The impacts of large-scale land-acquisition in East Africa on poverty reduction and the rural economy

Studies in Ethiopia and Uganda

Philipp Baumgartner

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Center for Development Research
Zentrum für Entwicklungsforschung
University of Bonn

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Rheinische
Friedrich-Wilhelms-
Universität Bonn

THE IMPACTS OF LARGE-SCALE LAND-ACQUISITION IN EAST AFRICA ON POVERTY REDUCTION AND THE RURAL ECONOMY STUDIES IN ETHIOPIA AND UGANDA

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Pictures on cover: from top left clock-wise - all (c) P Baumgartner

1 - local Anyuak hut in savannah/light forest near Ethiopian investment site (Mar 2011)
2 - excavation of canal at main farm by Swedish construction company, Ethiopian investment site (Jul 2010)
3 - rice nursery site near Ethiopian investment site, harvested by local female workers (Jul 2010)
4 - casual workers working on big Ethiopian farm to prepare land (Feb 2011)
5 - small-holder operated rice fields on former swamp land in Bugiri, Uganda - near Indian investment site (Apr 2011)

1. Gutachter: Prof. Dr. Dr. h.c. Joachim von Braun
2. Gutachter: Prof. Dr. Gerhard Schiefer

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SUMMARY

There is an increasing interest of acquiring farmland abroad, especially following the food price crisis in 2007/08. East Africa is a hotspot of activities, and given the high prevalence of poor people in the area, impacts on rural livelihoods are expected to be substantial. Following significant primary data collection in Ethiopia and Uganda, the study analyses the impact of two such large-scale land acquisitions on the rural economy and the local population's livelihood, using *Theory-based Impact Evaluations* (Hemmer 2011) within an analytical framework of *layered social analysis* (Williamson 2000). Impact is assumed to manifest through five major channels: land, labour, natural resources, technological & organisational innovation and institutional change.

The study consists of five chapters: The *introduction* surveys the global trend, reviews existing evidence and relevant theory to elaborate a conceptual and an analytical framework for the research. The *second chapter* takes stock of trend and types of large-scale land acquisitions in Eastern Africa, using national official data from Ethiopia and Uganda. While there is a clear increase in number of land transactions, media reports are only confirmed in a small fraction. Investors are coming from Europe, the Arabic peninsula as well as other emerging economies in the global South (South Africa and India, specifically). However, a surprisingly large number of acquisitions is done by domestic investors.

The *third chapter* analyses the early stage impact of a large scale land acquisition in the far western lowlands of Ethiopia. A Saudi-Ethiopian investor tries to develop 10,000 ha for irrigated rice production. Building on primary household data and qualitative information gathered in the area in 2010, a mathematical programming model is calibrated to quantify likely impacts ex-ante. The investment is found to have poverty reducing potential, mainly due to employment creation and growth of the rural non-farm economy. However, the local population has to bear uncompensated costs of lost forestland and local inequalities are likely to widen in consequence of unequal participation on employment and business opportunities.

The *fourth chapter* examines a forty year old large-scale investment in Uganda to understand long-term impacts, especially regarding technological and organisational innovation, as well as institutional change. Using an institutional economic analysis, changes at the organisational structure of the investment can be related to broader changes in the surrounding rural economy, indicating the significant impact a LSLAs can have on rural transformation. Again, the investment has overall contributed to poverty reduction, but organisational flaws and the collapse of a contract farming scheme indicate the difficulties to govern the large farm well. The emergence of a land market for wetlands, adoption of rice as a new crop and organisational improvements among smallholders can be considered as major outcomes of the investment's activities.

The *fifth chapter* synthesises the early three empirical chapters and locates the findings within a broader set of trends regarding the commercialisation of the agri-food system, the discussion on optimal farm size for production and poverty reduction, and the importance of functioning land and labour markets for poverty reduction and rural transformation in developing economies.

ZUSAMMENFASSUNG

Seit der Nahrungsmittelkrise 2007/08 ist ein gesteigertes globales Interesse an großflächigen Landkäufen und –pachtungen zu beobachten. Ostafrika ist ein *hotspot* für solche Investitionen und angesichts des hohen Anteils an armen Menschen in dieser Region, werden gravierende Einflüsse auf die ländlichen Lebensräume und Einkommensstrategien erwartet. Die vorliegende Studie analysiert den Einfluss zweier großflächiger Agrarinvestitionen auf die ländliche Ökonomie und die lokale Bevölkerung, basierend auf einer *Theory-based Impact Evaluation* (Hemmer 2011) innerhalb des analytischen Rahmens der *layered social analysis* (Williamson 2000). Auswirkungen werden entlang von fünf Wirkungskanälen analysiert: Land, Beschäftigung, natürliche Ressourcen, technologische und organisatorische Innovation sowie institutioneller Wandel.

Die Arbeit setzt sich aus fünf Kapiteln zusammen: *Die Einleitung* untersucht globale Trends, existierende Evidenz und relevante Theorien um den konzeptionellen und analytischen Rahmen der Forschungsarbeit zu entwickeln. Das *zweite Kapitel* bilanziert Trends und Typen von großflächigen Landakquisitionen in Ostafrika, vornehmlich beruhend auf nationalen Daten aus Äthiopien und Uganda. Während eine deutliche Zunahme an Landtransfers belegt werden kann, können Medienberichte nur teilweise bestätigt werden. Investoren kommen aus Europa, von der arabischen Halbinsel, sowie aus einigen aufstrebenden Volkswirtschaften des globalen Südens (insbesondere Südafrika und Indien). Allerdings wird eine unerwartet große Anzahl von Akquisitionen durch einheimische Investoren getätigt.

Das *dritte Kapitel* analysiert die frühen Auswirkungen einer großflächigen Landakquisition im entlegenen Flachland in Westäthiopien. Ein saudisch-äthiopischer Investor versucht dort 10 000 Hektar Land für bewässerten Reisanbau zu entwickeln. Basierend auf Haushaltsdaten und qualitativen Informationen, die 2010/2011 vor Ort erhoben wurden, wird ein mathematisches Programmierungsmodell kalibriert und wahrscheinliche Auswirkungen werden ex-ante geschätzt. Das Großlandinvestment hat Potential armutsreduzierend zu wirken, vor allem durch Beschäftigungsentwicklung und Wachstum des ländlichen non-farm Sektors. Allerdings verliert die Lokalbevölkerung Zugang zu Waldland und muss die Kosten steigender ökonomischer Ungleichheit tragen, diesich in Folge ungleicher Teilhabe an neuen Beschäftigungsmöglichkeiten ergeben.

Das *vierte Kapitel* untersucht ein vierzig Jahre altes, großes Agrarinvestment in Uganda, um die langfristigen Auswirkungen, insbesondere hinsichtlich technologischer und organisatorischer Innovation und institutionellen Wandels, zu analysieren. Durch eine institutionenökonomische Analyse werden Veränderungen in der Organisationsform des Großinvestments mit Umwälzungen in den Strukturen der ländlichen Ökonomie rund um das Investment in Zusammenhang gesetzt. Es zeichnet sich ein bedeutender Einfluss des Investments auf die lokale Agrarökonomie ab. Wieder hat das Investment insgesamt zur Armutsreduktion beigetragen, aber Managementfehler und das Zusammenbrechen eines Vertragsanbau-Verhältnisses mit lokalen Bauern unterstreichen generelle Probleme der Unternehmensführung einer Großfarm. Zu den bedeutendsten Auswirkungen des Investments zählen die Entwicklung eines

Landmarktes für Reisland, die Einführung von Reis als neuem cash crop und organisatorische Verbesserungen der kleinbäuerlichen Produktion.

Das *fünfte Kapitel* fasst die vorrangegangen drei empirischen Kapitel zusammen und verortet ihre Ergebnisse im Kontext weiterer Trends des globalisierten Agri-Food-Systems, in der Diskussion über die „optimale Farmgröße" für Produktion und Armutsreduktion, sowie der Bedeutung funktionierender Land- und Arbeitsmärkte für Armutsreduktion und ländliche Transformation in Entwicklungsökonomien und Schwellenländern.

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ABBREVIATIONS

AISD	Agricultural Investment Support Directorate
AEU	Adult Equivalent Unit (Human being age 16 – 59)
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
CDC	Commonwealth Development Cooperation
CDE	The Centre for Development and Environment (University of Bern)
CFS	Committee on Food Security
CIE	Counterfactual Impact Evaluation
CIFOR	Center for International Forestry Research
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement (French International Research Centre for Agric. Development)
CSA	Central Statistical Agency (Ethiopian Government)
EEA	Ethiopian Economists Association
EIA	Ethiopian Investment Agency
FDRE	Federal Democratic Republic of Ethiopia
FDI	Foreign Direct Investment
FAO	Food and Agricultural Organisation of the United Nations
GTZ / GIZ	Gesellschaft für technische Zusammenarbeit / Gesellschaft für Internationale Zusammenarbeit
GIGA	German Institute for Global and Area Studies
GM	gen manipulation / gen-manipulated
HLPE	High Level Panel of Experts (CFS)
IIED	International Institute for Environment and Development
ILC	International Land Coalition
Ikub	saving group in Ethiopia (rotating system: one member can withdraw every week)
IFAD	International Fund for Agricultural Development
JICA	Japan International Cooperation Agency
LDC	Least developed countries
LP	Linear Programming
LSLA	Large Scale Land Acquisition
LSAI	Large Scale Agricultural Investment
MAAIF	Ministry of Agriculture, Animal Industry and Fishery (GoU)

MoARD	Ministry of Agriculture and Rural Development (FDRE)
MDGs	Millennium Development Goals
NAADS	National Agricultural Advisory Service (Uganda)
NGO	Non-Governmental Organisation
NIC	Newly Industrialised Economies
NIE	New Institutional Economics
GoU	Government of Uganda
PCA	Principal Component Analysis
PPP	Public Private Partnership
ppp	purchasing power parity
RAI principles	Responsible Agriculture Investment Principles
REDD	Reduced Emission from Deforestation and Forest Degradation
RNFE	Rural Non-Farm Economy
RSPO	Roundtable on Sustainable Palm Oil
SME	Small and Medium-sized Enterprise
TBIE	Theory-based Impact Evaluation
OECD	Organisation for Economic Co-operation and Development
PA	Peasant Association (formed in Ethiopia under the *derg* regime)
UIA	Uganda Investment Authority
UN	United Nations
WB	World Bank Group
WFP	World Food Programme

MEASURES

ha	hectare	1ha = 100m x 100m = 10,000m^2 = 2.47 acre
acre	acre	1acre = 0.4 ha
sqm	square mile	(~ 2589999 m^2 ~ 259 ha)
1 US$	= 2373 USHs	
1 US$	= 16.4 ETB (Birr)	

1 INTRODUCTION

The food price crisis of 2007–08 enduringly affected the global food system. Increased pressure on natural resources, water scarcity, as well as the imposition of export restrictions by major agricultural commodity producers while prices were high have resulted in distrust of global markets and forced countries that are dependent on agricultural imports to change their strategies to meet domestic demand. As a consequence, large-scale[1] acquisition and leasing[2] of farmland in developing countries have become increasingly frequent phenomena. Given the large shares of populations working in agriculture and the limited GDPs of many Sub-Saharan African (SSA) countries, these investments are playing an enormous role in their future development. In particular, East Africa as a region has been heavily affected, drawing investors from Europe (mostly private sector investors seeking high returns), the Gulf States (seeking food security for domestic markets), and Asian investors (mostly from India and China, seeking food and energy crops for domestic demand).

Potential Risks and Opportunities: Land acquisitions and leases have the potential to supply developing countries with much needed capital, contribute to the development of key infrastructure, and spread technological innovation. Considering that agricultural growth has a greater impact on poverty reduction than other economic sectors (World Bank, 2007), this trend can be viewed as very positive. However, the investments also bring significant risks for the recipient countries, especially for local populations that had user rights to the land for agricultural or pastoral activities prior to its sale or lease to foreign investors. In addition, these investments can contribute to corruption, unsustainable land use (land degradation, soil mining), water shortages, and negatively affect local food security.

I used a case-study approach for two East African countries to better understand the impacts of large-scale land acquisitions (LSLAs) and following large-scale agricultural investments (LSAIs) by foreign investors.[3] In particular, I examined the economic dynamics of these transactions and investments at the community and household levels to determine their significance to local land markets. I also analysed employment generation, the use of natural resources, as well as the

[1] I define 'large-scale' as areas of 500 ha or more. Deals concerning 10.000 ha or more are called ‘mega’.

[2] As leases are typically granted for several decades, the word acquisition will be used to signify both sales and long-term leases of agricultural land.

[3] A *LSLA* is defined as the transfer of ownership and/or user rights to the land, while a *LSAI* implies actual investment to transform the land use (e.g. irrigation and road infrastructure, land levelling, mechanisation, etc.).

spread of agricultural technology resulting from these investments. I conclude with a discussion of the future of this phenomenon and how governance could be improved to better serve poverty reduction.

