



# Large-Scale Agricultural Investments and Smallholder Welfare: A Comparison of Wage Labor and Outgrower Channels in Tanzania

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**Summary.** — This article evaluates household welfare effects of large-scale agricultural investments in Tanzania, one of the main recipients of such investments in Africa. Specifically, the article compares households participating in sugar and rice investments through outgrower schemes or as agro-industry workers with non-participants in terms of household income and income poverty. Building on primary household data, it is one of the first studies to empirically analyze ex-post impacts of large-scale agricultural investments in Africa. The analysis draws on cross-section survey data of 516 households collected in Kilombero District, a priority cluster for the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). The results show overall positive household welfare differences between participants of the investments and the respective counterfactual. However, there are large differences between arrangements and subsectors. Estimated effects for outgrowers are largest, yet for land-rich outgrowers more so than for land-poor. Effects for agro-industry workers in the sugar investment are significantly larger than for those in the rice investment, though in both investments land-poor workers seem to benefit. Hence, the study results suggest potential benefits of outgrower schemes and potentials of agro-industry wage employment for the land-poor to escape extreme poverty. Yet, it also stresses particularly the need to address the constraints of land-poor outgrowers. Qualitative interviews, for example, pointed to growing risks for land-poor outgrowers in the context of rising elite capture by larger outgrowers.

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**Key words** — large-scale agricultural investments, impact evaluation, contract farming, wage employment, Africa, Tanzania

## 1. INTRODUCTION

The biofuels boom and sharply rising global food prices led to a massive surge in foreign investors attempting to acquire agricultural lands in developing countries since the mid-2000s (Deininger *et al.*, 2011). Sub-Saharan Africa (SSA) has received a major share of proposals for such large-scale agricultural investments (LSAI) (Cotula, Vermeulen, Leonard, & Keeley, 2009).<sup>1</sup> Recent estimates by Schoeneveld (2014) suggest 563 large-scale land deals during 2005–13 in 37 countries, covering nearly 23 million hectares. However, past experiences in SSA provide plenty of examples of failures of such investments (Collier & Dercon, 2009; Deininger & Byerlee, 2012). Many of the more recent LSAs have also been abandoned, especially those targeting biofuels (Maltsoglou, Koizumi, & Felix, 2013; Singh, Singh, Vermaa, & Patraa, 2014), or have not yet materialized (Land Matrix Global Observatory—LMGO, 2015). Still, the share of large-scale farming and investments in SSA is likely to rise in future, given the new technologies to manage large farms, growing demand for standardized products and Governments' motivations to expand into uncultivated areas (Deininger & Byerlee, 2012).

The potential implications of LSAs have been highly controversial. On the one hand, there are widespread concerns of substantial social and ecological risks of such investments that threaten the very livelihoods of poor farming households (Cotula *et al.*, 2009; German, Schoneveld, & Mwangi, 2013; Hall, 2011). Previous experiences in SSA also show that LSAs were often associated with substantial social conflicts with negative long-term repercussions (Deininger & Byerlee, 2012). Research by Arezki, Deininger, and Selod (2015) about the drivers of more recent LSAs likewise shows that LSAs have so far often targeted countries with weak governance systems and protection of poor people's land rights, reinforcing such concerns. On the other hand, LSAs may contribute to

economic development and poverty reduction by generating rural employment, enabling local farmers to access high-value markets, modern knowledge and technologies or by contributing to investments in infrastructure, schools, and hospitals as part of Corporate Social Responsibility commitments or through tax revenues (Deininger & Byerlee, 2012; Deininger *et al.*, 2011). At the international level, policy guidelines have been developed in recent years to encourage such responsible agricultural investments that contribute to poverty reduction and economic development (e.g., Committee on Food Security—CFS, 2014). The type of institutional arrangement is considered an important parameter in this context (Vermeulen & Cotula, 2010), with arrangements that create linkages with smallholder farmers, such as contract farming or outgrower schemes,<sup>2</sup> often considered most effective (Arndt, Benfica, Tarp, *et al.*, 2010; Deininger *et al.*, 2011).

In spite of the relevance for development and policy making, there is a paucity of empirical evidence on the welfare and poverty effects of LSAs (Deininger & Byerlee, 2012; Oya, 2013a). Existing studies have used ex-ante simulations to measure potential impacts, with Arndt *et al.* (2010) simulating large-scale biofuel expansions through jatropha or sugarcane production in Mozambique and Baumgartner *et al.* (2015) assessing the expansion of a rice investment in Ethiopia. Both studies suggest positive welfare effects, but more pro-poor effects if smallholders are integrated in the supply-chains. Deininger and Xia (2016) have recently used survey data of large-scale and small-scale farmers in Mozambique to study spillover effects. The authors find evidence of some spillovers to small-scale farmers in terms of adoption of farming practices, fertilizer and pesticides, but also negative impacts on farmers' subjective well-being.

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Hardly any empirical evidence exists on actual impacts through the most relevant direct participation channels, i.e., labor market channels via plantations and large-scale farming or product market channels via outgrower schemes. Research on labor market channels has focused so far on less land-intensive high-value horticulture export sectors in SSA, with some viewing these jobs critically because of their low quality and wages (e.g., Barrientos & Kritzing, 2004; Barrientos, Kritzing, Opondo, & Smith, 2005). The only study applying a more rigorous approach using a control-group comparison (Maertens, Colen, & Swinnen, 2011, on horticulture exports in Senegal), however, finds positive household welfare effects, with benefits especially occurring to poorer households. The existing literature on contract farming comes to rather mixed conclusions regarding household welfare effects. Whereas authors have noted the risk of exploitation of farmers (e.g., Little & Watts, 1994) and exclusionary processes (e.g., Porter & Phillips-Howard, 1997), a number of more recent impact evaluations mostly find positive household welfare effects for contract farmers (Bellemare, 2012; Bolwig *et al.*, 2009; Herrmann & Grote, 2015; Maertens & Swinnen, 2009; Rao and Qaim, 2011; Vaeth & Kirk, 2014; Warning & Key, 2002). The only two studies that analyze contract farming as part of a LSAI (nucleus-estate outgrower models) are Vaeth and Kirk (2014) on palm oil in Ghana and Herrmann and Grote (2015) on sugar in Malawi. In addition, only two studies compare the effectiveness of different participation channels, namely Maertens and Swinnen (2009) and Herrmann and Grote (2015), evaluating contract farming and wage employment in Senegal and Malawi, respectively.

