation, PFMU Dharmasraya, Stakeholder.

## 1. Introduction

Deforestation in Indonesia occurred in all forest function areas, such as production forests, protected forests, and conservation forests. Generally, deforestation in Indonesia was caused by the conversion of forest to agriculture and plantations [1,2], illegal logging [3,4], and open access to the forest [5]. Besides, forest damage is also caused by the state is not able to manage forests [6], and the limitations of forestry supervisor [7].

Forests are open access resources which is the utilization involves many parties. Generally, there are three parties involved in the utilization of forest they are government, company, and the local community. The three parties have different interests and motives in the use of forests. The government

---

<sup>4</sup> To whom any correspondence should be addressed (amutolib24@yahoo.com)



should have a motif that is consistent with the principles of environmental preservation; the company generally have the motive to gain the commercial advantage; whereas local community in around the forest has the motive to meet the consumption needs of the family and income source [8,9].

The different interests of the parties in forest management, causing conflict in the forest management, promote degradation and deforestation [10,11]. The deforestation and degradation are strongly associated with natural resource management conflicts in the scope and magnitude of increased and intensified [12,13,14], and moreover, the resolution becomes extremely difficult [15]. The conflict may explain the interest, strength, and different vulnerability of different social groups based on the concern for social justice in their usage [16].

Natural resource conflicts due to differences in the interests of many parties occurred in the Production forest management Unit (PFMU) Dharmasraya, West Sumatra Province. In PFMU Dharmasraya, at least there are more than three parties interested in the forest, including government through KPHP Dharmasraya (Kawasan Pengelolaan Hutan Produksi (KPHP) = Production Forest Management Unit (PFMU)), industrial timber plantation companies (Hutan Tanaman Industri (HTI)), and local community who claim PFMU as communal land [17,18].

As a result, third parties compete with each other for control and hold the forest land. Local communities with customary law become the most powerful and aggressive party in controlled and open forests. They do not recognize the existence of state law in forest management (state forest) and only recognizes the ulayat forest/indigenous forests. The local community then performs the customary sales, which has accelerated in the deforestation process. Currently, the local community became the most dominant and powerful party in the management of production forests in PFMU Dharmasraya. The objectives of this study are: analyze the Competition among actors and challenges of production forest management in Dharmasraya, West Sumatra

## 2. Materials and Methods

### 2.1. Time and Research Site

Data has been collected from January 2017 until March 2017, then resumed in January to April 2018. The research location is in PFMU Dharmasraya. PFMU Dharmasraya located in Koto Besar SubDistrict (Nagari/village Bonjol and Abai Siat) and Pulau Punjung Sub-District (Nagari Sikabau and Sungai Dareh), Dharmasraya District, West Sumatra Province with an area about 33,550 ha.

PFMU Dharmasraya located adjacent to the residential area, as well as easy access traversed by road and waterways. Overall PFMU Dharmasraya region is a lowland forest with a rather steep topography about 3,946 ha (11.76%), a flat area about 16,171 ha (48.20%) and the sloping topography about 13,433 ha (40.04%).

### 2.2. Data Collection and Analysis

Data collection combines several techniques such as key informant interviews, observation/transect, homestay in PFMU area, and secondary data analysis. Key Informants (KI) amounted to 35 consisting of Communal Land Ruler (2 informants), *Ninik Mamak*<sup>5</sup> (16 informants) and Nagari Leader (8 informants) in each Nagari. Moreover, 4 (four) key informants from Government agencies (Dharmasraya Forestry Service, PFMU Dharmasraya, BPN Dharmasraya), 5 (five) informants from HTI Companies (Inhutani, Dhara Silva, Incasi Raya, Selago Makmur Plantation (SMP) and Andalas Wahana Berjaya (AWB)). KI was identified using the snowball technique.

The research method uses a qualitative research approach. Afrizal states "Data analysis in qualitative research has been carried out starting from the formulation and identification of research problem, before plunging into the field, and lasts until the writing of the research results [19]. Stakeholder analysis used PIL (P=Power, I=Interest dan L=legitimate) criteria [20,21]. Data was analyzed qualitatively through

---

<sup>5</sup>Ninik Mamak is a traditional institution that consists of several penghulu who come from different people or clans that exist within the clans in Minangkabau.

data reduction, display data, and conclusions (drawing or verifying) to provide a descriptive answer to the issues [22,23].

