



Collective action in a smallholder oil palm production system in Indonesia: The key to sustainable and inclusive smallholder palm oil?



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ABSTRACT

Indonesian smallholder oil palm generally yield much less than corporate plantations. We analysed a smallholder oil palm production system in West Sumatra which outperformed its nucleus estate plantation, consistently producing yields far above the national average for over 25 years. Its institutional setup allowed farmers to combine the advantages of smallholder and plantation agriculture by capitalizing on collective action. Collective action design principles (Ostrom, 1990; Cox, 2010) are used to assess the institutional setup of a smallholder production system. This case study demonstrates that with a strong institutional arrangement, smallholder oil palm farmers can participate in supply chains on advantageous conditions and substantially increase productivity, thereby contributing to both rural development and land sparing.

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1. Introduction

Global demand for vegetable oil will double from 120 to 240 million tons per year by 2050, driven by increasing *per capita* incomes and population growth (Alexandratos and Bruinsma, 2012; Corley, 2009). Palm oil will play a major role in meeting this future demand; a further 7–25 million ha of oil palm is projected to be required over the next 40 years (Corley, 2009). The prominent role of oil palm is due to its versatility in food and non-food uses and unparalleled ability to convert solar radiation, water and nutrients into vegetable oil under proper management (Corley, 2006; de Vries et al., 2010). With a combined 38% share of global vegetable oil production, palm oil and palm kernel oil are already the most traded vegetable oils in the world (USDA, 2016). Expansion of palm oil production, particularly in low-income countries, is regarded as crucial for meeting future demand of affordable edible oil (Corley, 2009; Shean, 2010).

With an estimated annual production of 33 M metric tons and a global market share of 54% in 2015/2016, Indonesia is the world's largest producer of palm oil (USDA, 2016). Nearly 75% of this was exported (USDA, 2016), generating US\$22.9 billion in export earnings from palm oil in 2014 (DJP, 2015). Oil palm undoubtedly has contributed substantially to national, as well as local economic development (Budidarsono et al., 2013; McCarthy and Zen, 2016; Rist et al., 2010). Zen et al. (2015) estimates that, based on current trends, oil palm expansion will continue to grow from 10.6 million hectare in 2013 to 13.7 million hectare in 2020.

Expansion of oil palm has had major impacts on land use (Brockhaus et al., 2012; Sayer et al., 2012; Wicke et al., 2011), deforestation and loss of biodiversity (Fitzherbert et al., 2008; Koh and Wilcove, 2007), and emission of greenhouse gases (Fargione et al., 2008; Pye and Bhattacharya, 2012; Zen et al., 2015). It is also associated with adverse socio-economic effects due to displacement of local populations (Colchester et al., 2006; McCarthy, 2010) and inclusion in oil palm value chains under unclear and disadvantageous terms, leaving smallholders vulnerable to manipulation by companies and government officials (Cramb, 2013; Gillespie, 2011; McCarthy, 2010). Yet, oil palm is a suitable crop for smallholder farmers and can provide high returns to land, labour and capital, and has improved the livelihoods for many

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smallholder farmers (Budidarsono et al., 2013; Feintrenie et al., 2010; Susila, 2004). Smallholder oil palm cultivation also carries the potential to stimulate rural development (Budidarsono et al., 2013; Hayami, 2010; Wiggins et al., 2010), particularly when compared with companies that transfer profits to urban shareholders, leaving migrant company workers in rural areas who contribute only marginally to the local economy (Sinaga, 2013). Smallholders have vigorously embraced oil palm and in 2015 cultivated roughly 40% of the oil palm area in Indonesia (DJP, 2015). Government statistics and multiple studies on smallholder oil palm production however show that smallholder oil palm farming is inefficient in land use with sub-standard yields (DJP, 2015; Zen et al., 2016).

In this article we analyse a highly successful smallholder plantation scheme, called Ophir, which includes 2400 smallholders managing 4800 ha of oil palm, to indicate that smallholders are not always poorly productive. This smallholder plantation has by far outperformed the national average for smallholders and many nucleus estates. By analysing the Ophir plantation, we seek to identify factors that could lead to more efficient smallholder production, and thereby address current sustainability challenges in smallholder oil palm cultivation. These include increasing productivity (Lee et al., 2013) and allowing smallholders to participate in oil palm cultivation on preferential terms (McCarthy and Zen, 2016). In conjunction with proper land use planning, increased production of smallholder systems can spare land for food, forest or other purposes (Baudron and Giller, 2014).

