Socioeconomic and cultural impacts of oil palm plantation development in Indonesia

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Abstract. Oil palm industries in Indonesia continue to grow and gave impacts for communities around the plantations. For this cause, it is significant to identify the socio-economic and cultural impacts on the residential districts around the oil palm plantations and the community's perceptions of the existence of oil palm plantations. The purpose of the study was to assess the social, economic and cultural impacts of oil palm plantations on the local community and their perceptions of oil palm plantations existence. The research was carried out in several oil palm plantations in Central Kalimantan, West Kalimantan, Lampung, South Sumatra, Riau and Merauke during the 2015-2017 period. Data collection was gathered through literature studies, Focus Group Discussions (FGD), Likert Scale questionnaires and observations. Data analysis were carried out using both qualitative and quantitative approaches. The results showed that the existence of oil palm plantations influenced the lives of the surrounding communities. On the socio-economic aspect, the existence of oil palm plantations had opened up employment opportunities, opened and increased business opportunities, and increased community incomes. On the socio-cultural aspect, the existence of oil palm plantations has helped in building educational, religious, health and other infrastructure facilities. Nevertheless, it could not be denied that positive impacts have also led to various social changes within the society, including changes in the people's lifestyles and reduced community social encounterment.

1. Introduction
Globally, Indonesia is the nation with the largest CPO producer due to the rapid growth of oil palm plantations, which has escalated by 37.7 times during 1980 to 2016. In 1980, the total area of the plantation was only around 300,000 ha, which in 2016 has reached 11.6 million ha. The increase has made Indonesia as the largest CPO producer, as well as placing oil palm as one of the biggest foreign exchange contributors [1] in Indonesia with a value of USD 17.8 billion. In addition, the development of the oil palm industry has also created many jobs for the community and indirectly helped in accelerating the development of village infrastructures around the plantations. This condition ultimately has affected the economic development of the village. As revealed by reference [2], [3], [4], the development of oil palm plantations have contributed to village development.

In the midst of economic benefits, oil palm industry is inseparable from various issues related to environment and culture. Of the environmental aspects, development of oil palm plantations are thought to reduce water quality [5], [6], [7], cause loss of wildlife habitats [8], [9], [10], [11] and induce global climate change [9], [10], [11]. Whereas, the negative social and cultural impacts include the increasingly fading culture especially the role of customary institutions, reducing cohesions of
community relations, discrimination against local communities [9], land disputes [12], and loss of access to natural resources [9]. These issues are considered as black campaign against oil palm since oil palm are one of the most oil-producing plants and consumed around the world, hence more profitable compared to other vegetable oils. The advantages of oil palms include high oil productivity, superior potential for food products, and wide application potential [13].

Based on these backgrounds, it is important to identify the community’s perspectives related to the development of oil palm plantations. Does the community around the plantations consider oil palm plantations to have negative or positive impacts? Thus, the purpose of the research is to assess the perceptions and impacts of oil palm development in the socioeconomic and cultural aspect.

2. Materials and Methods
The study was conducted in 2015-2017 in the Provinces of South Sumatra, Lampung, Central Kalimantan, West Kalimantan and Papua (table 1). The study focused on the perceptions and impacts of oil palm plantations on the socioeconomic, culture and infrastructure development (table 2). Data were collected using Rapid Rural Assessment (RRA) technique that integrated literature studies, questionnaires, in-depth interviews, FGD and observation.

| Table 1. Study location of assessment the perceptions and impacts of oil palm development |
|---|
| No | Province | District | Sub-district | Village |
|---|---|---|---|---|
| 1 | South Sumatera | OganKomeringIlir | Sungai Menang | a. Gajah Mati  
   b. Sungai Ceper  
   Cengal | a. Sungai Jeruju  
   b. Sungai Pasir |
| 2 | Lampung | Lampung Utara | Abung Selatan | a. Candimas  
   b. Klaibening Raya  
   c. Bumi Raya  
   d. Ratu Abung  
   e. Kemalo Abung  
   f. Kembang Gading  
   Kotabumi Selatan | a. Tanjung Senang  
   b. Kelapa Tujuh |
| 3 | Central Kalimantan | Kapuas | Dadahup | a. Sumber Alaska  
   b. Sri Mulya  
   c. Sumber Makmur  
   d. Dadahup  
   e. TambakBajai |
| 4 | West Kalimantan | Sintang | Ketungau Tengah | a. MargaHayu  
   b. Swadaya  
   c. Senangan Kecil  
   d. Wirayuda  
   e. Wana Bakti  
   f. Mungguk Gelombang |
| 5 | Papua | Merauke | Ulilin | a. Belbeland  
   b. Mandekman  
   c. Rawahayu  
   d. Kerely  
   e. Kafyamke  
   f. Baidub  
   Elikobel | a. Sipias  
   b. Metaat Makmur  
   c. Bupul Indah  
   d. Tof-tof  
   e. Bouwer  
   f. Bumun |
### Table 2. Study aspects of assessing the perceptions and impacts of oil palm development