1.1 Problem statement and existing evidence

1.1.1 Scale and drivers of commercial interest in acquiring of farmland abroad

Efforts to quantify the amount of land involved in these transactions on a global scale have initially relied on media reports.[4] In early 2009, von Braun and Meinzen-Dick listed media reports indicating a cumulative amount of more than 30 million hectares that were affected or under negotiation globally. Friis and Reenberg (2010) reviewed data from the International Land Coalition (ILC) and found that in Africa alone an area between 51 and 63 million hectares had been affected. The World Bank assessed media reports on the GRAIN blog and found that during 2008 and 2009, an area of 56.6 million hectares had been negotiated (Deininger et al., 2010). First reports by the Land Matrix stated that globally, about 227 million hectares had been under negotiation or transferred between 2001 and 2010. Out of these, 67 million hectares were cross-checked through triangulation until late 2011 (Anseeuw , Wily et al., 2012).[5]

In addition, a number of systematic assessments of national inventories have been carried out by the IIED/FAO/IFAD (Cotula et al., 2009), GIZ (Görgen et al., 2009), and the World Bank (Deininger et al., 2010). These figures are much more conservative than the media-based estimates. One explanation for this disparity is that inventories often list only approved deals, while media reports also include negotiations in progress. Some contracts allow future expansion, which is not yet noted in current inventories. Furthermore, access to comprehensive in-country data is not easy, as land concessions might be handled by different government entities (Cotula, 2012). Nevertheless, the early numbers reported by the media appear to have been over-estimated (see Chapter 2 for Uganda, and note the reduction of confirmed deals in the Land Matrix data between end 2012 and June 2013). As of September 2014, the Land Matrix reported a total of 35.7 million hectares of concluded deals, and a further 14.8 million hectares under negotiation. Failed efforts accounted for 7.5 million hectares. While there remain

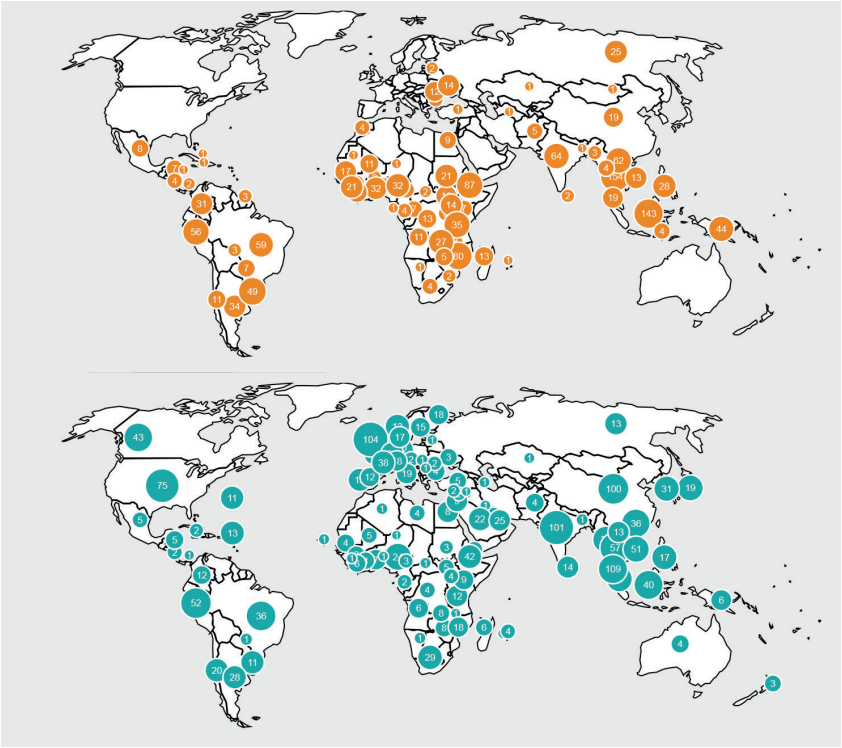
[4] While media attention has emphasized the role of international investors, national elites and domestic investors account for a greater share of transactions. However, national actors often fall below the radar screen of global-level studies because they are seldom regulated or facilitated by public agencies, and because individual transactions tend to be smaller (Cotula et al., 2009; Deininger et al., 2010; Hilhorst et al., 2011).

[5] The Land Matrix estimates include concessions for mining and timber, as well as investments for tourism (e.g. wildlife parks) and cover a broader range than the earlier two estimates. See also www.landmatrix.org (last accessed Nov 16, 2014).

methodological issues (e.g. media biases towards foreign investors), and the validation processes are not always transparent, this data is the most comprehensive quantification of the global scale of the phenomenon.

There is a wide range of countries leasing or selling land to foreign investors, ranging from Nicaragua, Peru and Brazil in Latin America, the DRC, Mali and Ethiopia in Africa, to Nepal, Laos, and Cambodia in Asia, and the Ukraine (Figure 1.1). Thus it can truly be considered a global phenomenon, however, most transactions are taking place in Africa.

Figure 1.1 Global extent of large-scale land transactions: target and investing countries according to the quantity of cross-checked agreements (October 2014)



Source: Land Matrix (2014); including all transactions ≥200 ha between Jan-2000 and Oct-2014. (above/orange = target country, below/blue = investor country); see also www.landmatrix.org.
Note: Data derived from media reports and validated by experts, local NGOs, government officials, etc. Accuracy has improved since 2010, but figures are considered approximations.

A number of factors have caused the sharp increase in foreign investment flowing into agriculture and large-scale farming since the mid-2000s. These driving forces can be divided

into demand and supply sides with respect to land, as well as changing incentives in the institutional framework of such investments. On the supply side, a number of stress-factors contribute to increasing pressure on land, which causes a re-valuation of this resource that may stimulate international investment: population pressure in many middle-income and developing countries in Asia leads to increasing land-scarcity, especially in India and China. This trend is further enforced through climate change and instability, as well as land degradation (Nkonya et al., 2011). Water scarcity motivates investors to seek opportunities abroad (Allan, 2012; Smaller & Mann, 2009). On the demand side, population growth plays a role too. Growing global demand for food and fodder is caused by: (i) an overall increase in global population as well as (ii) increasing income and accompanying changes in diet preferences (von Braun, 2010). In particular, the growth of meat consumption in the BRIC states drives demand for fodder and rangeland abroad. This is further enhanced through growing demand for biofuel in developed economies (Zommers, Johnson, & Macdonald, 2012). None of these drivers is expected to slow down significantly in the near future, making it likely that commercial pressure on land will remain high or even increase further. This leads to expectations of price increases, which motivate investments in land (with water).

Table 1.1 Drivers of large-scale land acquisitions through domestic and foreign investors

Increasing demand for farmland (*Demand-side*)	**Decreasing availability of farmland (*Supply-side*)**	**Institutional setting for investments / acquisitions of farmland (*Institutions/incentives*)**
Increasing **income** in middle-income countries and changing diets *-> food and energy demand*	**Population** increases in middle-income countries *-> land / water scarcity -> more imports needed*	Change in **investment policies** in many recipient countries in the global south *-> improved investment climate*
Global **population** growth *-> increasing demand for food, fodder and energy*	**Climate change** and climate **volatility** in producing countries *-> land scarcity / water scarcity*	**Land reform** and **liberalization** of land market (esp. in post-socialist countries) *-> allow transaction*
Food and commodity **price** spike of 2006–07 *-> increased commercial interest in food production*	**Land degradation** in producing countries *->land scarcity*	**Export ban** on main food staples during food price crisis *-> increasing interest of food-dependent countries to secure supply abroad*
Expectations of rising prices *-> securing supply*	**Population** growth in producing countries *-> land scarcity*	Legal changes in **portfolio / risk management** *->land as potential asset diversity strategy*
Less return on **conventional** investment **markets** (e.g. sub-prime mortgage crisis) *-> investors seek new opportunities*		**Active promotion** by recipient countries and relatively inexpensive (rental) prices for farmland *-> perceived low risk/start-up costs*
Domestic and diaspora accumulation of sufficient **capital** to invest *-> demand for farmland*		Preferential **trade agreements** with LDCs *-> motivation for foreign investors to produce in LDCs*
Carbon markets and REDD strategies *->incentives to acquire forest land*		

Note: author's compilation

Investments in large-scale farming have further been motivated by a number of changes in the institutional and governance framework over foreign investments and land transactions. Many host countries liberalised their land markets during the 1990s and early 2000s, or in the case of post-Soviet states, privatisation of land holdings allows foreigners to acquire long-term leases (sales are less frequent). Structural adjustment policies with a focus on market-driven development in many African countries make foreign investment feasible and more secure. This makes the investment environment more conducive, at least compared to past situations. However, four other factors have contributed to the growth in these investments. First, export bans by major grain producing countries during the food price crisis pushed governments of food-dependent countries to seek alternatives to meet the needs of their populations, which sometimes led to state-supported investment activities. Second, the subprime-mortgage crisis has driven investors to explore other opportunities with potentially high returns and farmland is perceived as such. Likewise, a change in the classification of asset classes made farmland more attractive for diversifying investment portfolios (Callan, 2012). In addition, the preferential trade agreements with Least Developed Countries (LDCs) allow investors in these countries to bypass import taxes in attractive sales markets, especially in the EU and North America. Finally, the governments of investment countries have often actively promoted LSLAs/LSAIs.[6]

While LSLAs of farmland are not necessarily a new phenomenon, the current trend has a number of characteristics that make it distinct: (i) the size of recent acquisitions often exceed 10,000 ha; (ii) investments are motivated by food and energy security, rather than efforts to reach economy-of-scale thresholds of large-scale production; (iii) a general lack of transparency and low levels of public consultation; and (iv) the governments of both investment and investor countries have been increasingly involved in the negotiations (at least in the early phase of the current investment surge) (Taylor & Bending, 2009).

1.1.2 Actors and locations of investment activities

On the demand side, three broad groups of actors can be distinguished. The *first group* includes investor country governments that, especially in the wake of the 2007–08 food crisis, are concerned about their ability to provide food security with existing domestic resources. The *second group* of actors are financial entities attracted by the profit potential of land-based investments. Despite the lack of liquidity and limited functionality of land markets, the potential future returns on land investments are rewarding enough to justify investing substantially in prospecting for under-valued arable land. The *third group* includes traditional agricultural or

[6] The invitation of Ethiopia's former president Meles Zenawi to the Indian prime minster Singh to "*come and farm our virgin lands*" is just one illustration (The Hindu, 2011, p. 1).

agro-industrial operators that have an incentive to scale up their operations or to integrate forward or backward due to the emphasis on advancing agro-processing and agricultural practices that favour larger-scale operations (Deininger et al., 2010). While early reports suggested that governments would sign lease contracts, in reality private companies are the main actors (Cotula et al., 2009; Deininger et al., 2010; Baumgartner, 2012).[7]

The phenomenon became popular in the media because foreign entities were acquiring farmland. In contrast to this perception, recent research has shown that the greatest share of investment deals involve domestic investors or the respective nation's diaspora (Anseeuw, Boche, et al., 2012; Baumgartner, 2012; German, Schoneveld, & Mwangi, 2011; Hilhorst, Nelen, & Traoré, 2011; Zoomers, 2010).[8] In addition, intra-regional deals have been frequently observed (see Görgen et al., 2009 for Asean; Hall, 2011 for Southern Africa; Visser & Spoor, 2011 for Eastern Europe & Central Asia). Nevertheless, many deals are transnational or transcontinental. In Africa, involvement by Middle Eastern countries, with the exception of Saudi Arabia, has been overstated (Cotula 2012). South Korea—apart from a publicised case in Madagascar in early 2009—has not been active in these efforts. Chinese investment activities receive considerable media attention and are listed in the Land Matrix database, and account for the majority of investments in the Mekong region. In Africa, however, hard evidence of Chinese investments in farmland is limited, with a few exceptions in Mali and Zambia (Bräutigam, 2011; Cotula, 2012). South Asian investors on the other hand seem to have drawn less attention, however, they have made major investments in East Africa (Hall, 2011; Rowden, 2011).

Initial findings indicated that land acquisitions are often part of complex packages that include infrastructure development; are predominantly leases in which governments have key roles; the main benefits to host countries are employment and infrastructure rather than directly financial (Cotula et al., 2009). Increasing commercial interest in farmland has prompted many African countries to establish 'land banks' of 'under-used' or 'idle' land that are presented to potential investors (e.g. Ethiopia, Zambia, Ghana and Tanzania) (Aryeete & Udry 2010; German et al. 2011; Baumgartner 2012). Initial evidence also suggests that Large-Scale Land Acquisitions (LSLAs) are not often integrated into broader rural development efforts (Büntrup, 2011).

