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REGULAR RESEARCH ARTICLE

Reverse Social Impact of Oil Palm Plantation Expansion: A Study of Three Communities in Jambi, Indonesia

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ABSTRACT

Studies on the social impacts of oil palm development have focused on various communities with distinct characteristics. Due to the rarity of comparative investigations, this study aimed to examine the impact of oil palm plantation expansion on the *Suku Anak Dalam*, Jambi Malay, and the Javanese transmigrant, the three communities with different socio-economic characteristics. In-depth interviews and observations were conducted to understand the communities' interaction and dependence on forest resources. The study also conducted a household census to assess 67 Malay and 66 Javanese transmigrant families. However, a household census could not be conducted to asses 45 families of the *Suku Anak Dalam* due to some limitations. This necessitated indirect data collection through the community leader. The results showed that the oil palm development significantly and negatively impacts the *Suku Anak Dalam* more than the Malay community and the Javanese transmigrant. The *Suku Anak Dalam* face difficulties in meeting their basic needs because the conversion of forest areas into oil palm plantations has reduced their access to these resources. In contrast, the Malay community and the Javanese transmigrants have enjoyed various benefits, such as ownership of oil palm gardens, employment opportunities as daily laborers, and partnerships with companies through the nucleus-plasma program. Therefore, it is crucial for the government to protect the *Suku Anak Dalam* community from the negative impacts of oil palm plantation development activities.

KEYWORDS

Reverse social impact; Oil palm plantation; Indigenous people; *Suku Anak Dalam;* Transmigration; Jambi Malay.

1. INTRODUCTION

Scholars have debated various topics related to oil palm plantation development (Andrianto et al., 2019; Ayompe et al., 2021; Edwards, 2019; Elmhirst et al., 2017; Leijten et al., 2020; Runtuboi et al., 2021). Some studies have also discussed the economic benefits (Ayompe et al., 2021; Edwards, 2019; Vermeulen & Goad, 2006; Yusoff, 2006). However, these expansions have caused many detrimental ecological impacts, such as rainforest destruction and climate change (Ayompe et al., 2021; Oosterveer, 2015), and a loss of 48-60% of bird species and habitats (Azhar et al., 2011; Teoh, 2010). Other negative impacts are changes in natural structure, forest fragmentation, soil erosion, as well as changes in hydrology, rainfall, and the environment (de Carvalho et al., 2015; Obidzinski et al., 2012; Saswattecha et al., 2015; Szulczyk & Khan, 2018). Moreover, the development destroys the soil's natural structure and morphology through decomposition, compaction, and sedimentation. The use of pesticides, herbicides, fungicides, and insecticides contaminates water and river habitats (Jiwan, 2013). In Thailand, this becomes a discussion topic among scholars believing that plantation development has caused increased greenhouse gas emissions, oxidation, and eutrophication processes, the formation of photochemical

ozone, human toxicity, and freshwater ecotoxicity (Saswattecha et al., 2015, 2016; Silalertruksa et al., 2017). Furthermore, expansion has caused social impacts, such as the loss of job opportunities and possibilities to gain livelihoods for local communities (Elmhirst et al., 2017; Oosterveer, 2015; Santika et al., 2019). Some studies also reported disharmonic relations between communities and oil palm plantation managers (Li, 2018; Manik et al., 2013). There have also been social conflicts and other tenure issues (Abram et al., 2017; M Colchester, 2010; Marcus Colchester et al., 2007) in the indigenous communities of Auyu, Mandobo, Marind, Papuans, and the Dayak tribes in West Kalimantan (Andrianto et al., 2019; Obidzinski et al., 2012; Runtuboi et al., 2021).

