



Land-use change and income inequality in rural Indonesia

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ABSTRACT

Many regions in Southeast Asia are experiencing massive land-use change. While areas covered with tropical forests and traditional agricultural crops, such as rubber, are shrinking, oil palm plantations are rapidly gaining ground. Recent studies have analyzed environmental effects of this land-use change. Relatively little is known about the socioeconomic implications. A few studies have examined economic effects of oil palm cultivation for particular groups of households, such as farmers, but broader effects for different types of rural households are not yet well understood. We address this research gap with data from farm and non-farm households in rural Jambi, one of the hotspots of Indonesia's recent oil palm boom. On average, farm households have significantly higher incomes than non-farm households that often work as agricultural laborers on rubber and oil palm plantations. Both farm and non-farm households are better off in villages with a large share of the land under oil palm than in villages where relatively more rubber and other crops are grown. Oil palm does not seem to have significant effects on overall rural inequality. While oil palm cultivation contributes to increasing inequality among farmers, it tends to decrease income inequality among non-farm households through labor-market and employment effects.

1. Introduction

Many regions in Southeast Asia have recently experienced considerable land-use change. Land areas covered with tropical forest and traditional agricultural crops, such as rubber, have been shrinking. At the same time, oil palm plantations were expanded rapidly. The expansion of the oil palm area was instigated by rising global demand for vegetable oils and biofuels. Palm oil is now the most traded vegetable oil in the world; there is no other crop that yields higher quantities of edible oil per unit of land (Sayer et al., 2012; Cramb and McCarthy, 2016; World Bank, 2017; USDA, 2017). Indonesia is the world's leader in palm oil production with an estimated global market share of 55% (FAO, 2017; USDA, 2017).

These land-use changes have far-reaching environmental and socioeconomic consequences. The expansion of oil palm plantations was found to be associated with deforestation, biodiversity loss, increased greenhouse gas emissions, land conflicts, displacement of forest-dependent tribes, and other social problems (Naylor et al., 2007; Fitzherbert et al., 2008; McCarthy, 2010; Wicke et al., 2011; Cramb and Curry, 2012; Obidzinski et al., 2013; Margono et al., 2014; Abood et al., 2015; Susanti and Maryudi, 2016; Tsujino et al., 2016; Kunz et al., 2017; Prabowo et al., 2017; Purnomo et al., 2017; Purnomo et al., 2018). On the other hand, oil palm cultivation has contributed to rural

income growth and economic development (Feintrenie et al., 2010; Rist et al., 2010; Lee et al., 2014; Castiblanco et al., 2015; Gatto et al., 2017; Purnomo et al., 2018). While many of the oil palm plantations were established by large public and private sector companies, approximately 40% of the oil palm area in Indonesia is managed by smallholder farmers (Euler et al., 2016).

Several recent studies with household-level data from Indonesia have shown that smallholder farmers can benefit significantly from cultivating oil palm, in terms of income gains and improved living standards (Euler et al., 2017; Krishna et al., 2017). However, not all farmers are able to cultivate oil palm, because the crop is capital-intensive and local farm households are often credit-constrained (Kubitza et al., 2018a). Even among those farmers who managed to establish oil palm plantations, the benefits are heterogeneous, because of unequal access to inputs, technical know-how, and other factors of production (Krishna et al., 2017). Hence, oil palm expansion may contribute to rising inequality among farmers (McCarthy, 2010), even though effects on income distribution have not been analyzed explicitly. In addition to farmers, landless rural households may also be affected through land-use change. A recent study with data from Sumatra, Indonesia, showed that own farming activities are the main source of income for less than half of all rural households; for most of the rest working on other farms and company plantations as laborers is the major source of household

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income (Bou Dib et al., 2018). In how far the expansion of cash crops in general, and of oil palm in particular, affects the incomes of non-farm households and rural income distribution more broadly is not yet sufficiently understood. This is a relevant research gap, because landless households often belong to the poorest of the poor in rural areas. The present study makes an attempt to contribute to a better understanding.

In particular, we use representative data from rural areas of Sumatra, covering both farm and non-farm households, to analyze and compare income levels, income structures, and sources of inequality with a particular focus on oil palm and rubber. The data were collected in 2015 in 26 randomly selected villages in Jambi Province. Observed regional differences in agricultural land-use types are used to compare mean levels of income, poverty, and inequality between villages with smaller and larger proportions of oil palm land. The rest of this article proceeds as follows. The next section provides some background on oil palm expansion and the situation of poverty and income inequality in Indonesia. The data and statistical approaches are explained in Section 3, while the empirical results are presented in Section 4. Section 5 discusses the results in a broader context, while Section 6 concludes.

2. Background

2.1. Oil palm expansion in Indonesia

Palm oil is a very important ingredient for a number of foods and cosmetic products, and is considered the cheapest source of vegetable oil in international markets (Miyake et al., 2012). This has resulted in the rapid expansion of oil palm plantations in tropical areas of Southeast Asia. Since 2009, Indonesia has been the largest producer of palm oil worldwide (Fig. 1).