Smallholder production systems and corporate plantation systems have distinct advantages and disadvantages. The strengths of corporate plantation agriculture lie in the use of clear hierarchical structures (Goldthorpe, 1994; Mintzberg, 1979), low transaction costs due to scale, access to capital and market knowledge (Hayami, 2010; Hazell et al., 2010). Hierarchical structures allow for centralized coordination and control, formal assignment of tasks, standardization of production methods, and specialization of the workforce (Grandori, 1997). On the other hand, smallholder production has the advantages of efficient use of family labour, strong incentives to produce high yields due to the direct relationship between effort and reward, high commitment and low cost of monitoring workers (Poulton et al., 2010). Agency costs are an inherent disadvantage for corporate plantations because the idiosyncratic nature of agricultural production prevents easy measuring the result of hired labour (Byerlee, 2014; Hayami, 2010; Poulton et al., 2010). Yet the yields of smallholders are usually much less than those obtained by corporate plantations (DJP, 2015; Molenaar et al., 2013).

In this article we explain how in Ophir, through effective collective action, the advantages of plantation agriculture were combined with the advantages of smallholder agriculture. We use the design principles framework developed by Ostrom (1990) and updated by Cox et al. (2010) to analyse how this was achieved. On the basis of original data, we demonstrate that smallholder oil palm farming can be highly efficient in terms of yield and farmer income when the correct institutions are in place. Support for institutional development and facilitating collective action could provide an alternative to the current unbridled expansion of poor-yielding individual smallholder oil palm production systems, or corporate plantations with relatively high costs and limited benefits for local communities.

The remainder of this article is structured as follows. After the methodology section, a description of the Ophir plantation and the achievements of the Ophir smallholders is provided. Subsequently design principles for successful collective action are introduced. With this framework we analyse how collective action was achieved in the smallholder plantation and how this allowed

smallholders to capitalise on the advantages of small-scale agriculture as well as to reap the benefits of a large-scale plantation. In the final section we discuss findings and conclude what insights the analysis of the Ophir smallholder institutional set-up has given us regarding collective action in smallholder production systems and the usefulness of the design principles. Thereby we identify potentially useful components for including smallholders on preferential terms in modern agro-supply chains and specifically within the oil palm sector.

2. Methods

Data for this article is primarily based on a six-week field visit in 2009, in which 34 semi-structured interviews were conducted with 1) the leaders of the supra-cooperative, 2) the leaders of the five cooperatives, and 3) leaders of kelompok, the local term for farmer groups. A kelompok meeting in one of the cooperatives was attended. Interviews were held with the managers of the nucleus estate, local and international academics who performed research in the area, and three retired staff of the German development organisation GTZ, currently known as GIZ, involved in establishing the plantation. Multiple Ophir smallholders were interviewed as well as three workers in the Ophir plantation, and local community members not involved in the project. Further, a survey was conducted amongst 105 randomly selected farmers in a stratified kelompok sample framework, providing a proportional distribution of farmers from the different cooperatives. Former GTZ staff shared documentation on the support they gave to farmers in setting up the plantation. Long-term yield data was provided by the cooperatives and supra-cooperative. An introductory letter from former GTZ staff and a visit of former GTZ staff facilitated trust and engagement with the smallholders. In 2011, 2014 and 2016 the lead author revisited Ophir and interviewed farmers, cooperative staff and (former) supra cooperative staff.

3. History of the NES/PIR schemes

Oil palm has been cultivated at commercial scale in Indonesia since 1911 but production stagnated during World War II, only to be revived by the New Order regime which came to power in the late 1960s (Badrun, 2011; McCarthy et al., 2012). A major goal of the New Order regime was to revitalise the plantation sector to increase export earnings, capitalise on the availability of land and create job opportunities on the outer islands of Indonesia (Badrun, 2011; McCarthy et al., 2012; Zen et al., 2016). The Indonesian government created state-owned plantation companies that focused on the cultivation of export crops such as coffee, coconut, rubber and oil palm. With the support of the World Bank and Asian Development Bank the Nucleus Estate Smallholder/Perkebunan Inti Rakyat (NES/PIR) schemes were introduced in the late 1970s. The first wave of NES/PIR projects started in the 1980s, consisting of 31 schemes covering 213,011 ha of oil palms, with smallholders accounting for 148,590 ha (70%) and nucleus estates covering 64,421 ha (30%). First plantings with the NES/PIR schemes usually took place in fairly remote areas and ceased in 1994 (Badrun, 2011). Later waves of NES/PIR projects included PIR-Trans schemes and the PIR-KKPA (Kredit Kooperasi Primer Anggota) schemes in which the state-owned companies were replaced by the private sector. When the New Order regime collapsed the models changed again under the influence of a powerful oil palm industry, which argued that smallholder cultivation was inefficient (Gillespie, 2011). Smallholder schemes therefore further developed towards giving smallholders less responsibility in plantation management, less compulsory smallholder area and an increase in company management (Budidarsono et al., 2013; McCarthy, 2010).

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