Studies have only investigated the impacts of oil palm expansion on various communities with certain social characteristics without comparative analyses. For instance, Andrianto et al. (2019), Chao (2021), Runtuboi et al. (2021), and Van Der Muur (2018) only examined the social impacts of oil palm plantations on indigenous peoples in Central and Eastern Indonesia, particularly Papua and South Sulawesi. Colchester (2007), Colchester et al. (2010), Nilakrisna et al. (2016), Prasetijo (2017), Sager (2008), Steinebach (2013), Rahayu et al. (2021), and Sirait (2009) were conducted in Sumatra and West Kalimantan and found similar results. Additionally, Huesca (2016), Pichler (2013), Colchester et al. (2010), Kadiri (2021), and Damiani et al. (2020) conducted related studies in Brazil, Nigeria, and Southeast Asia.

Very few studies have examined and compared the impact of oil palm plantation expansion on communities with different social characteristics, such as indigenous and non-indigenous people. Therefore, this study analyzed the social impact of the oil palm plantation expansion on community groups with different social characteristics. The communities examined include indigenous and non-indigenous people assuming that the impacts received by each group are different and reversed. The study was conducted in Jambi Province, Sumatra-Indonesia, an area that has experienced a significant increase in oil palm plantations in the last decades. The development has the potential to cause positive and negative impacts on communities with different social characteristics.

2. METHODS

This study was conducted on indigenous people of the *Suku Anak Dalam*, non-indigenous Jambi Malay, and Javanese transmigrants, three communities with different social characteristics. The *Suku Anak Dalam* lived in the Kejasung forest area of Batu Sawar Village, the Jambi Malay community was based in Sungai Lingkar village, while the Javanese transmigrant lived in Mekar Sari and Rawa Mekar villages. The three villages are part of the Maro Sebo Ulu Sub-District, Batang Hari Regency, located in or close to the Bukit Duabelas National Park landscape, as shown in Figure 1.

The study was held from August to November 2020 and collected data using in-depth interviews and observation techniques. Data collection aimed to explore the linkages of each community with the surrounding natural environment and the oil palm plantation development. In-depth interviews with the *Suku Anak Dalam* were conducted with informants such as *Temenggung* (the head of the tribe) and *Jenang*, a symbol of customary law and the highest leader. Informants from the Malay and Javanese transmigrant communities were village and oil palm cooperative heads, community leaders, Village Consultative Council (*Badan Permusyarawatan Desa*), and community members.

The qualitative method was supported by a quantitative assessment to identify the socioeconomic status of each family and their involvement in oil palm plantation development. The household census was conducted to assess 67 Malay and 66

Javanese transmigrant families. However, the study could not conduct a household census to asses 45 families of the *Suku Anak Dalam* due to certain limitations. Most *Suku Anak Dalam* families refused to be interviewed during the Covid-19 pandemic due to fear of infections by outsiders. Some families were moving to new settlement areas in the forest because their members had died (*melangun* tradition). Therefore, the quantitative relevant data of the 45 families of the *Suku Anak Dalam* community were collected indirectly through their community leaders (*Temenggung* and *Jenang*).