In addition to the rising demand from international markets, the growth of the palm oil industry in Indonesia and the involvement of smallholder farmers were also spurred by the Indonesian government's transmigration program in the 1980s and early-1990s (Gatto et al., 2017). The transmigration program involved the voluntary resettling of households from densely-populated Java to less-densely populated islands, such as Sumatra. Families participating in this program settled in newly-established transmigrant villages, where they were allocated 2–3 ha of land and supported in the cultivation of agricultural crops through the provision of subsidized credits, inputs, and technical advice (McCarthy, 2010). In the early 1980s, transmigrant families were

primarily supported in the cultivation of rubber. Since the mid-1980s, the government's focus had switched to oil palm (Krishna et al., 2017).

In the late-1980s, almost all smallholder farmers cultivating oil palm were transmigrant families that produced the crop under government-sponsored contracts with public or private companies. Since the mid-1990s, more and more autochthonous farmers had also started to cultivate oil palm, delivering their produce to nearby company mills, mostly without any contracts (Euler et al., 2016). Today, transmigrant and autochthonous families produce oil palm mostly without contracts. Most of the initial contracts expired, and – without the government-subsidized credits – most farmers find it more attractive to cultivate oil palm independently (Gatto et al., 2017). Fig. 2 shows the development of the oil palm area in Indonesia since 1990. In 2016, around 40% of the total oil palm area was managed by smallholder farmers.

2.2. Land-use change in Jambi

This study focuses on Jambi Province on Sumatra Island, one of the hotspot regions of the recent oil palm boom in Indonesia (Drescher et al., 2016; Clough et al., 2016). Historically, Jambi was covered by tropical rainforest, but significant deforestation already occurred during the first half of the twentieth century, instigated by the rising international demand for timber and natural rubber. Rubber has been cultivated in Jambi for > 100 years and has been the dominant cash crop in the region until recently (Gatto et al., 2015). Rubber in Jambi is primarily grown by autochthonous farm families and to a lesser extent by public and private companies. When the oil palm boom started in the 1980s, new oil palm plantations were mostly established on degraded (logged) forestland. Between 1990 and 2016, the area planted with oil palm in Jambi almost quadrupled (Fig. 3). During the same period, the forest area decreased by more than one million hectares (Margono et al., 2012; Clough et al., 2016).

Interesting to see in Fig. 3 is that the rubber area in Jambi also increased until recently. For autochthonous farm households, rubber remains the dominant crop. Rubber is less capital-intensive than oil palm, and rubber trees can remain productive for many decades (Feintrenie et al., 2010; Lee et al., 2014). Hence, switching from rubber to oil palm was not often observed as long as additional land was still available. Only more recently, with declining rubber prices and increasing land scarcity, oil palm is gradually replacing rubber plantations (Euler et al., 2017).

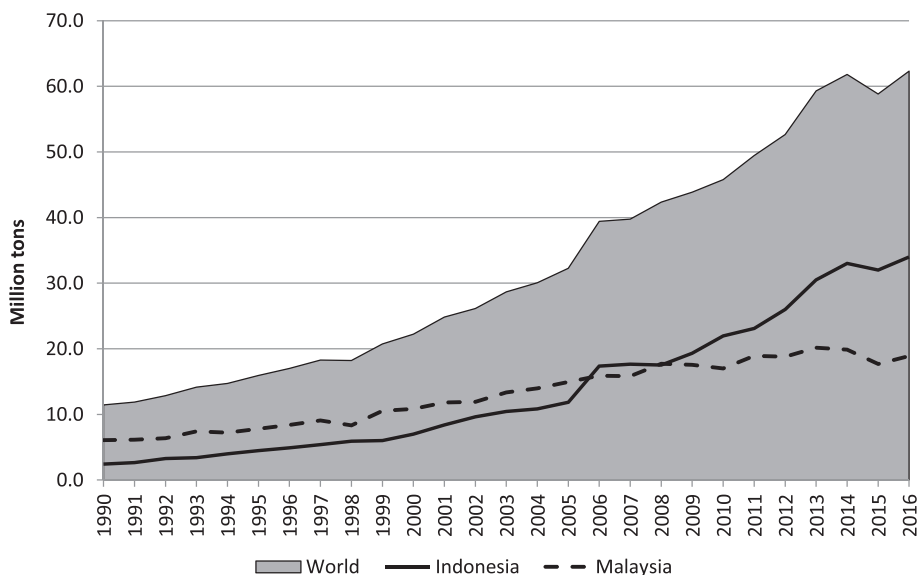


Fig. 1. Palm oil production between 1990 and 2016.

Sources: Own presentation based on data from FAO (2017), USDA (2017), and DJP (2017).

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