In most East African countries, foreigners cannot own land. Thus, contracts are mainly between states, represented through federal or regional entities, and investors (Wily, 2010). In Africa a

[7] In Latin America private sector investments prevail, intra-regional companies and domestic elites play dominant roles, and investments typically occur in countries with relatively better governance (Borras et al., 2012).

[8] Domestic contractors often pair with international investors or acquire land on behalf of foreign partners. However, review of existing data revealed that the greatest share of deals involve domestic entities, while foreign investors tend to invest in larger tracts of land.

large share of contracts includes domestic or regional investors, or investors from the global South. Most investments appear to be legal (Hall, 2011), but the contracts between investors and host countries are generally concise and simple, and do not adequately reflect the complexity of the transactions (Cotula et al., 2009; Cotula & Vermeulen, 2010; Cotula, 2011). Frequently the former land users are not the legal owners (de jure).[9] According to legal prescriptions, local population and their leader often have to be consulted during the identification processes and the negotiation of investment deals. This is not always followed, and local leader, however, seem unable or unwilling to negotiate on the behalf of their communities (German et al., 2011; German, Schoneveld, & Mwangi, 2013; Nolte & Väth, 2013; Nolte & Voget-Kleschin, 2013; Väth, 2013).

Other authors relate investment activities to governance indicators. Zetland and Müller-Gulland (2012) found that most host countries perform low on a number of governance indicators.[10] Arezki et al. (2011) used a gravity model to identify how LSLAs are more affiliated with weak land governance and tenure security than favourable business environments. Thus, much early investment has been directed at LDCs and countries with weak institutional frameworks for hosting large-scale investors.[11] Zoomers (2010) underlines the geographic aspect of the increase in LSLAs and coined the term '*foreignization of space.*'[12]

Past experience with large-scale agriculture enterprise can provide some insight: Tyler and Dixie (2013) reviewed the economic and financial performance of 179 Agribusiness in Africa (122) and East Asia (57) to reflect on potential impacts of the current wave.[13] Their analysis focuses on investments from 1950–2000, and thus is characterized by a very different global

[9] Anseeuw, Boche, et. al. (2012) used Land Matrix data to show that while in the majority of cases for which information was available (56 out of 82) smallholder agriculture was the former land use, smallholders only had legal ownership of the land in 14 cases. The authors do not indicate the sizes of these projects.

[10] Zetland and Müller-Gullands' study suffers from a number of flaws, and the 2011 dataset used does not adequately reflect reality as discussed in Chapter 2.

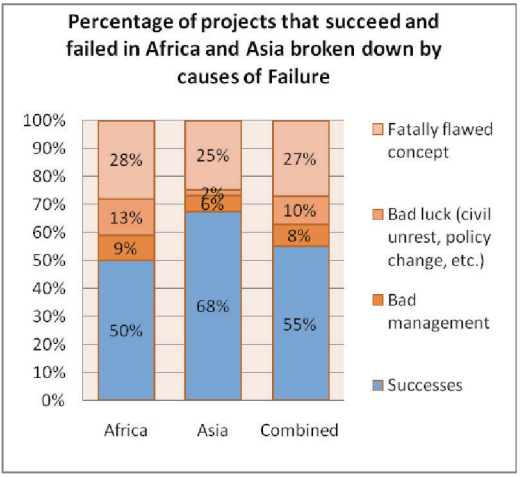
[11] The causal explanation suffers endogeniety problems, as weak institutions might be the by-product of low per-capita income, rather than the attraction among investors (see Khan and Jomo (2000)).

[12] Zoomers (2010) lists seven main drivers of the increasing commercial pressure on farmland: (i) foreign direct investment (FDI) in food production, (ii) FDI in non-food crops (biofuel), (iii) development of protected areas (ecotourism and carbon stocks), (iv) large-scale infrastructure works and urban expansion, (v) large-scale tourism complexes, (vi) retirement and residential migration (e.g. elderly move from North to South America), and (vii) land purchases in their countries of origin by diaspora.

[13] Of the 179, 131 were purely private sector/ profit oriented. The majority were plantations (SSA: 45 EA: 49%), followed by nucleus estates (SSA: 17%, EA: 32%), and out-growers (SSA: 12%, EA: 10%). Investments were mainly start-ups and targeted export. For more details see Tyler and Dixie (2013).

situation (lower prices, political turmoil—cold war, lower quality communication technology). The cases are agribusiness investments made by the Commonwealth Development Cooperation (CDC) and analysis focused on development impact, equity returns and financial viability. They distinguished four types of outcomes, fail (total or substantial collapse), moderate fail (some positive achievement, but far below plan), moderate success and success. The information was gathered from projects reports and interviews with CDC staff and other experts. Causes of failure in Africa and Asia were similar, mainly due to flawed design or bad management. In Africa civil unrest, market issues and government policies (lumped under 'bad luck') contributed to about 13% of projects' failures (Figure 1.2).

Figure 1.2 **Historical evidence of success rates and failures of large-scale agribusiness investments in Africa and East Asia, 1950–2000 (Tyler & Dixie, 2013)**



Note: Sample — 179 agribusiness investments in Africa and East Asia by the Commonwealth Development Cooperative during 1950–2000. Information gathered from project documentation and expert interviews.
Source: based on data from Tyler & Dixie, 2013, p. 7f.

Tyler and Dixie (2013) further discuss success rates and impacts based on type of agribusiness investment. Start-ups were much more likely to fail, than rehabilitation or extension of old schemes. Rehabilitation had big economic potential, but financial risk was high, especially in Africa. Nucleus estates with outgrowers accounted for most of the success cases, but for a limited range of industrial crops (sugar, tea, rubber and palm oil). Pure outgrower schemes were as successful as estate farming operations, but had a low track record for food crops (problems of side-selling). Their work, while with a certain limitation due to sample and source of information, is a fruitful addition to today's discussion. It confirms that investors take huge

financial risks, and in many cases the first mover might not succeed. In their sample, still 70% of the investments became sustainable businesses eventually. However, all cases were part of the CDC, which has higher quality and design requirements than many of the investments initiated in the years 2007–2010. Tyler and Dixie (2013) recommend to integrate smallholders into the business model, once the initial production and market risks are resolved, but do not discuss this as a factor contributing to or hindering the success rate.

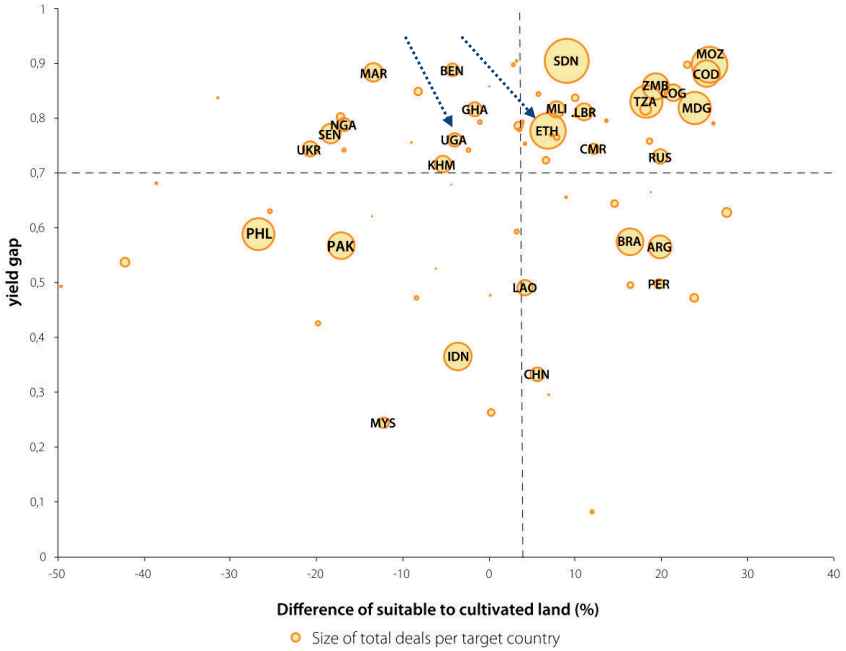
To systematize the new LSLAs, Deininger et al. (2010) suggested a *typology* depending on the availability of land and size of the yield gap, which can explain investor motivations as well as potential impacts on host countries.[14] Anseeuw, Boche, et al. (2012) tested that typology using Land Matrix data from December 2011 and confirmed its applicability (Figure 1.3).

- *Type 1: High yield gap, suitable land available*: Countries located in the upper right quadrant of the figure possess land for agricultural expansion and have yields that are far below potential. The majority of LSLAs reported occur in this setting (58% of the area transferred globally), and are located in Africa, especially East Africa.
- *Type 2: High yield gap, limited suitable land available*: The top left quadrant of the figure includes countries where smallholder farmer yields are far below potential yields, but land for expansion is very limited or not available at all. West African and Eastern European countries, as well as Uganda, account for the largest share. The entire group accounts for 13% of the land transferred.[15]
- *Type 3: Low yield gap, limited suitable land available*: This group (bottom left quadrant) accounts for 17% of the area transferred and feature the Philippines, Indonesia and Pakistan. Particular areas within these countries may be available for expansion and have attracted investors. In addition, yield gaps might not be uniformly low. Competition for cultivated land or arable land dedicated to other uses is likely in those countries.
- *Type 4: Low yield gap, suitable land available*: South American countries, especially Argentina and Brazil, as well as Laos and China are the main examples for this group. They account for 12% of the land transferred. Investors might be motivated by large tracts of land and relatively good investment climates, while efficiency gains from yield increases might not be easy to achieve.

[14] The yield gap is measured by comparing current yields and potential yields in a given location (i.e. technically feasible performance and effectively observed yields) (Arezki et al., 2011). Controversy exists regarding what is a realistic benchmark for 'feasible' yield. Similarly, the availability of land is difficult to measure. In a recent paper, Headey and Jayne (2013) discuss some of these difficulties.

[15] "*The limited availability of non-agricultural employment implies that potential productivity benefits from large-scale mechanized farming are likely to be outweighed by undesirable social and equity effects*" (Deininger et al., 2010, p. xvii).

Figure 1.3 **Typology of land acquisitions in relation to suitable available land and the yield gaps for main crops**



Source: Anseeuw, Boche, et al. (2012, p. 28)
Notes: Arrows indicate the case study countries. "The difference between the percentage of land area that is available (uncultivated) and suitable for cultivation, and that is actually cultivated, is given for each country on the horizontal axis. This is used as an approximate measure of scarcity of land. A positive value indicates that more land is suitable yet uncultivated than is cultivated. The vertical axis displays the yield gap. A high value indicates a high gap between potential and actual yields. The land acquired by foreign investors for each country is represented by the size of the bubble" (Anseeuw et al., 2012, p. 28). Yield differences were adopted from Arezki et al. (2011).

Using remote sensing data combined with information on 246 land deals recorded by the Land Matrix, Anseeuw, Boche, et. al. (2012) classified investments by land-cover types (Table 1.2). While only a small share of the reported deals (ca. 25%) had sufficient information to be classified, most deals were located in areas that were already under cultivation. However, these deals tend to be much smaller in size. The largest leased areas were on 'marginal' land or 'shrubland.' While this indicates that governments are likely to negotiate land that has not been intensively used prior to investments, these areas frequently support low-intensity uses (such as herding, etc.) and greater biodiversity than more developed areas. The relatively large share of investments in forested areas indicates a trade-off between commercial agricultural interests

and forestry (timber and non-timber forest products, environmental protection, and carbon sequestration).

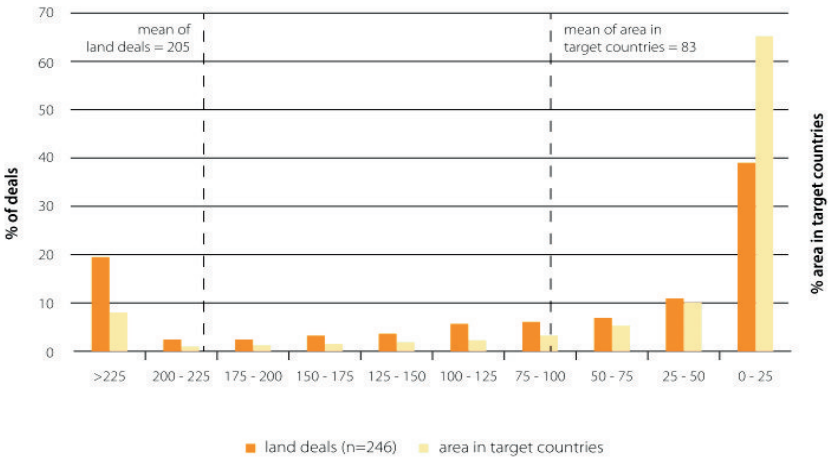
Table 1.2 Share of global land acquisitions by land-cover classes

	Cropland	Forest land	Shrubland/ grassland	Marginal land & other classes
Percentage of deals (N=246)	43%	24%	28%	5%
Percentage of area	22%	31%	17%	30%

Source: Anseeuw, Boche, et al. (2012, p. 32f), based on Land Matrix data (January 2012)
Note: Land cover classes are derived from Globecover 2009 and ESA 2010 (see Anseeuw, Boche, et al. (2012, p. 32f), for more details). A precise figure for the area assessed was not provided.