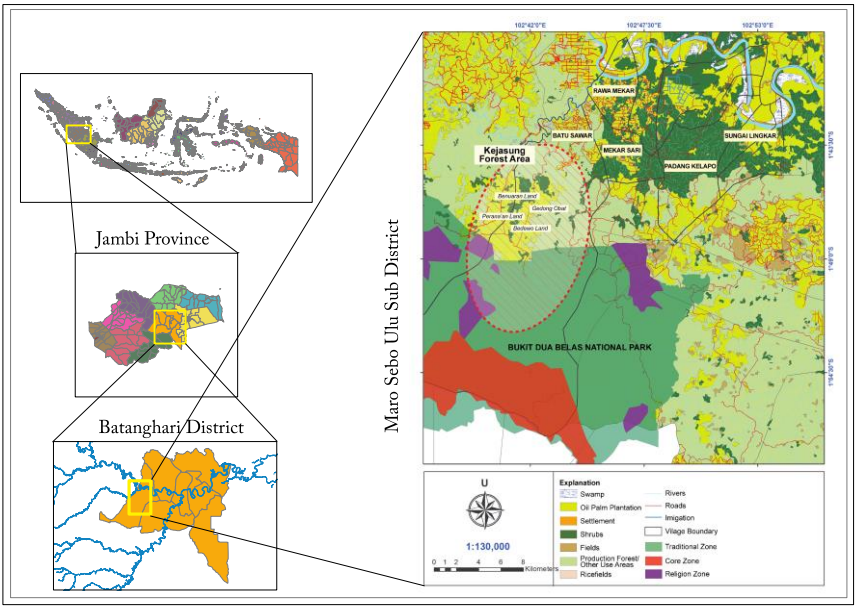

Figure 1. Study sites

3. OVERVIEW OF OIL PALM PLANTATION DEVELOPMENT IN JAMBI PROVINCE

The oil palm development in the Southeast Asian region has increased and has contributed to the economies of Malaysia and Indonesia (Purnomo et al., 2020). In 2021, Indonesia had oil palm plantations covering 14,663,416 ha. The majority of the 8,001,239 ha are owned by private companies, 6,088,703 ha is community-owned, while the government owns only 573,474 ha (Direktorat Jenderal Perkebunan, 2021). The expansion has contributed to a narrowing of primary and secondary forests, as well as abandoned lands (Margono et al., 2012, 2014).

Jambi Province is one of the regions in Indonesia experiencing a rapid expansion of oil palm plantations. Figure 2 shows that the province had 1,083,930 ha of oil palm plantation in 2021, increasing from around 600,000ha in 2011 (Direktorat Jenderal Perkebunan, 2021). Oil palm plantations have expanded in production and other forest areas with Other Use Area status (*Areal Penggunaan Lain*), especially in damaged or abandoned regions. The community, private companies, and the state own 771,997 ha, 291,342 ha, and about 20,591 ha of the plantations.

Oil palm plantation development in Jambi is inseparable from the National Private Large Development credit and the Transmigration plasma-nucleus partnership programs in 1977-1990. Plasma-nucleus partnership program exists between business partners and the company as plasma and the core, respectively. The national government initiated these programs involving cooperation between the State

Plantation Company (*Perseroan Terbatas Perkebunan Negara* VI) and a private company called PT. Indo Sawit Subur Company (Asian Agri Group). The plasma-nucleus partnership pattern has developed in the last decades, with at least 78 companies working with local residents (Dinas Perkebunan Provinsi Jambi, 2020). Farmers have also begun managing their oil palm gardens independently as smallholders.

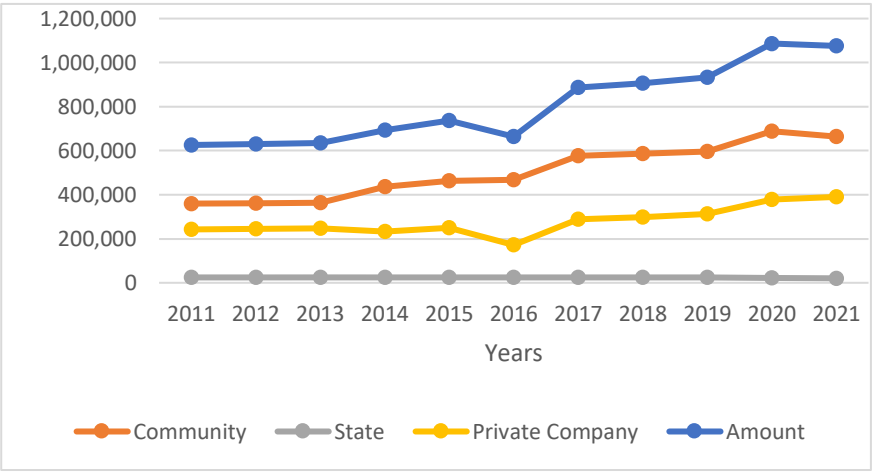

Figure 2. Oil palm plantation development in Jambi Province
[Source: Dinas Perkebunan Provinsi Jambi, 2020]

In Batang Hari Regency, 30 oil palm companies are involved in the plasma-nucleus partnership program. Five of these companies operate in the Maro Sebo Ulu subdistrict, where around 9,583 ha of oil palm gardens belong to the local community. These palm gardens are managed by the companies under the plasma-nucleus partnership scheme (Dinas Perkebunan Provinsi Jambi, 2020; Desmaryani et al., 2018). Many local people, the Jambi Malay, and the Javanese transmigrants independently engage in the oil palm business, owning and managing Around 11,454 ha oil palm (Dinas Perkebunan Provinsi Jambi, 2020).