### 3. Results And Discussion

#### 3.1. History of PFMU Dharmasraya

The establishment of PFMU Dharmasraya based on proposals of Regent Dharmasraya in accordance with the letter no 130/684/BPT/VIII-2013 date 2 Agustus 2013, and determined by decree of the Minister of Forestry of the Republic of Indonesia No. SK.695/Menhut-II/2013 date 21 Oktober 2013 about the establishment of PFMU Dharmasraya.

Historically, The PFMU Dharmasraya has several changes. In 1972, this area is a *forest* concession license (HPH/ Hak Pengusahaan Hutan) granted to PT Ragusa (PT= Company) with an area about  $\pm$  66,000 ha. After the expiration of HPH in 2002, half of HPH Ragusa granted to the three oil palm plantation company, PT Incasi Raya, PT Selago Makmur Plantation (SMP) and PT Andalas Wahana Berjaya (AWB). Remaining of HPH PT Ragusa is then given to the three permit holders, as industrial timber plantation (HTI) PT Inhutani, PT Dara Silva Lestari (DSL), and PT Bukit Raya Mudisa (BRM). The history of forest management in the FMU Dharmasraya displayed in table 1.

**Table 1.** History of Forest Management in PFMU Dharmasraya

Year	Owner	Function of Forest	Area (Ha)
1972	PT Ragusa Ltd.	HPH	66,000
2002	PT Inhutani	HTI, 15,000 ha for Meranti trees ( <i>Shorea leprosula</i> )	32,749
2002	PT Incasi Raya, PT AWB, dan PT SMP	Land Use Rights (HGU) of Oil Palm Plantation	33,251
2007	PT BRM	HTI (part of HTI Inhutani)	764
2007	PT Dhara Silva	HTI (Part of HTI Inhutani)	17,114
2013	KPHP Dharmasraya	HTI (including PT Dhara Silva, Inhutani, & BRM)	32,749

Sources: Document of RPHJP PFMU Dharmasraya and Interview with Head of PFMU Dharmasraya

Legally, as customary law forest in PFMU Dharmasraya is the *ulayat* forest of local indigenous in Dharmasraya. It is unclear how extensive this communal forest extends. According to information gained from in-depth interviews, it was claimed that the 66,000 ha of PT Ragusa land was original *ulayat* forest. Currently, only 33,550 ha of Melayu *ulayat* forest remains in PFMU Dharmasraya [24]. At this present time, the entire forest of PFMU Dharmasraya is claimed to be a *ulayat* forest of Indigenous people in Dharmasraya. According to custom, this forest is an asset to be used for the welfare of the entire community hence a member [24]. The local community only recognizes forests as communal land and does not recognize the state law and state forest.

#### 3.2. Stakeholders Interest Mapping

There are many stakeholders involved in PFMU management. Each stakeholder has different interests. The result is often conflict due to the differences of interest in PFMU Dharmasraya.

**3.2.1. Stakeholders involved in PFMU Management.** The results were obtained information related to the stakeholders involved and have an interest in forest management in PFMU. There are at least eight stakeholders identified as parties which interested in forest management in PFMU. There are five parties directly involved in forest management and clearing which include PFMU Dharmasraya, local communities, Community ruler, forest encroachers, and HTI Companies). Whereas 3 (three) parties were not directly involved in forest management in PFMU Dharmasraya which included: BPKH 1 Medan, Dharmasraya Forestry Service, and National Land Agency of Dharmasraya. Stakeholders involved in PFMU Management displayed in table 2.

**Table 2.** Stakeholder involved in PFMU Management

No	Stakeholder	Involvement	
		Direct	Indirect
1	PFMU Dharmasraya	√	
2	Local Community	√	
3	Penguasa Ulayat (Communal ruler)	√	
4	Forest encroachers (Non local community)	√	
5	HTI Companies	√	
6	BPKH I Medan <sup>6</sup>		√
7	Dharmasraya Forestry Service		√
8	National Land Agency of Dharmasraya District		√

Source: Interview data, 2018

**3.2.2. Stakeholder Analysis.** Of the eight stakeholders identified through PIL criteria, only PFMU Dharmasraya categorized PIL (Dominant). Local community and *Penguasa Ulayat* (Communal land ruler) categorized as PI (forcefull). PFMU Dharmasraya categorized as PILL because in this analysis use the state law. When using the customary law or local law, the local communities and Communal ruler become the most dominant parties in forest management in PFMU, stronger than PFMU Dharmasraya. Fact, the law used in forest management is customary law, indigenous community, and Communal ruler is very dominant in forest management in PFMU than HTI Companies and PFMU Dharmasraya agency. Stakeholders analysis with PIL criteria in PFMU Dharmasraya displayed in table 3.