| No | Aspect       | Criteria                  | Data Collection                                      | Analysis          |
|----|--------------|---------------------------|------------------------------------------------------|-------------------|
| 1  | Socioeconomic| a. Jobs opportunities     | • Literature study                                    | Qualitative       |
|    |              | b. Business opportunities | • FGD                                                 | descriptive       |
|    |              | c. Income certainty       | • Questionnaire distribution                          |                   |
|    |              | d. Welfare                | • Observation                                         |                   |
|    |              | e. Basic material needs   |                                                      |                   |
| 2  | Socioculture | a. Work ethic             |                                                      |                   |
|    |              | b. Institutional          |                                                      |                   |
|    |              | c. Education              |                                                      |                   |
|    |              | d. Togetherness           |                                                      |                   |
| 3  | Infrastructure| a. Electricity             |                                                      |                   |
|    |              | b. Accessibility          |                                                      |                   |
|    |              | c. Clean water            |                                                      |                   |
|    |              | d. Education facilities   |                                                      |                   |
|    |              | e. Religious facilities   |                                                      |                   |
|    |              | f. Common facilities      |                                                      |                   |

Literature study was carried out by collecting and studying related documents, including reports related to social aspects (EIA Documents, RKL/RPL Documents, statistical figures, various company documents on: Corporate Social Responsibility (CSR), Standard Operational Procedure (SOP) (Environment, Occupational Health and Safety/LK3), and other documents related to the socioeconomic and cultural aspects of the communities.

The questionnaire was constructed using closed-ended type with scoring system. The scoring system is one of the structures that are easy and commonly used in qualitative research, although in its use, there are often errors and weaknesses in the form of consistency in the score structure and weaknesses in the indicator setting of each scoring unit. One method used to overcome this problem is to compose a Likert Scale into a structured score. Although, technically the scale use numerical value from 1 to 5, but following the character of the Indonesian people, the scale should be changed to 1 to 7 [14]. The 7-point scale would also add to the reliability. The value of 1 is given to statements with "strongly disagree" responses, 2 for "disagree", 3 for "somewhat disagree", 4 for "indifferent", 5 for "somewhat agreed", 6 for "agree", and 7 for "strongly agree". The meaningful pattern can be adjusted according to needs, for example, is a range of "very dissatisfied" to "very satisfied", or a range of "very low" to "very high".

In-depth interviews were conducted to explore the people's opinions and views regarding the social impacts that have and were expected to emerge in the future. Interviews were conducted with key persons interviews to dwelve into a problem following the areas of expertise or authority of each key respondent in each village. For this reason, the selection of key respondents was done using purposive sampling. The number of respondents in each village varied according to their needs and conditions. In addition, interviews were also conducted with other related sources who were considered to have understand on the key or social issues, based on previous documents studied.

FGD activities were carried out in the villages in and around the company's area with the aim of:

- As a forum for problem-solving, if document reviews, observations and interviews found that solutions should be made, and to obtain more in-depth inputs to formulate current social impact studies when the company operates and in the future;
- Sharpened various issues, problems and needs related to social, economic and environmental impacts on the community around the company; and
- Determine the perceptions and obtain inputs from stakeholders on the various issues concerning to oil palm plantation management, conflict resolution and social management plans as well as community needs and expectations of the oil palm plantations.

The FGD activities were carried out by involving local leaders and local government officials and other parties who were considered competents with the issue of studies, such as the Chief of Village,
BPD, Village Team, village officials, leaders of local institutions, community leaders, religious leaders and other community members. The FGD were intended to build perceptions of the groups targeted by the activity.

Field observations were very important to have an understanding of the current field conditions and factual situations, related to the object of study or the issue under study; verification of conformity between interview data and actual conditions and ensure visually the extent to which the expected impacts appear can or cannot be overcome; and explore deeper information through direct observation in the field of various matters concerning socioeconomic conditions in and around the company.

Then, the data analysed by descriptive-qualitative to describe the social, economic and cultural conditions of the community. Information on community perceptions of the impact of oil palm plantations were gathered utilizing the following formula [15]:

$$I = \frac{\text{Distance}}{\text{Number of Classes}}$$

Explanation: \(I\)=Class Interval, Distance=Highest value reduced by lowest value, Number of Classes=the number of intervals or categories specified so that the interval value is obtained,present in figure 1.

| 1.00 | 1.86 | 2.73 | 3.58 | 4.45 | 5.32 | 6.19 | 7.00 |
|------|------|------|------|------|------|------|------|
| Strongly Disagree | Disagree | Somewhat Disagree | Indifferent | Somewhat Agree | Agree | Strongly Agree |

**Figure 1.** Perception interval scale

### 3. Results and Discussion

#### 3.1. Development of oil palm plantation in Indonesia

Oil palm was introduced in Indonesia in 1848 by the Dutch and planted in the Bogor Botanical Gardens, which was then commenced to be commercially cultivated in 1910 because these plants flourished and had been tested in several regions. The growth of plantations in Indonesia refered to Act Number 39 of 2014 concerning Plantation (referred to as the Plantation Act). Article 2 of the Plantation Act states that plantations are carried out based on the principle of benefit and are sustainable, integrated, together, openly, and equitable. While in Article 3, it is stated that the objectives of plantation development are to increase community's income and provide job opportunities.