4. RESULTS AND DISCUSSION

4.1 The Community and involvement in Oil Palm Plantation

The study area has at least three communities with different cultural and socioeconomic backgrounds, including the *Suku Anak Dalam*, the Jambi Malay, and the Javanese transmigrant. The *Suku Anak Dalam* live nomadically in the Kejasung Forest area of Batu Sawar Village. A part of the community has moved to Padang Kelapo Village to join the government resettlement program, while about 45 families still live in the Kejasung forest area. The Jambi Malay reside in Sungai Lingkar Village, while the Javanese transmigrant is in Mekarsari and Rawa Mekar Villages, as shown in Figure 1.

The oil palm plantation expansion in the geographical areas of the three communities began in 2010. The process started in the Javanese transmigration area and continued to the *Suku Anak Dalam* and Jambi Malay communities in 2014. The Jambi Malay and Javanese have been managing the plantation independently or in partnership with companies. The people also worked as daily laborers in plantation companies. In comparison, the *Suku Anak Dalam* seems to have benefited less since the development. The details are presented in Table 1.

Table 1. Communities' population, livelihoods, and involvement in oil palm plantation

Community	Population	Livelihoods	Incorporation to Oil Palm Activities
Suku Anak Dalam	Nomadic group. 45 families living in the Kejasung forest area (Batu Sawar village)	Relied on the forest for living through hunting and gathering, foraging, and shifting cultivation. Began relying on oil palm plantations for living	Limited incorporation in oil palm development.
Jambi Malay	67 families living in a sub-village of Sungai Lingkar Village, Maro Sebo Ulu Sub-District (non-indigenous people), in an area close to oil palm plantations.	Previously depended on agricultural activities, including ricefields, upland agriculture (*Umo renah or Umo talang)*, and agroforestry (*Perelak*). collected forest products, fuelwood, and timber for house construction items, engaged in oil palm plantation activities independently or in partnership with oil palm plantation companies, and worked as daily laborers for oil palm plantation companies.	Involved in oil palm plantation activities since 2014. 22 families (33%) partnered with an oil palm company through the Plasma-Nucleus partnership program. 14 families (21%) independently manage their own-oil palm gardens, 9 families (13%) worked as daily laborers in oil palm plantation companies.
Javanese Transmigrant	31 and 35 families living in sub-villages of Mekar Sari and Rawa Mekar Transmigration villages; coming from different places in Java, migrated to the transmigration area in Jambi Province in 2005.	Previously, depended on agricultural activities, including upland ricefields, vegetables, and secondary crops cultivation, collected forest products, fuelwood, and timber for house construction, independently engaged in oil palm plantation activities, worked as daily laborers for oil palm plantation companies.	Involved in oil palm plantation activities since 2010, 56 families (85%) independently manage their own-oil palm gardens, 11 families (17%) of the community worked as daily laborers in oil palm plantation companies

The *Suku Anak Dalam* has a nomadic lifestyle with a livelihood and socio-economic system depending on products obtained from the forest through foraging. The community is also engaged in hunting and gathering. Regarding this, Sager (2008, 2017) and David et al. (2015) stated that hunting and gathering is a process of adaptation to nature. This forms a hereditary culture and a sustainable socio-economic system where most of the required items are naturally available in the forest.