**Table 3.** Stakeholders analysis with PIL criteria in PFMU Dharmasraya

No	Stakeholders	Power		Interest		Legitimacy		Category
		S	W	S	W	S	W	
1	PFMU Dharmasraya	√		√		√		PIL (Dominant)
2	Local Community	√		√			√	PI (Forcefull)
3	Penguasa Ulayat (Communal ruler)	√		√			√	PI (Forcefull)
4	Forest encroachers (Non-local community)		√	√		√		IL (Susceptible)
5	HTI Companies		√	√		√		IL (Susceptible)
6	BPKH I Medan		√	√		√		IL (Susceptible)
7	Dharmasraya Forestry Service	√			√		√	P (Dormant)
8	National Land Agency of Dharmasraya District		√		√		√	-

Note: S (Strong), W (Weak)

**3.2.3. Main Stakeholders in Management of PFMU Dharmasraya.** Although many stakeholders involved in forest management in the FMU Dharmasraya, only a few stakeholders were really involved and activities are in the PFMU area. Four stakeholders, such as the PFMU Dharmasraya as an operator in forest management. PFMU representative of the government. Also, HTI Companies (DS and Inhutani), local community (including Communal ruler) who claim forests as communal land, and forest encroachers who acquired the rights to open and cut the forest from Communal ruler. Stakeholders Claims to the PFMU Dharmasraya displayed in table 4.

<sup>6</sup> BPKH is *Forest Area Gazettement Service* a technical unit under the Directorate General of Forestry Planology, Ministry of Forestry of Indonesia. This institution has the task of carrying out the stabilization of forest area, assessing change in status and functions of forests, as well as provide data and information on forest resources.

**Table 4.** Stakeholders Claims to the PFMU Dharmasraya

No	Stakeholders	Claim to the forest
1	Government/PFMU Dharmasraya	Forests as a State-owned and administered PFMU Dharmasraya. Ministry of Forestry Republic of Indonesia Decree No. SK.695/Menhut-II/2013 21 Oktober 2013
2	HTI Company	<i>IUPHHK</i> (forest timber product exploitation permits) with Minister of Forestry of Republic Indonesia decree No.621/KptsII/2009 5 October 2009 for PT DSL with the area of 15,357 ha, and PT Inhutani 13,721.68 ha.
3	Local community/Communal ruler <sup>7</sup>	Forest in PFMU as <i>Tanah Ulayat</i> /communal land owned by the local community. This is in accordance with the Adat of Minangkabau, West Sumatra Provinsi who knows the communal land system owned by the joint owner <sup>8</sup> .
4	Forest encroachers	Forest encroachers got and opened the forest in PFMU Dharmaraya after purchase from Communal Ruler

Encroachment on the PFMU was divided into two kinds of squatters who came from local communities and non-locals. Local communities with fraternal relations, neighbors or marriage may open forests in PFMU only with the permission of communal authorities. Whereas non-local communities should buy the land from Communal ruler to open the forest. Basically, forest encroachers have not related to the government and HTI companies, they are directly related to the communal authorities that ensure forest clearing in the PFMU area. If there is interference from governments and companies against encroachers, then Communal ruler will be responsible and ensure the safety of forest encroachers. Interesting in the case of forest management at the PFMU Dharmasraya is, Communal ruler has a higher position than the government (PFMU) and the license holder (HTI Companies). That is due to local community recognition of the customary law in forest ownership is higher than the state law.

### 3.3. Stakeholders Interaction in PFMU Dharmasraya

Fourth stakeholders involved in forest management in the FMU have a different purpose that ultimately led to the interest conflict between the parties. Each party was competing to gain the benefits. Besides, there are several stakeholder's collaborations to get the benefit. For example, cooperation between local communities (communal authorities) and forest encroachers in forest selling. Interactions between stakeholders in PFMU Dharmasraya displayed in table 5. From table 5, it can be concluded that the stakeholder's interaction in the management of PFMU divided into three kinds, namely 1) competition, 2) cooperation, and 3) neutral. Stakeholders Interaction in PFMU Dharmasraya displayed in table 5.