The trend of investments targeting areas with high yield gaps has also been confirmed by analyses of in-country data. For 236 cases with information available in the Land Matrix dataset, the mean yield gap was 0.71. The locations were not clearly directed to areas of low population density. Nearly 20% of the investments were located in densely populated areas (>200 people/km^2) and 60% were in areas above 75 people/km^2. However, there was an association between larger investments and less populated areas, with over 60% of the total area leased located in areas with less than 25 people/km^2 (Anseeuw, Boche, et al., 2012, p. 34f).

Figure 1.4 Distribution of land acquisitions by population density within recipient countries



Source: Anseeuw, Boche, et al. (2012, p. 36)
Notes: The vertical axis on the left represents the share of all agricultural land deals in a given population density class (measured as persons/km^2). The vertical axis on the right indicates the share of the combined area of all host countries that falls within the different population density classes.

1.1.3 Evidence from case studies

While a number of case studies on impacts of current large-scale investments has been presented a conferences, and in special editions of papers, and within a handbook (Allan et al., 2012), no systematic review or meta-study exists. FAO has published a bigger review with evidence from nine country cases around the world (Arias et al., 2012). Their review concludes rather sceptic, indicating that benefits from off-farm employment rarely out-weight costs. The report argues clearly that 'no one size fits all' and suggest therefore some principles, rather than precise design suggestions, for more beneficial investments. The review of FAO shows that these foreign investment projects that combine the strength of the investor (capital, management and marketing expertise and technology), with those of local farmers (labour, land and local knowledge) are more likely to yield mutual benefits.

LSLAs and the establishment of plantations can be a source of social conflict. A review of six case-studies from six countries by a research team of the Center for International Forestry Research (CIFOR) found that conflict was frequent and often severe. In Malaysia, where transfers were coordinated by the Roundtable for Sustainable Palm Oil, less conflict occurred. In five of the case-studies, conflict was due to distributional questions, mainly payment and compensation issues, as well as limited protection/respect of traditional use rights (German et al., 2010). In northern Uganda, conflict originated when domestic investors and elites took control of land for commercial agriculture (Mabikke, 2011).

There is a vast body of grey literature, mainly from NGOs, that reports conflict and violations of local user rights. These reports are sceptical of LSLAs and typically refer to them as 'land grabs.' While these cases should not be neglected, most of these studies lack the initial attempt to value the trends 'objectively'. Nevertheless, these reports help raise awareness of cases where investments negatively impact local populations. Generally these reports reflect valid local opinions and perceptions regarding investments, which are often shaped by frustration about the lack of consultation and meeting expectations (partly driven by unrealistic promises) (FIAN, 2010; Friends of the Earth, 2010; Mouseau & Sosnoff, 2011; Oakland Institute, 2011; Crabtree-Condor & Casey, 2012; Oxfam, 2012).[16]

Several case-studies reveal that negotiation processes between local communities and investors are decisive with regard to outcomes: "*Depending on how the actors 'play the game', land acquisitions can feature aspects of both 'land grabs' and of 'development opportunities'*" (Nolte, 2013, p. 4). Bues (2011a) found that water rights were re-allocated away from local users to support floricultural investment in Ethiopia due to pressure from investors. If local

[16] Labelling investors either as 'evil capitalists' depriving local user rights or 'benevolent donors' keen on supporting development betrays the limited objectivity of many sources (Lay & Nolte, 2011).

users are involved in negotiation processes, traditional authorities seem to have greater influence on the outcome of negotiations (Nolte & Väth, 2013; Nolte & Voget-Kleschin, 2013).[17] This relates to the importance of customary rights over individual plots and communal land, and the need to protect the legitimacy of these rights, especially if they are not legally protected (Goldstein & Udry, 2008; Lipton, 2009; Meinzen-Dick & Mwangi, 2009; Wily, 2010; German et al., 2013). Osabuohien (2014) showed for Nigeria, that LSAIs were directed towards low population density areas, with high amount of rainfall and leaders with comparatively lower education. His econometric analysis, however, is unable to reveal causality.

Large-scale plantations have often associated with deforestation. A recent review of six biofuel production sites by CIFOR supports this criticism. Oil palm expansion in Indonesia and Malaysia and soybean production in Brazil are illustrative examples (German et al., 2010).[18] Activities by both foreign and domestic investors increased deforestation in Western Ethiopia and negatively affected natural resource use among local communities (Shete, 2011; Baumgartner et al. 2013). Similar experiences have been reported in Laos and Cambodia (Guttal, 2011).

While several studies have identified the importance of linking land acquisitions to water rights (Smaller & Mann, 2009; Deininger et al., 2010; Keulertz, 2012), and legal mechanism are trying to address 'water grabbing' (BMZ, 2012; HLPE, 2011), little empirical evidence of the effects of LSLAs on water rights exist. One thorough case-study from Ethiopian highlands reveals that local users had less bargaining power than the domestic investor and thus continuously lost access and user rights to the existing irrigation system (Bues 2011a).[19]

An extensive review by CIFOR of the environmental and social impacts of biofuel production found significant positive income effects of plantation activities among all six countries. Only in one Indonesian case, plantation workers felt locked into wage labour conditions with such low pay, that no other livelihood could be pursued or invested in. Greater stability of income generation relative to food crop production was considered a positive development in many cases (Ghana, Mexico, Malaysia) (German et al., 2010).[20] Also Herrmann et al. (2013) found

[17] Case-studies in Sierra Leone also revealed that the role of local chief was very influential on outcomes.

[18] Other negative environmental impacts from plantations were air pollution, declining water quality, and soil erosion (German et al. 2010). Smallholder production of biofuels was also found to cause deforestation. Research in Zambia revealed that for every 1,000 ha of jatropha cultivated by smallholders 390 ha of mature forest and 196 ha of fallow land were converted.

[19] In their extensive review on LSLA trends Anseeuw et al. (2012), include a brief graph on the impacts on water use. According to their analysis foreign investments increase water consumption by 12.7% on average. However, they did not reveal the methods used to estimate water impacts.

[20] The overall conclusion of the study is more nuanced and identified many threats. The income improvements remained the primary benefit and were counterbalanced by the loss of customary user rights and high deforestation rates (German et al., 2010).

positive impacts on income, poverty alleviation, and asset accumulation of a large-scale investment in Malawi. In an analysis of two older investments in Zambia, Mujenja and Wonani (2012) report positive income effects, mainly through employment and technology transfers. Benefits to local communities are not necessarily equally shared (e.g. women benefitted less), and these gains are partly attributed to the fact that prior to privatisation over the past decades, these projects had a strong development component. In the last three African cases, several decades have passed since the establishment of the projects. Thus positive impacts might have needed a relatively long time to unfold. In a case-study analysis of an early stage project in Ethiopia, Shete and Rutten (2013) found that income and food security were negatively affected and that up to 30% of households faced problems meeting food requirements after having lost grazing rights on rangeland acquired by the investor.[21]

Other case-studies have found mixed outcomes. A study of an established palm oil investment in Ghana found that impacts changed with distance from the investment, origin of the head of household (migrant vs. local), educational level of household head, and integration into the economy (Väth, 2013). In that analysis, Väth underlines the importance of conceptualizing the 'action arena' (E. Ostrom, 2005),[22] where actors are 'playing the game' within the broader institutional framework. In Malawi Herrmann et al. (2013) found that impacts differed between sugar estate workers that were integrated vertically in the supply chain compared to sugar cane growers operating on their own land, who earned four to five times the income of the former group.

1.2 Conceptual framework of a LSLA's impact within the context of poverty reduction and rural development

1.2.1 Rural realities of smallholders are the ambience of large-scale investments

The very significant potential impacts on the rural economies of host countries, where absolute poverty and the shares of undernourished people and malnourished children are highest (Ellis & Bahiigwa, 2003; von Braun, Hill, & Pandya-Lorch, 2009; Haggblade, Hazell, & Reardon, 2010), makes the analysis of impacts highly relevant. The interaction with smallholder livelihoods[23]

[21] The project started in 2008. The analysis of the highland investment case underlines the potential problems of LSLAs in densely populated areas.

[22] See Ostrom (2005) for a discussion of the dependent variables that shape the *action arena* as the realm of possibilities for actors to negotiate their transactions (resource endowment, constitutional-choice, and collective-choice level).

[23] I follow the sustainable livelihood approach first conceptualized by Scoones and his colleagues at the Institute of Development Studies (IDS): "Given a particular *context*, what combination of *livelihood*

is the key transmission mechanism how LSLAs affect poverty reduction in host countries. Hence, it is useful to reflect briefly the everyday realities of these rural populations.

> *"Of the developing world's three billion rural people, over two-thirds reside on small farms of less than two hectares[24]; are nearly 500 million small farms."*
> (Hazell, Poulton, Wiggins, & Dorward, 2010, p. 1349)

Small farms are the backbone of food production and livelihoods of the majority of people living in developing countries. While in general, the importance of farming as a source of income might have declined, farming remains the 'platform' supporting a growing number of rural households (Hazell et al., 2010).

The importance of land to the livelihoods of rural populations cannot be underestimated (Lipton, 2009): "*Land is not only the primary means for generating a livelihood but often the main vehicle for investing, accumulating wealth and transferring it between generations. Thus the ways in which access to land is regulated, property rights are defined, and ownership conflicts are resolved have broad implications beyond the sphere of agriculture production"* (Deininger & Binswanger, 1999, p. 247). Land is a source of identity for many rural populations (Lund & Boone, 2013), and also acts as a safety-net if other sources of income are lost. Communal land is important, especially for the poor (E. Ostrom, 1990; Migot-Adholla, Hazell, Blarel, Place 1991; Place & Otsuka, 2000; Meinzen-Dick & Mwangi, 2009). Less intensive land use forms, such as herding and the collection of fruits and fuel wood often take place on communal or open-access land. These activities contribute to rural income, sometimes accounting for up to 40% (Sunderlin et al., 2005). Forest products act as the 'hidden harvest' for many rural people (J. E. M. Arnold & Pérez, 2001; Vedeld et al., 2007; Stellmacher & Mollinga, 2009).

Both, within countries as well as globally, the poorest are concentrated in resource scarce, marginal areas (Figure 1.5).[25] The livelihood strategies of the poor and extreme poor regularly rest on these natural resources, which are increasingly depleted (Barbier, 2010; Nkonya et al., 2011; Gerber, Nkonya, & von Braun, 2014). Since investments heavily target these marginal and remote parts, there remains a big potential impact through the effect of investments on natural resources, such as forest, rangeland and watersheds.

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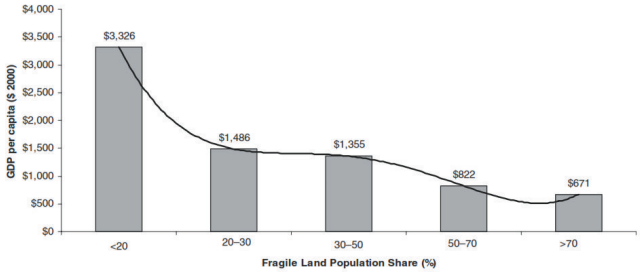
resources (different types of 'capital') result in the ability to follow what combination of *livelihood strategies* with what *outcome*?" (Scoones, 1998, p. 3).

[24] For discussion on holding size across different countries see Figure 7.17 (Appendix).

[25] This relates to the geographic dimension and 'biophysical causality cluster' of the marginality concept (Gatzweiler & Ladenburger, 2010; von Braun & Gatzweiler, 2014).

Figure 1.5 Percentage of population living on fragile land and GDP per capita in developing economies (2006 data)



Source: Barbier (2010, p. 639)
Note: Developing economies are all economies from East Asia and the Pacific, Latin America and the Caribbean, Middle East and North Africa, South Asian, and sub-Saharan Africa with 2006 per capita income of $11,115 or less, following World Bank data (see Barbie (2010) for more details on data). Number of observations = 90 countries, of which 12 (< 20% of population on fragile land), 27 (20–30%), 9 (50–70%), and 5 (>70%). The average GPD per capita (US$ 2000) across all countries is US$1,566 and the median is US$661.

Family labour remains the main source of labour for most agricultural production. Therefore family size becomes an important determinant of agricultural production for rural households. Family labour can be invested in on-farm activities to support production or off-farm activities to earn additional income (Binswanger & Rosenzweig, 1984; Herrmann et al., 2013). The LSLAs are expected to have impacts on household labour supply and demand directly through the generation of new employment opportunities, and indirectly through changes in wage levels and increasing labour costs etc. (Mano, Yamano, Suzuki, & Matsumoto, 2011; von Braun & Kennedy, 1994).