Living in the forest, the *Suku Anak Dalam* community collects durian (*Durio zibethinus*), *bedaro/longan* (*Dimocarpus longan*), *tampui* (*Baccaurea macrocarpa*),

forest *rambutan* (*Nephellium lappacium*), *cempedak (Arthocarpus champeden)* and *sialang* honey (*Apis dorsata*). The community also hunts for mouse deer *(Tragulus javanicus*), deer (C*ervus timorensis* and *Muntiakus muntjak*), napu *(Tragulus napu), pangolin (M. Javanica),* wild boar *(Sus scrofa vittatus)*, porcupine (*Hystrix brachyura*), and *Kuau (Argusisnus argus)*.

Forest is the main source of livelihood and the identity of the *Suku Anak Dalam*. It is fundamental to the formation of customs, rituals, religion, and politics (Prasetijo, 2017; Sager, 2008). The community's knowledge is inseparable from its origin as hunter-gatherers, a lifestyle inherited from their ancestors. Many trees have different cultural meanings and functions for this community. For instance, the *Sentubung* tree (*Drypetes Polyneura*) is used to plant the newborn's placenta and determine the baby's health. According to their belief, the damage or death of such a tree signifies the baby's illness or death. The community also believes that other creatures or spirits live in the forest, such as *Badewo* (Najib, 2020).

The study identified 45 families of the *Suku Anak Dalam* living in the Kejasung forest area. The families were grouped in a community called *ketemenggungan*, led by Jelitai or *Temenggung* Jelitai. The community was also called *Ketemenggungan Jelitai,* previously comprising 71 families. In 2014, 55 families followed the resettlement program implemented by the Jambi Provincial government in Padang Kelapo village, as illustrated in Figure 1. However, 19 families refused to participate in the resettlement program. The families wanted to live in the forest and continue their tradition as a nomadic community. In 2015-2016, 26 resettled families left the resettlement area and returned to the forest. The community did not feel comfortable living in the resettlement area and wanted to join those that refused the program.

In 2014, a part of the forest in the Kejasung forest area was converted to an oil palm plantation. The conversion was carried out by an oil palm company permitted by the government. The permit was issued because the forest area was considered to belong to the state, as stipulated in Law no. 5 of 1967 (UU No. 5 Tahun 1967). This law classified such forest areas as production to fulfill social interests as well as development, industrial, and export needs. Though the *Suku Anak Dalam* has been living in such forest areas for generations, they were considered nonexistent and received no significant compensation.

The Jambi Malay community relies on agricultural land such as ricefields, upland fields (*Umo renah or Umo talang*) for planting upland rice and secondary crops, and agroforestry (*Perelak*) to cultivate rubber, fruit, and timber trees. The community also utilizes forest products, such as rattan and resin or timber for construction and fuel wood. These traditional farming systems indicate a fairly close relationship with the forest.

A part of the Jambi Malay community in Sungai Lingkar village started engaging in an oil palm plantation in 2014. The local community was offered to partner with companies to develop oil palm plantations through the nucleus-plasma partnership program. Subsequently, the community handed over their lands to be managed by the company without compensation for trees growing on it provided the participating farmers were certified as owners. The community became the plasma of the company which played a role as the nucleus in a partnership valid for 35 years. The company pledged that the certificate was collateral to the bank with the farmers' approval to obtain capital for land clearing, planting, maintenance, and other operational costs. Under this plasma-nucleus system, the community would get a 50% share of the profit. The study found that 33% or 22 of the 67 sample families in the Jambi Malay community engaged in this system.

Other families were attracted to convert their dry agricultural lands to oil palm gardens and manage them independently. During the study, 14 other families were owning and managed oil palm gardens independently. Oil palm plantation development in the surrounding area also created opportunities for local people to work in companies as daily laborers. In this regard, 9 families worked as daily laborers in an oil palm company.

The Javanese transmigrants began to settle in the transmigration sites in 2005, with 31 families in Mekar Sari and 35 in Rawa Mekar village. This community participated in the program to improve their living standards due to the scarcity of land and job opportunities in Java. The participation was also motivated by the success of previous transmigrants. The community joined the transmigration program with oil palm farming as the main source of livelihood. However, the plantation development program did not proceed as planned. Between 2005 and 2010, the Javanese transmigrants subsisted on upland agriculture and secondary crop farming activities, collecting forest resources, or working as farm laborers.