**Table 5.** Stakeholders Interaction in PFMU Dharmasraya

No	Stakeholders	Interaction
1	Local Community vs Government (PFMU)	Competition
2	Local Community vs Company HTI	Competition
3	Local Community vs Forest encroachers	Cooperation
4	Company HTI vs Government (PFMU)	Neutral
5	Company HTI vs Forest encroachers	Competition
6	Perambah VS Government (PMFU)	Competition

<sup>7</sup>*Ulayat* was passed on to generations and be entitled to women, but the rights holer of *ulayat* was *Mamak Kepala Waris/Penguasa Ulayat* (Navis, 1986) [25].

<sup>8</sup> Adat in the most general sense means "the way of life". It is sometimes translated with "customs" (von Benda Beckman *et al.* 2006) [26], adat comprises law, morals, customs and conceptions. On the four categories of Minangkabau adat and the extensive adat philosophy see Rajo Panghulu (1978) [27] and Franz and Keebet Benda-Beckmann (2004) [28].

*3.3.1. Cooperative.* Stakeholder's cooperation occurs between Local community stakeholders/Communal rulers and forest encroachers who are not local communities. Cooperation occurs because of the same interests and mutually beneficial relationships. In customary law, forest in PFMU is Communal land owned by the local community (controlled by several Communal rulers) in Nagari, Abai Siat, Sungai Dareh, and Sikabau. There are about six Communal rulers who controlled communal land in PFMU. Every Communal ruler has different of communal land size, between 500 ha and 15,000 ha

Cooperation between the Local community (Communal Ruler) and Forest encroachers/buyer occurs because the Communal Ruler sell communal land to the Forest encroachers to obtain money, and the Forest encroachers need forests land to made plantations. Buyers come from almost all regencies/cities in West Sumatra, even coming from outside of West Sumatra. The communal land price of about Rp. 2,500,000 to 10,000,000 depends on the distance to human settlements and slope [24]. Communal land buyers have different employment backgrounds such as entrepreneurs, bank employees, private employees, pensioners, civil servants (police, military, civil officials). They know that the open a plantations in forest area are breaking the law, but the trade of forest still occur. The guarantees are given by the Communal Land Ruler, causing the buyers not to worry about state law.

*3.3.2. Competitive.* Competition in the management of PFMU occurs because each party claims the forest with different laws. Local communities (Communal Ruler) and encroachers using customary law in forest ownership in PFMU. While PFMU party served claimed forest in PFMU as state forests with a state law that its existence must be protected.

Due to differences in the laws are used, there is the competition in forest tenure. Local communities (Communal Ruler) and Forest encroachers/Buyers clearing the forest using the traditional law. Forests that have been opened means has been owned by the local community/buyer so that governments or the company is not entitled to the forest. If the companies and governments want to take the forest, they should reimburse Rp. 10,000,000 and Rp. 10,000,000 ha<sup>-1</sup>

*3.3.3. Neutral Interaction.* The relationship between the company and PFMU Dharmasraya is the neutral interaction. That occurs because the license holder (DSL and Inhutani) has left the forest because it has encroached. Forest management permits have been sold to PT SMP. While the PFMU Dharmasraya served as an operator in forest management to ensure forests are managed by following the functions that have been set by the Government / Ministry of Forestry of Republic Indonesia [29]

#### *3.4. Local communities become the most powerful in PMFU Dharmasraya*

The recognition of customary law in the Dharmasraya powerful lead position of local communities in forest authorities in PFMU Dharmasraya be very dominant. People understand PFMU Dharmasraya PFMU as state forests, but people put traditional law (Hukum adat in Minangkabau society) higher than state law. The community from Dharmasraya, officials, and police and other parties understand that legally forest in PFMU Dharmasraya an *adat forest* (communal land), which is owned by local communities. Thus, the sales and cutting of the forest in PFMU Dharmasraya considered reasonable if it has obtained permission from the Communal Land Ruler and it is not unlawful. As a result, the position of the local community (Communal land ruler) in forest management in PFMU Dharmasraya higher than PFMU Dharmasraya and the Company obtained permission from the State/Government.

#### *3.5. Stakeholders Competition and Deforestation*

Generally, there are two parties in the competition in PFMU Dharmasraya management, the parties that recognize the forests as communal land (Local communities and Forest encroachers) and parties that recognize forests as state forests (HTI companies and PFMU administrator). That has led to competition in forest tenure, which in turn triggers the forest destruction in the PFMU Dharmasraya.