Technological change and innovation in agricultural production can significantly improve yields and food security (von Braun, 1988; Yamano, Otsuka, & Place, 2011; E. Rao, Brümmer, & Qaim, 2012). Innovation in smallholder productivity is seen as having the most potential for meeting increasing global food demand and increasing rural incomes (HLPE, 2013). However, adoption of new technologies and practices does not happen automatically, but is related to risk, potential gains, and farmers' knowledge about possible pay-offs (Admassie & Ayele, 2011). New production technologies and practices can affect the way farmers organise themselves and thus shape the institutional setting of rural economies (Kersting & Wollni, 2012).

Rural economies in most developing countries are characterised by weak, incomplete, or failing markets (Binswanger & McIntire, 1987; Binswanger & Rosenzweig, 1984; De Janvry & Sadoulet, 2006; Stiglitz, 1989); e.g. formalised markets for land are mostly lacking and state-dominated. The functioning (or inability to function) of rural institutions, however, has strong

implications for poverty reduction in rural areas. Applying institutional economics to rural settings, thus, can deepen understanding of aspects that neo-classical analyses find difficult to assess, such as institutions, organisations, collective action and power relations (Kherallah & Kirsten, 2002; Williamson, 2000).

Rural factor markets should lead to greater resource allocation efficiency. Exchanging parties gain from this trade. However, in rural settings households may opt out of market participation. "*Market participation choices revolve around the tension between gains from specialization and corresponding increases in transactions costs that result from depending more on the market to procure one's needs*." (Barrett, Carter, & Timmer, 2010, p. 450). The transaction costs are determined by the social distance from the counterpart and the economic distance from the trading point. Linking the rural areas of developing countries with urban sectors remains a key challenge in many parts of the developing world.[26] 'Growth-linkages' have huge potential for employment generation, transformation of agricultural sectors and poverty reduction (Haggblade, Hazell, & Brown, 1989). However, functioning linkages do not emerge easily and it is to be seen if/how LSLAs contribute to their creation and who will be able to benefit.

Costmary and informal property rights govern land use and inheritance rather than formalised property rights (Boone, 2013; Migot-Adholla et al., 1991; E. Ostrom, 1990). Complementary markets (i.e. for credit, insurance or labour) are poorly developed. Credit markets suffer from information asymmetries and often moneylenders are the only source of liquid capital (Hoff & Stiglitz, 1993). The supply of modern agricultural inputs is therefore not only constrained by infrastructure but also by the lack of liquidity of local farmers. The emergence of LSLAs and resulting increases in employment and cash-income could change this. LSLAs are also likely to affect the *de facto* and *de jure* institutional setting of rural economies.[27] This is especially relevant for land governance and its enforcement. Land tenure in most parts of Africa is highly complex, consisting of a web of overlapping property rights (Bomuhangi, Doss, & Meinzen-Dick, 2011; Meinzen-Dick & Mwangi, 2009). Furthermore, women face particular

[26] Research from China and India show that the difference between rural and urban per capita income is still significant with ratios of 1.5:3.5 (von Braun, 2006). Infrastructure remains key to allowing resources to flow from rural agricultural areas to the sectors closer to urban centres.

[27] (E. Ostrom, 2005, p. 3) defines institutions as "*[…]the prescriptions that humans use to organize all forms of repetitive and structured interactions including those within families, neighborhoods, markets, firms, sports leagues, churches, private associations, and governments at all scales*." The main challenge in understanding how institutions work, is the complexity and diversity of everyday life across space and time.

difficulties in acquiring (and maintaining) rights over farmland.[28] Prevailing land laws and customs penalise them twice: as daughters with regard to inheritance and upon the death of a spouse. In both cases the rights of sons tend to have priority over widow or daughters rights (Agrawal & E. Ostrom, 2001; Lipton, 2009; Stellmacher, 2007a). This is problematic, both for equity issues and efficiency.

1.2.2 Poverty and well-being

The most widely used poverty indicator is living on less than 1.25US$/per capita per day (in 2005 purchasing power parity terms) (Ahmed, Hill, & Wiesmann, 2009).[29] In a very broad sense this poverty line defines the level of income below which a decent standard of living is impossible. More broadly, two interconnected views on well-being can be distinguished. The first perceives an individual as capable of *doing* things and thus entails aspects of choice, freedom and self-determination. The second view looks at satisfaction and thus emphasizes the state of *being* (Dasgupta, 1990). Thus, poverty can be understood as being deprived of the freedom to do things (*negative freedoms*), or a deprivation of satisfaction to an extent that the being is threatened (e.g. hunger or ultra-poverty).[30] In addition, poverty is a *dynamic* state where households temporarily fall into poverty due to random events or shocks (Carter & Barrett, 2006).

Poverty tends to be especially aggravated in remote areas (Ahmed, Hill, Smith, & Frankenberger, 2009; Dasgupta, Laishley, Lucas, & Mitchell, 1977; von Braun & Gatzweiler, 2014). The concept of marginality underlines that ultra-poverty can be conceptualised as a function of assets, design (structures, processes and capabilities), and distance from a desired stage (economically, politically, geographically) (Gatzweiler & Ladenburger, 2010; Gatzweiler, Baumüller, von Braun, & Ladenburger, 2011). For example, in Ethiopia a strong correlation between extreme poverty and remote location of households was confirmed by Abebaw and Admassie (2014). Conceptually the root causes of extreme poverty can be distinguished in a 'biophysical causal cluster' and a 'socio-economic causal cluster' (von Braun & Gatzweiler, 2014).

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[28] Place et al.(1994) distinguish three key components of tenure security: (i) *Duration*: a sufficient time horizon to reap the benefits of investments; (ii) *Breadth*: number and strength of the bundle of rights; and (iii) *Assurance*: institutional setting that enables enforcement of rights.

[29] In addition to the 'dollar-a-day' poverty line, there exists a line of 0.50US$/ day that defines *ultra-poverty*. Ultra-poverty is a condition in which an individual is assumed to be unable to sustain their physical health. A look below the 1.25 US$/day line reveals the variable global progress in poverty reduction and among groups of poor (von Braun et al., 2009).

[30] This first view will be useful in judging the potential emancipating effect of a large-scale investment (e.g. through the creation of employment opportunities). The second is more applicable when looking at the change in poverty levels expressed by income or other indices.

In addition, being poor, or feeling one-self deprived of certain opportunities *reinforces* poverty: a household's income generating activities may be conditioned by the assets at their disposal (Babulo et al., 2008; Tesfaye, Roos, Campell, Bohlin, 2011). Poverty may be the result of *aspiration* failure[31] and can become a reason for lack of investment.[32]

1.2.3 Five impact channels

For my analysis, I identified five main impact channels through which the LSLAs are likely to affect the livelihoods of local population (Figure 1.6). First, LSLAs affect the availability and value of production factors: (i) The distribution of land is affected as land is allocated to the investor. At the same time, or partly as a consequence, the value of land might change. If land becomes scarce, prices are expected to rise. However, if farmers switch livelihoods to wage employment and cultivate less land, values could also decrease. (ii) Second, demand for and supply of labour might change significantly within the region. LSLAs are likely to create new employment opportunities and effect local wage levels. Depending on hiring mechanism and skill levels required, access to these new job opportunities will differ among segments of the local population. (iii) Furthermore, investments are likely to affect local access to and use of natural resources. This might happen through direct transfer of forest or grazing areas to the investors. Forest products might also be substituted by other goods, or demand for locally produced goods (derived from forests, such as fuel wood) might increase.[33]

(iv) In addition, investments can introduce new technologies, crops, practices etc. that might (or might not) be adopted by locals and improve their productivity. Furthermore, the organisation of production will be affected as new opportunities arise and local producers adjust their production and find ways to interact with the investor (e.g. out-grower arrangements). (v) Finally, institutions are likely to be affected by investments in two ways: First, the investment or supporting policies might affect the *de jure* and *de facto* rights of local users regarding land use, etc. Second, the property right regime might alter and markets for in- and

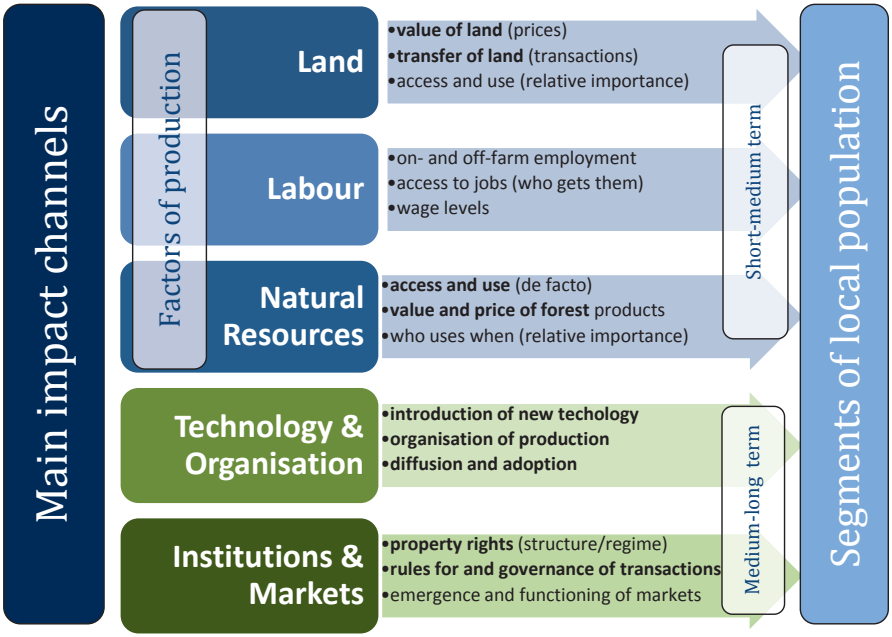
[31] *"More specifically, poverty may lead individuals to construct mental models that uniquely diminish the significance of some features of the environment and magnify others. If an individual believes that she has little, if any, ability to impact on her wellbeing, then she would have inadequate incentives to become informed about or explore pathways into better wellbeing"* (Bernard, Taffesse, & Dercon, 2008, p. 5).

[32] Ravallion (2013) discusses the origins of anti-poverty policies. The idea of fighting poverty is relatively new. Only in the 18th century did writers begin to recognise poverty as a social problem and theoretical approaches gained importance only after the great depression in the 1930s.

[33] These first three channels can be considered as the impact on factors of production. In classic economic theory the three factors of production would be labour, land and capital. I decided to not consider capital markets directly, but given the importance of natural resources, they can be seen as a partial substitute for capital in many rural areas.

outputs might emerge/change (e.g. if markets for land become established). In that sense, LSLAs influence the rules of existing rural economic systems.

Figure 1.6 **Conceptual framework of the five main channels of large-scale land acquisitions' impacts on segments of local population**



1.2.4 Research questions

Based on this conceptual framework and above literature review the following three core areas of research have been identified.

Q1: What is the **extent of** the recent interest in large-scale land acquisitions? **Who** are the investors and **what types** of investments prevail?

Q2: How do these investments affect **poverty**, and through what **channels** (direct and indirect)? How are costs and benefits distributed among those affected by investments (**distribution**)?

Q3: Which **institutional arrangements** govern these investments? How are the institutional that govern production locally affected by the emergence of large-scale land acquisitions?

1.3 Analytical approach, research design and case selection

1.3.1 Layered approach, complexity and researcher's ontology

Following Williamson (2000), I distinguish four layers of social analysis.[34] The top layer is *social embeddedness* (i.e. the layer of norms, customs, traditions, etc.). This layer basically hosts what North coined 'informal institutions, for which change is slow, normally occurring only over centuries or millennia. For most institutional economists and in my analyses, this layer is understood as exogenous.[35]

The second layer is the *institutional environment*. This is where the 'formal institutions,' such as constitutions, laws, property right regimes, etc. are located. These institutions are partly the result of evolutionary processes, but can also be shaped and designed. Such design elements include executive, legislative, judicative and bureaucratic functions, as well as federal distribution of power across different levels (Williamson, 2000). However, opportunities for actively designing these institutions are rare and might only occur at 'defining moments,' after a period of war or crisis, or because of perceived threats.[36] One core element of this second layer is *property rights* which define current user rights, as well as future use and distribution of rents created through their use (Khan & Jomo, 2000).[37]

The third layer of social analysis focuses on *institutions of governance* and explores how transactions by or within firms, groups of individuals etc. are aligned with governance structures and formal institutions. While the assertion of property rights remains important at

[34] If a phenomenon has a layered structure, one problem that arises is coherence of theories. The different theoretical concepts to explain phenomena at multiple levels and different spatial and temporal scales do not necessarily scale up or down (E. Ostrom, 2005, p. 12f). I address this point in the synthesis chapter.

[35] In the literature there is a vast discussion on how these long lasting informal institutions emerge and change over time. Williamson further underlines their 'evolutionary origins.' They might have emerged spontaneously or been adopted because of functionality, or symbolic value for a critical share of true believers, and often they are linked with complementary formal or informal institutions (Williamson, 2000).