In 2010, the Javanese transmigrant community started pioneering and clearing land to plant oil palms independently. Some families later obtained financial assistance from the government to plant oil palm.

In the first two-year of cultivation, the community planted vegetables such as long beans, kale, spinach, corn, cassava, and yams in between oil palm tree rows. By 2021, 85% of the Javanese transmigrant community studied owned oil palm gardens. Around 17% of the community worked as daily laborers in oil palm companies. Despite their engagement in oil palm development, the transmigrant community still depends partly on the forest for household needs. The study found that 30% of the families continued collecting fuelwood and 17% gathered timber for house construction.

4.2 Advantages and disadvantages of Oil Palm Development for the Three Communities

The development of oil palm plantations around the study area resulted in different impacts on the three communities. The Javanese transmigrant has optimized the opportunity compared to other communities, or at least similar to the Jambi Malay community. In reverse, the *Suku Anak Dalam* appears to have benefited less from the oil palm plantation development. The details are presented in Table 2.

Table 2. Impacts of oil palm development on three communities

Community	Advantages of oil palm development	Disadvantages of oil palm development
Javanese transmigrant	New sources of income from oil palm gardens, as owners or laborers. Optimizing income derived from limited agricultural land. Increased economic welfare.	Land grabbing by the company. The theft of palm fruit bunches, allegedly carried out by members of the Jambi Malay community, reduced harvest yields
Jambi Malay	New sources of income from oil palm plantations/gardens, as owners, shareholders, and laborers. Increased economic welfare	Conversion of rubber gardens or agroforestry to oil palm plantation. More people were selling their land to companies. Traditional land management knowledge and practices were disappearing.
Suku Anak Dalam	The majority of the community member did not	Losing a source of livelihood in the forest.

Community	Advantages of oil palm development	Disadvantages of oil palm development
	own oil palm gardens. Only *Temenggun*g who have an oil palm garden in Padang Kelapo village. Collecting fallen/loose palm fruit on the company's plantation.	Narrowing of living space in the forest. The ancestral heritage land was converted to an oil palm plantation. Damage to places considered sacred. All the above impacts resulted in a dispute/conflict with the company

The Javanese transmigrants moved to the study area in 2005, following the oil palm nucleus-plasma transmigration program that did not proceed as planned. Therefore, the community started planting oil palm in 2010 independently and later received capital assistance from the government. In 2021, around 85% of the community studied owned oil palm gardens with an average of 1 hectare of holding area to optimize the agricultural land provided by the government. This average exceeded the area of land provided by the government. Each family of the transmigrant received 0.75 ha agricultural and 0.25-yard land. The second 1 ha of agricultural land was replaced with money. As a result, many transmigrants purchased rice fields and agroforestry land from the local Jambi Malay residents in the surrounding villages.

The Javanese transmigrant earned about IDR.2.5 million per harvest from an area of 1 ha oil palm garden, with an average annual income of IDR.60 million. Most of the harvest was sold to local Jambi Malay middlemen. Moreover, the transmigrant families earned non-cash income from secondary crops planted in the oil palm tree rows and house yards, as well as rice. This non-cash income was used for daily consumption.

The results showed that 17% of the transmigrant families worked as laborers on oil palm plantations owned by companies, earning IDR.100,000 per day for maintenance work. During harvesting time, the laborers received a wage of IDR.200,000 per ton of palm harvested. In a day, they harvested 1.5 to 2 tons of oil palm fruit.

About 82% of the transmigrant community stated that oil palm gardens had increased their economic status. However, 12% responded that the activities had a little economic impact, while 6% denied observing any impact.