The aim of this study is to contribute to the literature on the welfare effects of LSAIs by evaluating the household income and income poverty implications of outgrower schemes and estate/plantation and factory employment in large-scale rice and sugar investments in Tanzania. The analysis is based on cross-section data of sugarcane outgrowers, agro-industry workers (sugar and rice) and non-participants in villages surrounding two LSAIs in Kilombero District, Morogoro Region. The article is among the first that attempts to measure actual ex-post impacts of LSAIs, thus, contributing to filling the literature gap identified by Deininger and Byerlee (2012) and Oya (2013a). Moreover, it attempts to contribute to a better understanding of the heterogeneous effects of LSAIs because of differences in sub-sectors and institutional arrangements.

Rice and sugar in Tanzania are very interesting cases. Demand for rice and sugar has been increasing within and outside the region amid rising incomes and urbanization (Johnson & Sebaluck, 2012; Larson, Otsuka, Kajisa, Estudillo, & Diagne 2010). Both subsectors have been among the main targeted crops under LSAI proposals in SSA (LMGO, 2015), with Tanzania among the top three recipient countries, apart from Ethiopia and Mozambique (LMGO, 2015). Sugar and rice are considered priority sub-sectors in Tanzania's national strategies to develop commercial agriculture (United Republic of Tanzania—URT, 2013; Southern Agricultural Growth Corridor of Tanzania—SAGCOT, 2011). The case study area is within SAGCOT, a major public–private partnership initiative to attract agribusiness investments. The two investments have been referred to as best-practice cases for future SAGCOT investments (SAGCOT, 2011).

The article is structured as follows. Section 2 discusses the literature. Section 3 describes the context of agro-industry investments in Tanzania. Section 4 explains the data source and methodology, before Sections 5 and 6 present and

discusses descriptive and econometric results. Section 7 concludes.

## 2. LITERATURE REVIEW

This chapter summarizes existing literature on the effects of contract farming or outgrower schemes and employment linked to LSAIs. Contract farming may help smallholder farmers overcome their previous lack of access to credit, quality inputs, high-value output markets or know-how (Barrett *et al.*, 2012). Input market access, for example, can be facilitated if either (a) farmers use their output-contracts as collateral, (b) the output-contracts have inbuilt credit schemes (e.g., tri-partite arrangements with commercial banks) or (c) cash earnings are sufficient to buy inputs (Govere, Jayne, & Nyoro, 1999; Grosh, 1994). As a result of improved access to quality inputs, extension, and high-value output markets, producer prices and/or quantity may increase, leading to overall higher incomes. Yet negative welfare effects may also arise due to increased exposure to production and marketing risks from adopting a new crop and accessing previously unknown markets (Eaton & Shepherd, 2001; Simmons, Winters, & Patrick, 2005). Most problematic may be situations in which farmers face a single buyer, and relationship-specific investments are undertaken, potentially locking them in (Sivramkrishna & Jyotishi, 2008). Sugar, for instance, is an extreme case of monopsonic market relations, where usually a single processor sources from a large number of outgrowers with no alternative market outlet. Side-selling is made difficult due to the bulkiness and perishability of the crop, as well as legislation, which often creates regional monopolies.<sup>3</sup> At the same time, outgrowers may benefit from the processor's output market security if it creates incentives for the processor to invest in the outgrowers productive capacity, as side-selling risks are reduced (Glover, 1990; Tiffen & Mortimore, 1990). Some recent studies find positive participation effects of contract farming in terms of household welfare (Bellemare, 2012; Miyata, Minot, & Hu, 2009; Warning & Key, 2002), although there are a few exceptions (Narayanan, 2014; Simmons *et al.*, 2005).

The direct welfare effects of participating as wage laborers in LSAIs are more uncertain. As agricultural wage employment usually involves high monitoring costs, hired labor has usually been used for only simple low-paid tasks (Otsuka & Yamano, 2006; Oya, 2013b). Agricultural wage employment is therefore often argued to be performed by those households lacking the ability to engage in better paid non-farm or on-farm jobs (Davis *et al.*, 2010). Consequently, although it may be an important coping strategy against shocks, it is usually believed to add little to lift the poor out of poverty (Otsuka & Yamano, 2006; Oya, 2013b). There is some indication, however, that jobs in large-scale investments may have more significant effects, especially if foreign capital is involved, as in the cases analyzed here. Foreign firms may bring in capital, new ideas and technologies, thereby increasing worker productivity (Harrison, 1994). Paying higher wages may also be a strategy to increase efficiency or to retain productive workers (efficiency-wage hypothesis) (Akerlof & Yellen, 1986), or be a result of exposure to global consumer scrutiny (Oya, 2013b). Te Velde and Morrissey (2003), for example, found in manufacturing industries in SSA that foreign firms tend to pay higher wages than domestic firms. Some studies on agro-industries in SSA regarding foreign-owned firms (Cramer, Oya, & Sender, 2008, for Mozambique) or food

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