Local communities (Communal land ruler) worried if the HTI companies or the Government/PFMU administrator took the forest. As anticipate that the forests are not taken by the HTI company and the

PFMU administrator, they (local communities and forest encroachers) cleared and planted the forest with rubber and oil palm. Clearing the forest means that the local communities/forest encroachers have owned the forest.

The result of forest ownership competition, forest clearing and deforestation in PFMU Dharmasraya very quickly. Satellite image analysis in 2015 showed that the forest in PFMU Dharmasraya remaining 18.89% of the total area of 33,550 ha. Whereas in 2000 the forest covers in PFMU Dharmasraya about 86.35% of the total area. The plantation area has increased in the last 15 years. In 2000 the plantation area approximately 10,24% of the total PFMU area, then in 2015 plantation area in PFMU increased by about 71.23%

#### 4. Conclusion

There are four main stakeholders in forest management in the FMU Dharmasraya (Local community, PFMU Dharmasraya [Government], Forest encroachers, and HTI Companies). The interaction that occurs among stakeholders such as competition, cooperation and neutral. Competition among stakeholders is due to different interests and the law in forest ownership in PFMU Dharmasraya.

Local community and Forest encroachers used the adat law in forest ownership, and the PFMU Dharmasraya and HTI Companies used state law in forest ownership in the PFMU. The differences of law in PFMU management caused competition and conflict in PFMU.

The reality, local communities become the most dominant in the forest tenure in PFMU Dharmasraya. That caused almost all parties to admit the customary law in forest ownership in PFMU. Competition among stakeholders in PFMU Dharmasraya has caused rapid deforestation. In 2015, forests in FMU Dharmasraya remaining 18.89% of 33,550 ha, whereas in 2000, 86.35% of PMFU Dharmasraya is the secondary forest.

*Recommendations:* In fact, the forest in PFMU Dharmasraya has been controlled by many parties with claims of being a customary forest. It is very risky if the government adopts repressive policies in forest management. The government should adopt a community-based forest management approach in managing forests in the PFMU Dharmasraya. Communities are permitted to manage forests and they must preserve the forest and other ecological aspects in accordance with the social forestry policy. Collaboration is the last option that can be taken to avoid conflicts in forest management and preserve the forest.

#### 5. References

- [1] Kobayashi S 2004 Landscape rehabilitation of degraded tropical forest ecosystems Case study of the CIFOR/Japan project in Indonesia and Peru *Forest Ecology and Management* **201** 13–22.
- [2] Ting Z, Haiyun C, Shivakoti G P, Cochard R and Homcha-Aim K 2010 Revisit to community forest in the northeast of Thailand: changes in status and utilization. *Environment Development and Sustainability* **13(2)** 385-402.
- [3] Sylvian 2008 Study on the Impact of Changes in the Forest Function to the Community Around the Forest *Jurnal Penelitian Sosial dan Ekonomi Kehutanan* **5(3)** 155-178.
- [4] Subarna T 2011 Study on Influenced of Community to Cultivate Land of Protected Forest: Case Studies in Garut Regency of West Java *Jurnal Penelitian Sosial dan Ekonomi Kehutanan* **8(4)** 265–275.
- [5] Zuhriana 2012 Zuhriana, D. 2012. Pengembangan Sosial Ekonomi Masyarakat Daerah Penyangga Taman Nasional Gunung Ciremai. Disertasi. Sekolah Pascasarjana IPB, Bogor.
- [6] Elvida Y S dan Alviya I 2009 Implementasi dan strategi pembangunan Kesatuan pengelolaan hutan banjar (Implementation and Strategy of Banjar Forest Mangement Unit Development). *Jurnal Analisis Kebijakan Kehutanan* April 2009 **6(1)** 57 – 70.
- [7] Effendi R, Bangsawan I and Zahrul M M 2007 “Study of Community Empowerment Model Around the Production Forest Areas for Preventing Illegal Logging” *Jurnal Penelitian Sosial dan Ekonomi Kehutanan* **4(4)** 321-340.