The oil palm plantation development seems highly profitable for the Javanese transmigrants, though the community faces problems such as land grabbing by the company. In 2014, the government issued a permit to the company to develop an oil palm plantation covering 2,250 ha. This happened at a time when the production forest area was insufficient to meet the quota needed for conversion. Therefore, the company persuaded the Jambi Malay residents who had surrendered the forest land to become a transmigration area controlled by the government. Several Jambi Malay residents requested the land back and sold it to the company. The company took over nearly half of the oil palm gardens belonging to the transmigrants in Mekar Sari village. The transmigrants complained about this issue to the Regency government and the Ministry of Transmigration in Jakarta, but the problem was not resolved.

The Jambi Malay community benefits significantly from the development of oil palm plantations. In 2014, the community developed oil palm gardens independently or in partnership with an oil palm company through the plasma-nucleus program. Around 250 ha of oil palm plantations belonging to 22 families, with an average of 11 ha per family. This land is managed in partnership with an oil palm company.

Starting in 2019, those partnering with oil palm companies started earning 50% of net profits equivalent to IDR 1 to 1,2 million per ha per harvest. The families could earn an annual income of IDR.24-24.8 million per ha, or IDR.264-272.8 million per 11 ha on average, assuming that the harvesting was performed twice a month. In comparison,

the families managing their oil palm gardens earned around IDR.2.5 million/ha/harvest, equivalent to an annual income of around IDR.120 million from 2 ha of oil palm gardens.

The Jambi Malay community also benefits from the oil palm plantation expansion by working as daily laborers, earning IDR.100,000 per day. During harvesting time, the laborers earn IDR.200,000 for every ton of palm harvested. The results showed that 13% of the studied Jambi Malay community worked as daily laborers for oil palm companies.

At least 33% of the community stated that the oil palm plantation was sufficient to promote an increase in the economy. Also, 67% said that oil palm development increased the community's livelihoods insignificantly.

The expansion of oil palm plantations has significantly changed the livelihood system of the Jambi Malay community. Many community members were no longer practicing upland agriculture (*Umo renah or Umo Talang*) due to the conversion to oil palm gardens. However, some community members still kept their rubber gardens and or agroforestry land (*Perelak*).

The community obtains fruits, fuelwood, and timber for house construction from *perelak.* However, those with no *perelak* occasionally took the timber from the protected Bukit Duabelas National Park area.

The oil palm plantation development almost did not provide significant benefits and even disrupted the livelihood and cultural systems of the *Suku Anak Dalam* which relied on the forest. The development has also created conflict with oil palm plantation companies.

Figure 3. The *Suku Anak Dalam* picking loose fruit (a), the Jambi Malay community, and the Javanese transmigrant in their oil palm plantations (b and c).

Table 1 shows that the *Suku Anak Dalam* has a nomadic lifestyle and a livelihood system depending on forest resources. This survival mode and livelihood system were disrupted with the establishment of an oil palm plantation in the Kejasung forest area. The *Suku Anak Dalam* community complained because they thought the company had converted *gedong obat,* a forest area that provided herbal medicinal ingredients (Figure 1). Moreover, the company was accused of converting *bedewo* land believed to be inhabited by the spirits and *peranaan* land, a place where pregnant women give birth. The conversion of these forest areas to oil palm plantations sparked conflict between

the community and the companies.

The conversion of part of the *kejasung* forest to an oil palm plantation also impacted the *melangun* tradition, a religious rite related to the death of a community member. According to this tradition, a family leaves its previous settlement area and finds a new one if a family member dies. *Melangun* is also performed to avoid bad luck or the spread of infectious diseases suffered by the dead. By the time of the study, the duration and distance of this tradition were shorter. This is because the previous *melangun* route was converted into an oil palm plantation (Berta, 2014; Nauli et al., 2019; Prasetijo, 2011; Pratama & Auliahadi, 2019).

Almost no *Suku Anak Dalam* community has an oil palm garden except the community leader (*temenggung*). Most of the community collects loose palm fruit (*brondolan*) when harvesting is conducted on company-owned plantations (Figure 2). This was prohibited, though the company lets people collect the fruits. Loose fruit collectors could gain around 50kg/day worth around IDR,80,000.