The oil palm industry in Indonesia continues to see rapid development so that in the end it places oil palm as the highest contributor to foreign exchange in Indonesia (figure 2). Oil palm plantations thrived throughout Indonesia (figure 3). In general, according to the ownership, oil palm plantations in Indonesia can be divided into three categories, i.e., private-owned, state-owned and community-owned. Presently, private oil palm is the biggest contributor of CPO in Indonesia (figure 4), which are exported to China, India, Pakistan and Africa.
Source: Indonesian oil palm statistics 2016

**Figure 2.** Oil palm area and production development in 2011-2016 period

**Figure 3.** Oil palm plantation area in Indonesia
3.2. *Socioeconomic impacts of oil palm plantation development*

The existence of industries including oil palm plantations provided benefits to the local communities. According to the statements by reference [3] and [16], the industry has provided a multiplier effect [3] and reference [17] states that the oil palm industry brings major changes to rural communities, especially in terms of the economy. Established on the research conducted, it was recognized that the existence of oil palm plantations has positive impacts on the local villages (figure 5). This is in line with research by [18], which also demonstrates the economic benefits of oil palm growth.

![Figure 4. Oil palm plantation area based on ownership](image)

**Figure 4.** Oil palm plantation area based on ownership

![Figure 5. Socioeconomic impacts of palm plantations](image)

**Figure 5.** Socioeconomic impacts of palm plantations
The existence of oil palm plantations provided huge amount of work opportunities for the community, starting from daily labour to permanent employees[19], [20]. Nevertheless, most of the people in the study sites, comprised of more daily labourers as harvesters, applicators and other related tasks that did not necessarily require extra skills. This happens because generally, the surrounding communities has low education levels. With more people having permanent jobs, the monthly incomes could be secured, hence enhanced the economic flow in the village, which increased the people's purchasing power and in turn increases the mobility of goods and services [18]. People who previously worked as farmers did not have certainty in terms of income due to weather factors, amount of production and prices that could change. The existence of the oil palm companies guaranteed the flow of incomes to households from monthly salaries. This was backed up by statements of [21], [22], [23], [24], [25]. The communities would be able to use these revenues for various purposes, especially those that are consumptive, such as buying motorized vehicles, repairing houses, buying clothes, buying household furniture and even sending their children to higher education schools.

Besides providing job opportunities, the existence of oil palm plantations also provided various new commercial enterprise opportunities for the residential areas. The bulk of the community previously only worked in farming, especially the rubber plantation. However, with the presence of oil palm companies, business opportunity grew like stalls for necessities, restaurants, and so on. As told by references [26], [27], the expansion of oil palm plantations provided diverse investment opportunities. The existence of the companies have indirectly brought in workers from outside the village, so the opportunity to work was greater because of market opportunities that have not existed previously. Reference [3] states that industrialization of agriculture can be an attraction in the output development and growth in other economic sectors. Meanwhile, some other business opportunity was to convert rubber into oil palm. A large number of rubber farmers converted to oil palms due to higher oil palm prices, definite market, not affected by weather and safer from theft. Furthermore, oil palms were favoured due to its simplicity of managing [29], [4] and produced higher incomes [26]. The existence of the companies, hence have directly affected the local welfare, due to the strengthening of the economy. As a consequence, there are at least 4 economic sums obtained by the community, namely working as employees, plasma receipts, private oil palm sales and opening of new business. References [29] and [30] state that to strengthen the people's economy, industrialization of agriculture is something that must be practiced.

3.3. Socio-cultural impact of oil palm plantation development

The existence of companies in the study location have directly or indirectly influenced the socio-cultural life of the community, including work ethic, institutional, access to education and community cohesiveness. Contrary to the economic aspects, which almost entirely increased, the socio-cultural aspects faces some declines (figure 6).

Work ethic was one view that changed due to the existence of oil palm plantations. It caused negative impacts, since the certainty of income, has lowered the need to work too hard as before experienced. Meanwhile, it could be positive because there were also people who doubled their work. From morning until noon, the people worked in the company and in the afternoon they worked in the plantation for extra cash. This was in accordance with the statement by [30], whom states that oil palm plantation business allows the community to have other incomes.