- [8] Tadjudin D J 2000 *Manajemen Kolaborasi* (Bogor: Pustaka Latin).
- [9] Wunder S, Angelsen A and Belcher B. 2014 Forests, Livelihoods, and Conservation: Broadening the Empirical Base. *World Development* **64** (1) S1-S11.
- [10] Duguma LA, Atela, Joanes, Minang PA, Ayana AN, Gizachew B, Nzyoka JM and Bernard F 2019 Deforestation and Forest Degradation as an Environmental Behavior: Unpacking Realities Shaping Community Actions. *Land* **8**(28) 1-17.
- [11] Muttaqin MZ, Alviya I, Lugina M, Almuhayat F, Hamdani U and Indartik, I 2019 Developing community-based forest ecosystem service management to reduce emissions from deforestation and forest degradation *Forest Policy and Economics* **108**, <https://doi.org/10.1016/j.forpol.2019.05.024>. (Article in press).
- [12] Escobar A 1998 Whose Knowledge, Whose nature? Biodiversity, Conservation, and the Political Ecology of Social Movements *Journal of Political Ecology* **5**(1998) 53-82.
- [13] Matsvange D, Sagonda R and Kaundikiza, M 2016 The role of communities in sustainable land and forest management: The case of Nyanga, Zvimba and Guruve districts of Zimbabwe. *Jambá: Journal of Disaster Risk Studies* **8**(3) a281. <http://dx.doi.org/10.4102/jamba.v8i3.281>
- [14] Bob U and Bronkhorst S 2010 Environmental conflicts: Key issues and management implications *African Journal of Conflict Resolution* **10**(2) 9-30.
- [15] Gritten D, Saastamoinen O and Sajama S 2009 Ethical Analysis: A Structured Approach to Facilitate the Resolution of Forest Conflicts *Forest Policy and Economics* **11**(8) 555–560.
- [16] Turner M D 2004 Climate Change and Social Resilience: “Adaptive” Conflict in the Sahel. The University of Wisconsin-Madison *Paper prepared for the Berkeley Environmental Politics Workshop*. Downloaded: [http://globetrotter.berkeley.edu/bwep/colloquium/papers/Turner\\_ClimateChangeAndSocialResilience.pdf](http://globetrotter.berkeley.edu/bwep/colloquium/papers/Turner_ClimateChangeAndSocialResilience.pdf)
- [17] 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.
- [18] 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) 163–171.
- [19] Afrizal 2015 *Metode Penelitian Kualitatif: Sebuah Upaya Mendukung Penggunaan Penelitian Kualitatif Dalam Berbagai Disiplin Ilmu* (in Indonesia) (Jakarta: Raja Grafindo Persada).
- [20] Grimble R and Wellard K 1997 Stakeholder Methodologies in Natural Resource Management: A review of concepts, contexts, experiences and opportunities *Agricultural Systems* **55** 173-193.
- [21] Soetoyo, Maryunani, Soemarno and Laoh O E H 2013 Governance the Utilization of Protected Forest of Sungai Wain (HLSW) With a Pattern of Incentives and Disincentives in Balikpapan City. *IOSR Journal Of Environmental Science, Toxicology And Food Technology* **5**(1) 01-07.
- [22] Moleong L J 2008 *Metodologi Penelitian Kualitatif* (in Indonesia) (Bandung: PT Remaja Rosdakarya)
- [23] Miles M B and Huberman A M 1994 *Qualitative Data Analysis: A Sourcebook of New Methods* (California, United States: SAGE Publications, Inc).
- [24] Mutolib A, Yonariza, Ismono H and Mahdi 2015 Konflik agraria dan pelepasan tanah ulayat (Studi kasus pada masyarakat Suku Melayu di Kesatuan Pemangkuan hutan Dharmasraya, Sumatera Barat) (in Indonesia) *Jurnal Penelitian Sosial dan Ekonomi Kehutanan* **12**(3) 213–225.
- [25] Navis A A 1986 *Alam Takambang Jadi Guru, Adat dan Kebudayaan Minangkabau* (in Indonesia) (Jakarta: Pustaka Grafitipers)
- [26] Von Benda-Beckmann F, Von Benda-Beckmann K and Wiber M G 2006 *Changing Properties of Property*. (New York: Berghahn Books).
- [27] Rajo Panghulu I H D 1978 *Buku Pegangan Penghulu di Minangkabau*. (Bandung: Rosda).

- [28] Franz, Von Benda-Beckmann F and Keebet, Von Benda-Beckmann K 2004 *Struggles Over Communal Property Rights and Law in Minangkabau, West Sumatra*. Working Paper No. 64. Max Planck Institute for Social Anthropology.
- [29] Ministry of Forestry of Republic Indonesia 2011 "*Pembangunan Kesatuan Pengelolaan Hutan: Konsep, Peraturan Perundangan dan Implementasi*". Jakarta: Direktorat Jenderal Planologi Kehutanan dan Direktorat Wilayah Pengelolaan dan Penyiapan Areal Pemanfaatan Kawasan Hutan.