The company took action when someone took fruit bunches from the tree without permission. In November 2020, a *Suku Anak Dalam* community member was killed after being suspected of theft. The murder was executed by a former village head working for an oil palm company. The case was handled by the police and was still in court when this study was conducted.

4.3 Hope for Future Prosperity: Reverse impacts of Oil Palm Plantation Development

Studies have shown the contribution of oil palm expansion to economic growth, despite its negative environmental impacts. The expansion of oil palm through private companies, the state, and the community has significantly contributed to Indonesia's national economy (Purnomo et al., 2020). Furthermore, the expansion also contributes to regional development (Mukrimin, 2022) and positively impacts the provision of private goods (Krishna & Kubitza, 2021).

This study also showed that many people benefit from the development of oil palm plantations, though some conflicting symptoms exist. The development has significantly benefited certain groups but threatened the livelihoods of others.

Oil palm development among the Jambi Malay and Javanese transmigrant contributed to economic growth in the surrounding villages and opened job opportunities for many others. This is in line with Potter (2011), Syahza (2011), and Raharja et al. (2020) that independent oil palm cultivation has increased farmer welfare. The success of the Javanese transmigrant in cultivating oil palm has promoted the Jambi Malay to start investing independently. The ease of selling palm oil crops at a profitable price is the main trigger for the Jambi Malay to participate in the business. According to Li & Semedi (2022), non-indigenous communities were willing and able to cultivate oil palm plants independently. The communities did not need encouragement from companies to actively engage in this global market-oriented business.

In contrast, the expansion of oil palm plantations has caused problems for the indigenous people examined in this study. The *Suku Anak Dalam* depends heavily on the forest for their livelihood and is relatively secure in Bukit Dua Belas National Park. The park management recognizes the community's existence. Certain forest areas have been designated as traditional and religious zones for the community to continue their lives (Figure 1). However, their presence in forest areas outside the national park area is not considered. Places and areas where the community lived in the past have been converted into oil palm plantations without considering their presence.

Some studies have shown that forest is key for the community's traditional or religious spaces and livelihoods for generations (Najib, 2020). Therefore, the

conversion of the forest threatens the community's livelihood system of hunting and gathering, as well as the nomadic habit. The oil palm companies' failure to return customary land or share the profits contributes to the marginalization of the indigenous communities. According to Elmhirst et al. (2017), the future happiness of indigenous peoples would be unclear when forests are not a source of sustainable livelihoods.

The oil palm development impacts on the indigenous community of *Suku Anak Dalam* confirm recent studies. For instance, Runtuboi et al., (2021) found that the negative impact of developing oil palm plantations is also felt by the Indigenous Papuan community. This community has lost access to traditional livelihoods, settlements, and sociocultural attachment.

5. CONCLUSIONS

The study found that the oil palm plantation development has impacted the livelihood systems of various communities. The development has had positive economic impacts on non-indigenous groups, such as the Jambi Malay and the Javanese transmigrant. For instance, it has created jobs and improved the communities' welfare. However, the development has disrupted and threatened the livelihood sustainability and the culture of indigenous community groups, such as the *Suku Anak Dalam*, which depends dominantly on natural forest resources.

This study recommends various efforts in responding to rapid socio-economic and environmental change and providing more benefits to all communities. The primary focus should be given to indigenous people whose livelihoods are threatened by the oil palm plantation development. The government should protect indigenous groups such as the *Suku Anak Dalam* community from the negative impacts of the development by recognizing their existence as forest dwellers.

This study showed the impacts caused by the expansion of oil palm plantations on indigenous and non-indigenous communities. In addition to this, the study identified some indigenous communities participated in the government's resettlement program which were resettled in new areas around or adjacent to oil palm plantation areas. Subsequently, this community might be affected similarly to the indigenous groups maintaining a way of life in the forest or to the one felt by non-indigenous communities, or slightly different. The impacts share certain characteristics that need further analysis.

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