The general strategy run by companies to draw close the community is through institutions and influenced at the hamlet layer. Thus, the role of village heads and tribal leaders would be greater, especially in resolving problems that would be faced by companies, such as in terms of land acquisition and other issues related to the interests of the community [5]. The presence of companies also have directly influenced the dynamics of formal institutions that grew and developed in the community, such as the formation of plasma cooperatives. Plasma cooperatives were formed indirectly as the consequence of the existence of plasma plantations managed by plasma recipients.
Figure 6. The socio-cultural impacts of oil palm plantation development

As previously explained, the majority of the surrounding community works at a lower level in the company. This has made the parents have higher awareness towards the importance of education for their children. Higher education was expected by the community to open up better opportunities for their children for their future employments, such as staff of oil palm companies (monthly employees). In addition, the existence of scholarships provided by the companies for local dropped out students have encouraged students. Not only for students, but the company have also employed several honorary teachers in the village. This is in line with research [18] which states that oil palm plantations affect the level of education in the family.

One of the consequences of working in the company was the attachment to working time, which has indirectly reduced community gathering time. Grounded along the outcomes of the FGD, it was recognized that the demands of higher life have increased the awareness of the need to improve welfare by working in companies, thus they consumed more energy and time, and consequently decreased willingness to cooperate and sensitivity to others. This phenomenon often altered the community to become individualistic within the society. Yet, normally, people would take advantage of holidays or Sundays to gather even though it was just for a few days. This is in line with the research result by [24] who finds that the communities close to oil palm plantation lose their opportunities to actively engaged in village activities.

3.4. Impact of oil palm plantation on infrastructure

Infrastructure is everything that form the main supports for the implementation of a process (business, development, projects, etc.). The existence of oil palm plantations through CSR programs has assisted in the construction or upkeep of infrastructure in the surrounding villages. Based on Act 40 of 2007 on Limited Liability Companies, CSR is the company’s effort to lift its image in the public eye by creating charity programs, both external and internal, with the objective of increasing the legitimacy of local residential areas and increasing community ownership of the society. Oil palm’s impacts of infrastructure development can be ascertained from the growth in infrastructure before and after the existence of oil palm plantations (figure 7). Grounded on this, it could be assured that in the prospect of infrastructure, there was an increase after the existence of oil palm plantations. This was consistent with several surveys, which stated that the existence of oil palm plantations provided CSR assistances [5], [32].
The impact on electricity infrastructure compared to other aspects of infrastructure was not too significant. This was because not all companies in the study locations assisted in providing electricity infrastructure for their CSR programs. Electricity facilities provided by the company could be in the form of solar panels, construction of electricity poles connected to the factory or in the form of fees for the purchase of gasoline (generator usage).

Accessibility was the most important impact felt by the community. Existence of oil palm company has opened up access to the isolated villages. In addition, the opening of roads has indirectly increased the mobility of the community so that the economy flow was alive. In return, it also provided easier access to school (middle and high school). These conveniences would indirectly increase the motivation of students to go to school diligently and also the parents to send their children for higher education. The access have also increased the mobility of traders from outside the villages that brought household needs, which could not be fulfilled from inside the villages, hence the communities could purchase commodities at lower prices. This is consistent with research by [18] whom states that oil palm plantations facilitate access and provide school buses.

The existence of oil palm plantations was also inseparable from the existence of environmental matters in the form of river water pollution or drought. For this reason, companies generally would build drill wells at certain points that could be used by the community, especially those who were still using river water for washing and latrines (MCK). This is in line with research by [31] that the existence of oil palm plantations makes it easier for communities to obtain clean water.

Related to education, the companies have assisted in both directly building school facilities or offered other educational facilities (such as tables or chairs). In the aspect of worship, companies generally would assist in the form of fundings or goods in the case of construction of religious facilities or activities. Meanwhile, the company also provided assistances to improve village facilities such as development of health centres, sports facilities or village offices.

4. Conclusion
In general, the communities showed positive perceptions towards the development of oil palm plantations, due to the positive outcomes that the society has enjoyed, especially related to socioeconomic aspects, social culture and infrastructure. In the socioeconomic aspects, the benefits of oil palm development for the community include the accessibility of jobs, increased business opportunities, enhanced community income and certainty of income. In the social-cultural aspects, the impingement of the development of oil palm plantation includes enhanced community knowledge and
skills, work ethics and community awareness of education and village institutions. In the aspect of infrastructure, the existence of oil palm plantation through CSR programs has provided assistances to the surrounding villages related to infrastructure development, such as in opening access and repairing road conditions, providing facilities for health, education, religion purposes and community needs such as clean water and electricity. Meanwhile, the negative impacts of oil palm development arose due to the problems with land claims and environmental shocks. Fortunately, these problems could be overcome.

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