[36] The end of World War II or the breakdown of Eastern Europe and the former Soviet Union are examples. Since we still understand little about the complex interplay of different types and layers of institutions, the orchestrating after such events often results in failure, such as the example of privatisation in the former Soviet Union.

[37] The nature of existing property rights regimes defines the (legal) mechanisms, which define property rights and mitigate conflict, solve disputes etc. For much of the economics of property rights, once these rights are defined and enforcement is assured, the government steps aside and 'free market transaction' leads to optimal allocation of resources (Alchian & Demsetz, 1972; De Soto, 2000). While bringing property rights to the forefront has clear merits and underlines their importance, this view overstates their capacity by making strong assumptions regarding costless enforcement and symmetry of information, as well as disregarding the role of 'private ordering' in many business transactions (Stone, Levy, & Paredes, 1996). In that way, it is important to look beyond 'the rules of the game' (property) and include 'the play of the game' (contract) (Williamson, 2000).

this level, the assumption of costless enforcement through perfectly working legal systems and a fully informed enforcer are abandoned and the fact that "*[...] much contract management and dispute settlement action is dealt with directly by the parties - through private ordering*" is recognised (Williamson, 2000).[38] The governance of transactions tries to establish order, and thereby resolves conflict and achieves mutual gains.[39] Consistent with this argument, transaction cost economic analyses displays its strength. Going beyond ex-ante analysis that looks at how individuals align their behaviour (transacting) with changing incentives (rules of the game), it focuses on *adoption* and *economic organisation* after incentives have changed (ex-post).[40] The way economic agents organise themselves and thereby react to changing incentives becomes central. Such change occurs over seasons or decades, and often at the moment of contract[41] renewal.

The fourth level of *resource allocation* has to be distinguished from such institutional and governance analysis. It is at this level where neoclassical optimisation is applied. Often marginal analysis is used and the firm (or farm) is perceived as a production function (Williamson, 2000). Actors are believed to react to changing incentives/prices according to their maximisation behaviour. An increasing amount of literature has improved this level of analysis, incorporating behavioural aspects, such as risk aversion, information costs, etc.

A note on ontology and epistemology in economics: Any research has the objective to reveal characteristics of reality. Scientists use 'mental models' and analytical techniques to improve knowledge about the object of interest (Mollinga, 2010; World Bank, 2015). *Ontology* is the study of the nature of reality. *Epistemology* is the study of the way this reality can be known. In that regard, epistemology can be defined as the philosophical relationship between reality and the researcher who tries to gain knowledge about that reality (Figure 1.7). [42]

[38] The analysis can take the institutional environment at layer two as given or assume direct feedback, (e.g. through lobbying, etc.). *Transaction* becomes the key variable of analysis at this level. A transaction can be further sub-divided into the three principles of order, conflict and mutuality (Williamson, 2000).

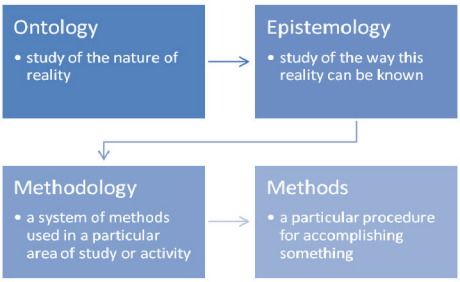
[39] Since there exists, not one single law, but multiple laws, and since most transactions are not simple but involve complex aspects such as quality, time, etc., at this point the incompleteness of any contract should be accepted. In other words, no contract can account for everything.

[40] See Williamson (2000) for further discussion, including references made to earlier work by Chester Barnard and Friedrich Hayek.

[41] As discussed above, a contract is not limited to the form of a written document, but encompasses any agreed upon regulation regarding a transaction by two or more parties. It can be oral, written, etc.

[42] Making clear what approach is used allows for cooperation across disciplinary boundaries: "*[E]xploring the ontological assumptions underpinning specific enquiry [or method] may reveal how disciplinary boundaries could be broken down and thus act as a precursor to interdisciplinary social science, of which economics could* (and should) *be a part*" (Downward & Mearman, 2006, p. 78).

Figure 1.7 **Causal relation between ontology, epistemology, methodology and applied methods**



Source: author's creation, adopted definitions from Mollinga (2010) and Lawson (1997).

Positivism is probably the leading ontology in economics. Its subscribers assume that there is a single, external and objective reality that corresponds to any research question (Hudson & Ozanne, 1988). They take a controlled and structured approach in conducting research, which includes the identification of a research topic, the formulation of precise research questions and underlying hypotheses, and the adoption of appropriate research methodology and thereafter methods. Positivism, in line with Popper (1963), supports 'deductivism' as the main approach to scientific inquiry (Lawson, 1997). In that sense, deductive reasoning links premises with a conclusion. If all premises are found to hold true, the conclusion is *necessarily* true.[43] In their approach, positivists detach themselves from the research object to remain objective and emotionally neutral. This underlines the clear distinction between science and personal experience. With the goal of reaching temporal and context free generalisations, positivists rely on structured research techniques such as econometrics or mathematical techniques to uncover 'objective realities.'

A very opposing ontological view is postulated by proponents of *interpretivism,*[44] who argue that there is no single reality. As there can be more than one reality, several structured ways of accessing knowledge about this reality exist. In their view, reality is always interpreted by the researcher: during the stage of data collection a researcher interacts with assistants and informants that translate the local reality. During analysis, the researcher uses codified techniques that render or translate data into information and findings. The interpretation depends on the personal 'set of meanings,' i.e. what a researcher believes about reality. Approaches used by *interpretivists*, follow *inductive reasoning* (i.e. general propositions are

[43] A simple example is the following: 1. All human beings are mortal. 2. I am a human being. 3. Therefore, I am mortal.

[44] It reaches back to ideas of Max Weber and Georg Simmel (*verstehen* sociology).

derived from specific examples). *Induction* only allows probabilistic conclusions. It differs from deductive arguments, by allowing the possibility that the conclusion is false even if all premises are true.[45]

Realism is the belief that there exists one reality, which is independent from our concepts of it. Thus, realists postulate that our understanding of reality can only be an approximation, but every new observation brings us closer to the objective reality. Theories can describe the reality and make predictions, but their fit depends whether the entities are correctly described by the theories (Lawson, 1997). For certain dimensions of social science, adequate description and measurement is feasible, and thus deductive approaches generate a good approximation of reality. For other dimensions, more inductive approaches and the interpretation of data generated that way may be the best way to identify general patterns.

A note on complexity and systems approach:[46] Systems can be broadly divided into ordered and non-ordered systems. Ordered systems follow an underlying logic.[47] Non-ordered systems can be complex or chaotic. In the former, relationships between cause and effect can only be explained ex-post, as a number of repercussions and the factor of agency make outcomes impossible to predict. Chaotic systems do not allow prediction.[48] Thus, I distinguish four system domains which are non-sequential in logic terms: (i) *simple*: cause and effect relationships are repeatable, perceivable and predictable, (ii) *complicated*: cause and effect are separated over time and space, (iii) *complex*: cause and effect relationships are only coherent in retrospect and do not repeat, and (iv) *chaotic*: cause and effect relationships are not perceivable (Koskela & Kagioglou, 2005; Snowden & Boone, 2007).[49]

[45] For an overview of the ontological and epistemological differences of these paradigms see Table 7.1 in the Appendix.

[46] I am not trying to revise the existing and growing literature on the research of complexity. I simply found it useful to reflect on how a researcher can grasp complex contexts. In that regard, a systems approach as developed in management studies can be fruitful for selecting appropriate research methods (e.g. Snowden and Boone 2007, Snowden 2010).

[47] This can be a simple command-reaction chain, or a more complicated mechanism, such as command-choice-reaction, where determinants of choice would needed to be explored (through analysis) to understand reaction.

[48] A practical example is weather. The weather of this moment can be considered as a simple domain: I see clouds that explain the rain, or shade. The forecast of weather over the coming days is a complicated system that requires analyses of different factors to predict or understand outcomes. Weather forecasts for the next month are complex and we can only explain the outcome ex-post.

[49] This is referred to as the *Cynefin Framework,* which is an analytical decision-making framework that recognises the causal differences that exist between system types (Snowden, 2010). While the primary use of management study frameworks is for decision makers to locate themselves in one of the domains before making a decision on how to move ahead, it helped me to justify the methodology and analytical approach chosen.

In simple and complicated systems the underlying mechanisms between cause and effect can be traced. In the simple system, they are already known or easy to understand, while for a complicated system deliberate research and analysis are required to finally deconstruct the underlying order and make the causal relationship explicit. *Complexity*, on the other hand, is a system without immediate causality. It is a system of constraints on agents, but agents modify the dynamic system, leading to an '*emergent order*,' that is only understandable ex-post (Snowden, 2010; Snowden & Boone, 2007).

1.3.2 Impact evaluation in economic research

Impact evaluation seeks to identify, quantify, and investigate causal relationships associated with change in a certain situation that is assumed to result from an intervention or program. I use the following definition: "*Impact evaluations are studies that measure intended or unintended changes at the higher outcome level and at the impact level, which are directly attributable to the intervention under consideration. These changes have to be identified and measured according to certain evaluation standards, the most important being the independence of the evaluator*" (Hemmer, 2011, p. 7).[50]

For any impact evaluation, the attribution problem remains the main challenge. In other words, the question of "what would have resulted without the intervention" is most difficult to answer. This problem is mainly caused by the complexity of several activities occurring simultaneously. The attribution of an outcome to one of these activities becomes more complicated with, (a) a greater number of activities involved and (b) the higher the level at which the outcome is measured (i.e. farther along the impact-chain).

There exist two streams of impact evaluation: a first stream with a counterfactual and a second without a counterfactual. The first can be classified as a way of looking at *if* there was a change due to the intervention, while the second is more theory-based and tries to answer *why* or *how* the change occurred. Following Hemmer (2011), I refer to the first as *counterfactual impact evaluation (CIE)*, and the second *theory-based impact evaluation (TBIE)*. CIE is better suited for *simple* systems and TBIE for *complex* interventions.

Within the study presented here, I used a TBIE, as due to the complexity of the impact channels and the problem of lacking baseline data, no meaningful counterfactual was available.[51] I relied

[50] This definition encompasses the relevant elements, namely (i) measuring changes at (ii) different levels and (iii) attribute them to an intervention, according with certain (iv) methodological standards and conducted by (v) an independent evaluator.

[51] Proponents of TBIE underline its capacity to reveal the *process* of change, which makes it more relevant for policy design. "*I advocate a theory-based approach to impact evaluation design, as this is*

on alternatives to statistical counterfactual, which mainly use *mixed method approaches* that are often combined case-studies with a synthesis of available quantitative data. Thereby the qualitative data allows insight into the process and impacts, while the quantitative data ideally ensures that results are representative[52] and allows extrapolation of the findings to other populations (V. Rao & Ibáñez, 2005; V. Rao & Woolcock, 2003).[53] In that sense, the 'rigor' of an analysis is not necessarily related to a particular method, but concerns the appropriate 'fit' between the nature of the problem and the method(s) used to scrutinize it under given constraints (temporal, political, financial, ethical, and logistical).[54]

1.3.3 Case selection

While an increase in the number of transactions of large areas of agricultural land could be observed globally, East Africa stands out with an especially high number of transactions and a large share of the land area transferred (Anseeuw, Boche, et al., 2012).[55] Ethiopia has attracted much media attention with publicly inviting investors, making land relatively cheap and easily available since 2008. An estimated 1.4 million hectares of land have been transferred to foreign and domestic investors since in Ethiopia between 2006 and 2011 alone. The current Ethiopian government only opened the agricultural sector to foreign investments in the past decade (Dessalegn, 2011).[56] It is also a country where investors started operations relatively soon after signing the contracts, thus allowing for analysis of early impacts on the ground. Uganda, on the other hand, is a country which has a longer history of private-sector led agricultural development with a number of large-scale farms that date back to past governments and in

most likely to yield policy insights. Academics need to engage in these real world issues and debates if their work is to help alleviate the plight of the world's poor." (White, 2007, p. 2)

[52] A selection bias occurs when unobserved characteristics that are simultaneously correlated with participation in the intervention and the impact indicator under examination (Hemmer, 2011, p. 20f). Such a bias may occur in a setting where participants are pre-screened or can decide whether to participate in the intervention or not. Randomisation does not remove the selection bias, but 'balances' it between the treatment and the control group, which statistically minimises possible distortions of the empirical findings. For a detailed decision-making tree on how to overcome selection bias in impact evaluation see Figure 7.4 in the Appendix and White (2007).

[53] To ensure external validity a sample should be randomly drawn from the target population. This also holds true for experimental design (Khandker, Koolwal, Samad, 2010, p. 34f).

[54] Several authors promote mixed-method approaches (e.g. Olsen, 2004; V. Rao & Woolcock, 2003).

[55] Despite the deficiencies of the Land Matrix data and having been partly involved in validating its data sources for East Africa, I use it as a point of reference, as it is the most reliable source globally. Issues of media bias towards Africa as well as misreported figures and status of transactions are further discussed in Chapter 2.

[56] Past foreign investments were typically directed towards manufacturing and processing, but not necessarily agricultural production. Since the early 2000s, the government changed its focus from smallholder based agriculture, issued legislation to attract investors, and privatised older state companies (Dessalegn, 2011).

some cases to colonial times. Nevertheless, Uganda was often identified as a country providing a significant share of its farmland to foreign investors. In a review of land deals, Friis and Reenberg (2010, p. 22f) state that Uganda has already leased out or negotiated up to 14% of its agricultural land.[57] Due to: (i) the relevance of the topic in these countries, (ii) the availability of local research partners, and (iii) the feasibility of conducting field research at the local level, I selected these two countries as case studies.

The investigation of case-study countries reveals how context specific characteristics have shaped outcomes. Such in-depth analysis should also facilitate drawing general insights and hypotheses that modellers can formalize or econometricians test.[58] Prior to selecting the case study investment projects, a list of media reported and officially declared projects was assessed with regard to whether projects were operational and accessible. The main criteria for selection were that projects: (i) are significantly large (>500 hectares), (ii) foreign owned, and (iii) already implemented. Secondary criteria included that investment projects: (iv) involve food crop production, and (v) being a green-field FDI for the early stage investment, to avoid impacts of past project forms (such as in the case of privatisation of state farms, etc.).[59]

Based on these criteria a number of LSLAs in Ethiopia were shortlisted, including the Karaturi project and the Saudi Star investment in Gambela, a region with much recent investment activity but little history of commercial farming. I ultimately selected the Saudi Star project due to the management's willingness to support my field work.

In Uganda the situation was more difficult. Much information on recent foreign investments proved to be either false or premature, thus did not qualify. One large-scale project on Lake Victoria (BIDCO/Palm Oil Uganda) was considered. Ultimately I selected the Tilda Rice Company PLC for its suitability for comparison with the Ethiopia case study (both cultivate rice for export), exhibiting medium- and long-term impacts, especially with regard to technological spill-over and the organisation of smallholders production. Furthermore, Tilda management agreed

[57] These early estimates overestimate the extent of large-scale deals in Uganda and confuse current investments with older established farms. This shall be further discussed in Chapter 2. For a detailed review see Zeemeijer (2012).

[58] The idea was not to have a representative study of country-wide development, but to analyse the impacts of one specific case, which immediately raises questions regarding selection (bias) and limitations on generalisation. A case-study in that regard is no substitute for a cross-country analysis, but rather they are complementary. A case-study may produce hypotheses that can be tested by broader cross-country comparisons, and any cross-country analysis should be supported by case-study evidence.

[59] To allow easier attribution, I preferred green-field investments over privatization of older schemes, etc. However, strictly spoken, even in the Ethiopian case, the dam already existed prior to the project and thus past developments have an lasting impact till today. See also Section 2.4.4 for a discussion on the case studies and their context specificities.

to cooperate with my research efforts.[60] Thus, the selection of the second case was partly influenced by the selection of the first case (crop).

Analytical approach: In this research I subscribe to the realist ontology. The layered approach has revealed how the impacts across the five channels differ over time. Slow change makes attribution increasingly difficult, as over time more confounding factors appear. Therefore I employed a layered approach using one case to look specifically at rapidly changing allocation of the factors of production (*ceteris paribus*) and another case focused on change in the organisation of transactions and property rights, which are assumed to take a longer period to adjust (Frequency of change in Figure 1.8).

Figure 1.8 Layered approach of social analysis applied to conceptual framework

	Level of social analysis	**Frequency of change** (years)	**Purpose** of change	**Impact channel(s)** as in conceptual framework	**Focus within Ph.D. thesis**
L1	Embeddedness: informal institutions, customs, traditions, norms, religion	10^2 to 10^3	Often non-calculative: spontaneous		
L2	Institutional environment: formal rules of the game – esp. property (polity, judiciary, bureaucracy)	10 to 10^2	Get the institutional environment right: 1st order economizing	Institutions (PRs, public policies)	Types & trends, and Ugandan case *(ex-post)*
L3	Governance: play of the game – esp. contract (aligning governance structures with transactions)	1 to 10	Get the governance structures right: 2nd order economizing	Technology & organisation (tech. adoption and change in production)	Ugandan case *(ex-post)*
L4	Resource allocation and employment (prices and quantities; incentive alignment	Continuous	Get the marginal conditions right: 3rd order economizing	Land, Labour, & Natural Resources (use and prices)	Ethiopia *(ex-ante)* and Uganda *(ex-post)*

Theoretical approach
L1: social theory
L2: economics of property rights
L3: transactions costs economics
L4: neoclassical economics/ agency theory

Analytical approach
L1: deduction
L2: deduction-induction
L3: deduction- induction
L4: induction (deduction)

Source: author's compilation, elaborated on Williamson (2000, p597).

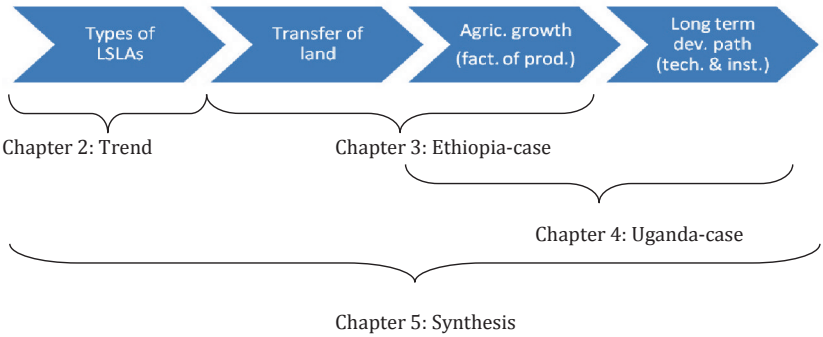
[60] Farm management agreements were considered a crucial precondition for deeper understanding of farm management and how it interacts with local communities.

In that way I combined a neoclassical, merely deductive approach for the ex-ante analysis with an institutional economics, inductive-deductive approach for the ex-post analysis of the well-established case. In the Ethiopian case study analysis the complexity of the scenario is reduced to a "complicated system" (through a number of assumptions), which allowed for ex-ante analysis and insight into causality. For the Uganda case study, I apply an institutional analysis, that accepts complexity of change across the layers and thus presents a plausible narrative to explain the 'emergent order,' which is observable today (ex-post).

1.4 Organisational Structure

In Chapter 2 I review the types and trends of investments in Uganda and Ethiopia, and make reference to overall development in East Africa. I briefly discuss the role of host country politics with regard to LSLAs and subsequent large-scale agricultural investments (LSAIs). Chapter 3 presents the Ethiopian case study. In the analysis of this early stage investment I predicted future impacts on livelihood strategies and income-poverty among local populations due to investment expansion. I applied a mathematical programming model to measure the LSAI's impacts of the reallocation of land, on values of labour, land and natural resources (shadow prices). In the Uganda case study presented in Chapter 4, I examined long- and medium-term impacts of the investment on technological and institutional change using an ex-post analysis. By applying a mixed-method based analytical narrative approach, I explored how the introduction of a new crop to the area has spread among local producers, changed property rights, the local land market, and affected the organisation of production. Finally, in Chapter 5 I present a synthesis of the empirical findings and reflect on them with regard to relevant theoretical and policy-related discussions.

Figure 1.9 Consequent steps of analysis to judge impact of land deals



2 TYPES AND TRENDS OF LARGE-SCALE LAND ACQUISITIONS: COUNTRY-LEVEL EVIDENCE FROM ETHIOPIA AND UGANDA

2.1 Introduction[61]

"A cluster of deals are identified in the eastern part of the African continent in countries like Ethiopia, Mozambique, Uganda and Madagascar, while other large recipient countries are Sudan, Mali and the Democratic Republic of Congo."

(Friis & Reenberg, 2010, p. 18, based on review of media-reported deals.)

While the phenomenon of LSLAs is growing across the globe, Sub-Saharan Africa (SSA) has become the region most affected.[62] East Africa has proven to be very attractive to investors. Ethiopia is among the countries that have leased out huge areas to foreign investors. It has been claimed that 14% of the agricultural land in Uganda has been leased out to large-scale investments or is under negotiation (Friis & Reenberg, 2010). Both countries are therefore excellent cases to investigate the impacts of LSLAs. Despite much media attention on a few large-scale international cases, reliable discussions on the extent and nature of the projects, their institutional arrangements, and regional distributional pattern are lacking. Validation of media reported projects remains a challenge, as the related difficulties of the Land Matrix project confirm.[63]

Two recent publications make a solid first attempt to review investment activities in Ethiopia. A recent review of the process of LSLAs by Dessalegn (2011), a leading land specialist in Ethiopia,

[61] Parts of this chapter have been published as a book chapter titled "*Change in trends and new types of large-scale investments in Ethiopia,*" in Allan, Keulertz, Sajano, & Warner (2012) the "Handbook on Land and Water Grabs in Africa," London: Routledge, pp.176-90 (see Baumgartner 2012).

[62] Outside Africa, Pakistan, Kazakhstan, Cambodia, Laos, Philippines, Indonesia, and parts of Eastern Europe (e.g. Ukraine) are among the major recipient countries of FDI in land (Anseeuw, Wily, et al., 2012).

[63] The Land Matrix is hosted by the International Land Coalition (ILC, in Rome) and jointly managed by German Institute of Global and Areas Studies (GIGA, Hamburg), Centre for Development and Environment (CDE, Univ. Bern) and Cirad (Montpellier). Since its inception in 2010, the Land Matrix has kept changing the way data is made available online in response to criticism about overestimations. The first response was in early 2012, which included a 'reliability code' for investments, depending on the quality of the source and frequency the case had been reported. Since early 2013 the Land Matrix only reports confirmed deals from reliable sources. Projects are distinguished by stages as either implemented, intended or failed cases. See www.landportal.info/landmatrix for further information and Anseeuw, Boche, et al. (2012) for methodological issues.

discusses the available case evidence based on information from local sources, newspaper articles, and field visits to two regions. This study examines the potential adverse socio-economic impacts of LSLAs and recent government policy. The other study, conducted by the Oakland Institute (2011), identified potential negative impacts of the recent wave of LSLAs such as adverse effects on food security, environmental issues, and displacement of local population.

For Uganda, fewer systematic reviews were available at the start of this research. I found two larger reviews that were recent and a number of case studies. The most reliable is an exploratory study by Zeemeijer (2012), which reviews media reports for Uganda on a case-by-case basis and included visits to six different sites across the country. Another large review of case study evidence on large-scale investments in Uganda was conducted by the FAO (Arias et al., 2012) and features a couple of older, well-established projects. While these studies offer interesting case study evidence, they are not capable of describing any patterns or historical trends in LSLAs.

In this chapter, I examine information about investments in the agricultural sector for patterns among the existing and planned investments with respect to country of origin, target location, and size characteristics. I seek to answer the question: *What type of investments can be observed in both countries?* Furthermore I review existing information on historical patterns of LSLAs to answer the question: *Is the current trend in large-scale investments structurally different from past investments?*

For Ethiopia, I triangulated three different data sets. Each included data on different aspects of past and on-going investments in agricultural land in Ethiopia. The first dataset (EIA 2011a) lists investment licenses for all of Ethiopia for the period from 1992 to January 2011. The second dataset was purposely collected for my research on LSLAs through senior government officials in the Prime Minister's offices, the Ministry of Agriculture and Rural Development, and from Regional Administrations (PMRA 2011). This dataset includes information on the status of projects across regions, and which zones and districts are especially active and attractive to investors. The last dataset from a regional investment office indicates how much land was requested and subsequently appropriated to each investor (Gam EIA 2011).[64]

For Uganda, two data sets on LSLAs in Uganda were analysed. The first is a list of active investments in the country obtained from the Uganda Investment Authority (UIA). I compiled the second dataset based on media reported projects in collaboration with Zeemeijer (2012).

In the following section I introduce the context of land transactions in Ethiopia and Uganda. I used a brief outline of the political and economic history of both countries and government

[64] See the brief discussion on these data sets in the Table 7.2 (Appendix).

policies related to agriculture investments to put the analysis of most recent investments into context. The following section presents the findings from both country cases. For Ethiopia I first discussed the trend of LSLAs and then looked for patterns among the types of investments and available data on demand for and supply of farmland. In the analysis of the Uganda case I focused on the (lack of) validity of media reported investments and contrasted them with available government data. Based on this, I distinguished between types of investors and discussed their historical backgrounds. In the last section I discuss the findings and orient them within the broader research objective of this study.

2.2 Large-scale agricultural production and the role of land in an agrarian society

2.2.1 Potential risks and benefits of large-scale production

Foreign investments in agriculture involving substantial amounts of land are not necessarily a new phenomenon.[65] The acquisition of user-rights to land is often accompanied by large-scale agricultural production in the form of plantation or mechanised agriculture, however, other forms such as contract farming schemes also occur. The *organisational form* of an investment has strong influence on asset accumulation and human capital formation, as well as growth and socio-economic development. Production scale is also important from a simple efficiency point of view with respect to what size is *optimal* for production (Lipton, 2009).[66]

The organisational form of plantations for cash crop production using hired labour facilitates internalising gains from investments in infrastructure and cultivating vast tracts of land. The efficiency of large-scale agricultural production outperformed family farms at initial stages of converting land to agricultural production in labour-scarce economies.[67] However, "*[…] technological scale economies arising from the use of indivisible inputs such as managerial ability or machines are outweighed by scale diseconomies from the use of hired labour as the economy moves from land-abundant to land-scarce stage after the completion of the opening process*" (Hayami, 2010, p. 3308). The need for close coordination between production and large-scale

[65] The colonial attempts (and sometimes successes) of establishing plantations in the colonies are a first wave, which in many cases survived colonial rule.

[66] This is just a short overview on this issue. Many aspects are crop-specific and depend on topography, and other factors. However, the organisational form will be one key institutional aspect determining medium- and long-term impacts of the on-going LSAI.

[67] Apart from plantation crops, the expansion and management of agricultural production has historically been characterised by owner-operated farms. Increases in farm size were mainly driven by rising non-agricultural wages (Deininger et al., 2010; Lipton, 2009).

processing and marketing of products is the second justification for large-scale production. Commercial banana production and non-fermented black tea for export are examples.[68] However, once local farmers are cultivating the same crops, small-scale production often proves to be more efficient on a per hectare basis, mainly due to lower supervision costs of family labour (Deininger, 2003; Hayami, 2010; Lipton, 2009).[69] A third reason for the persistence of plantation-based or large-scale production is that long-term concessions are often granted to (powerful) elites.

While the first two reasons explain the existence and persistence of large-scale production on the basis of economic efficiency, the last reason reflects the danger of political power corrupting efficiency arguments.[70] Similar phenomena were found by comparative studies from Latin America: Deininger (2005) used historical evidence to compare Colombia and Costa Rica with El Salvador and Guatemala. While these four countries share many common characteristics,[71] their governments reacted in very different ways to the coffee boom in the nineteenth century. In El Salvador and Guatemala agricultural production was organised in large holdings that relied on repressive labour markets to remain economically viable. The boom led to massive expropriation and accumulation of land by a few, while indigenous communities lost their traditional use rights. The fact that large landholders had enough power in the labour market and were able to pay only meagre subsistence wages deprived the workers of any incentive to invest in human capital formation (education, etc.). In contrast, elites in Costa Rica and Colombia relied on trade rather than large-scale production and coffee cultivation was dominated by small-scale producers. As a consequence the coffee boom spawned a productive smallholder coffee economy. The reactions of socio-economic development indicators, such as literacy rate, per capita GDP, etc. have differed strongly between the two pairs of countries. Interestingly the establishment of democracy occurred about 40 years later in the two countries characterised by large-scale coffee production (Deininger, 2005).[72] This example, and much of the literature on the growth-stimulating effects of greater equality of asset distribution (e.g. Cornia & Court 2001,

[68] Yet, even here in many cases such as sugar cane production it can be argued that losses from delayed processing are annulated by lower monitoring costs of family labour (Hayami, 2010).

[69] This general observation is also confirmed by the Uganda case study discussed in Chapter 4.

[70] In a personal discussion with Erik Thorbecke (Cornell University) this was considered the main explanation for the persistence of LSAIs over the past century and thus perceived as a risk of the currently emerging large-scale schemes. I shall return to this in the last Chapter.

[71] All four countries had similar colonial histories, language, cultures, religion, topography, climate, production factor endowments, and agricultural technology and practices.

[72] This affirms Brenner's argument, that the emergence of capitalism in 17th century Britain was favoured/possible because peasantry was strong enough to resist marginalization/exploitation, but not so strong that it could over-through the land lords' rule (as happened during the French Revolution) (Brenner, 1977, 1985).

Deininger & Squire 1998, Ravallion 2009, Thorbecke 2013), often arguing for land reform (e.g. Lipton 2009), highlight that structural settings created through historical LSLAs often failed to provide local benefits in terms of poverty relief.

Nevertheless there remain potential benefits from increased investments in agriculture production and accompanying agricultural commercialisation. In that regard, the seminal work by von Braun and Kennedy (1994) is very helpful for deconstructing the complex dynamics of commercialisation by small-scale farmers. Commercialisation cannot only happen on the output side (i.e. greater share of cash crops produced on available land), but also needs to occur on the input side (i.e. more inputs acquired through markets, such as improved seeds, fertilisers etc.). When discussing the potential benefits of commercialisation, one important question is: What determines participation in commercialisation? The common concern that small farmers lack the necessary capital to participate is not confirmed by past studies, however they rarely participate proportional to their population share (von Braun & Kennedy, 1994; von Braun, 1995).[73] The impacts of commercialisation on employment can include changes to the level and structure of employment among local small-scale farmers. Family labour can be replaced by hired labour and vice-versa. In most studies the expanded use of hired labour was observed.[74] In several cases, the more commercialised crops seemed to be "men's crops". Nevertheless, empirical findings suggest that "*[t]he employment effects for the poor that result from commercialization are very crop-specific and a function of the local labour market and the technologies introduced*" (von Braun, 1995, p. 201). That study pointed out that program design, organisational form of production, and the technology applied shape the outcomes in terms of poverty reduction. Commercialisation has huge potential for improving nutritional status (rather than adversely affecting it). Again, crop specific conditions apply and surrounding markets or their inability to function might explain limited outcomes.

2.2.2 Country histories, land tenure systems and land transactions

Since the conquest of what has become Ethiopia's modern territory by the Amharic emperor, land has been concentrated in the hands of absentee landlords, land tenure was insecure, and arbitrary evictions threatened land users.[75] Huge areas were underutilised and production did

[73] Additional efforts and correction of associated markets, especially for credit, have to be made to make these pro-poor and promote participation of the poorest farmers. Farmers might not adopt to an optimal level, as they are willing to pay an 'insurance premium' as to not maximise profit but retain more food-crop production (von Braun & Immink, 1994).

[74] The impact on the level of employment also depends on initial conditions (i.e. how common hiring labour is in the particular context where commercialisation is taking place).

[75] Soldiers in the emperor's army (*neftegna*—man with a rifle) were rewarded with user rights over the newly conquered areas. Together with these rights the *neftegna* were granted the control over groups

not improve after medieval times. This feudal land use system was only abandoned after the revolutionary coup in 1974 that ended imperial rule (Crummey, 2000).[76] The newly established military regime of the *derg*[77] expropriated the *neftegna* and the state took over full control over the land. Under the slogan "land to the tiller," for the first time in Ethiopian history, long-term user rights were granted to small holders.[78]

State ownership of land and control over user rights continues to be the land governance policy pursued by the new Ethiopian government that has ruled since 1991 as the Ethiopian People's Revolutionary Democratic Front (EPRDF). "*Land is a common property of the Nations, Nationalities and Peoples of Ethiopia [that] shall not be subject to sale or to other means of exchange*" (Art. 40, Ethiopian Constitution 1995,(FDRE, 1995)). This is *de jure* in accordance with the *derg* regime's land policy/land management strategy. Since the change of government in 1991, the EPRDF emphasized its priority of developing the agrarian sector as major development strategy.[79] Despite initial efforts to increase farm size and introduce large-scale production, Ethiopia's agricultural structure remained dominated by small-scale farming.[80] Both Dessalegn (2009) and Pausewang et al. (1990) noted the adaptive capacity of small-scale farmers in Ethiopia in contrast to the prevailing negative view of "the peasant is backward."[81]

The first Christian missionaries arrived in Uganda in 1877 at the Buganda Kingdom, one of the four main kingdoms at the time. Since 1884 Buganda was a British protectorate, which later became a constitutional monarchy and gained autonomy in 1900 through the signing of the

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of small-scale farmers, who cultivated their land under quasi-slavery, feudal conditions and paid an agricultural levy to the *neftegna*.

[76] The extreme inequality that characterised the land tenure system not only impeded productivity and negatively impacted production and investment, but also contributed to the overthrow of the imperial regime (Deininger, Ayalew, & Alemu, 2006).

[77] *Derg* (Amharic for committee) is used to describe the military regimes rule, officially entitled "Armed Forces Coordinating Committee."

[78] In 1975 a partly socialist land reform took place. It led to the creation of Peasant Associations (PAs) in each community. These PAs were responsible for the allocation of and control over user rights to land and controlled by the state and its party apparatus. The formation of PAs led to massive collectivisation of peasant agriculture. Thereby the state not only controlled the mechanism by which land was distributed and controlled, but also took over the leading role of village level institutions related to agrarian organisation and rural development (Stellmacher, 2007b).

[79] This was known as the Agricultural Development Led-Industrialisation (ALDI). Only with the latest five-year plan in 2010, titled Growth and Transformation Plan (GTP), has the development of secondary sectors been defined as the second target of the government's development strategy.

[80] Zenawi's view on reforming a peasant state was shaped by his Marxist-Leninist theoretical background (De Waal, 2012).

[81] Pausewang et al. explain that farming practices, that are often called 'backward' (e.g. using a thin ox drawn plough), are actually cost-effective and environmentally friendly cultivation practices given local economic and environmental constraints. Many modern practices hasten soil erosion or degradation if not paired with costly inputs, and/or would require functioning credit markets, insurance or similar to hedge up-front investment risks.

Uganda Agreement.[82] Captain Frederick Lugard of the Imperial British East African Company established a system of indirect rule, leaving native chiefs in relatively powerful positions.[83] This governance structure contributed to regional disparities and the unequal distribution of wealth and power that still threaten the stability of the country today (Watt, Flanary, & Theobald, 1999).

Uganda gained internal self-governance in 1958 and became fully independent in 1962. The *Kabaka* (king) of Buganda was the first president and Milton Obote became prime minister.[84] A military coup under the leadership of Idi Amin ended Obote's first rule in 1971. Amin's rule was even more repressive. In 1972 he forced between 60,000 and 80,000 citizens of Asian origin to leave the country in an attempt to 'Africanise' the private sector (Bräutigam, 2003). This caused a significant loss of skilled manpower, as Asians had been prevalent traders and business people in the country since colonial times. Following a number of border rivalries with Tanzania (1972-1973) and an invasion of parts of Kenya (1978), Amin was overthrown in 1979.[85] The economy had shrunk by 25% under the rule of Amin. In 1980 Obote was re-elected.[86] At the same time, a small group of fighters founded the National Resistance Army (NRA), and grew sufficiently powerful to install Yoweri Kaguta Museveni as president in 1985.[87] By that time, the governmental institutions were deeply eroded and economic activities had moved into informality (Schlichte, 2005). Beginning in the 1990s, Museveni proposed deep political reforms to establish a democratic, participatory state with sufficient tax base, political control over the military, and sound economic growth. The establishment of local councils (LCs) is one of the main successes of Museveni for dealing with the main dilemmas of post-civil-war Uganda

[82] At that time the colonial administration was confronted with an indigenous administrative structure of four independent kingdoms, plus various ethno-political groups within what became Uganda.

[83] The British favoured the southern Baganda ethnicity, recruiting them disproportionately into the civil service. In addition, Baganda elites were granted large landholdings, which still influences today's land rights structure. The ethnicities of the Northern Kingdoms of Lango and Achole entered less lucrative military positions.

[84] Economic conditions in Uganda at the time of independence, as well as legal and political institutions (parliament and electoral rules), were comparatively strong. Obote's early policies focused on agricultural growth, with an emphasis on cotton and cash crop development, yielding average growth rates above 5% until 1971. However, in 1966 Obote abolished the four kingdoms and sent the *Kabaka* into exile, which led to ethnic tensions. He also abolished the local council structures and undermined the authority of chiefs, leading to a centralised system without participatory options for large parts of the country (Watt, Flanary, Theobald, 1999).

[85] The Tanzanian army and the *Uganda National Liberation Front* (UNLF) led the military invasion.

[86] Overall, historians claim that the conflicts of the 1970s and 1980s caused the deaths of half a million Ugandans (e.g. Watt, Flanary, Theobald, 1999).

[87] Beforehand Tito Okello had served as president for a few months, following a military coup against Obote's rule.

(Schlichte 2005).[88] During that period, Uganda became known as the 'pearl of Africa' or a 'donor's darling,' where economic policy reforms and poverty reduction efforts seem very promising.[89] In the 1990s, the country underwent public re-organisation and many former state-led enterprises were privatised and anti-corruption organisations were established (Watt, Flanary, Theobald, 1999). Nevertheless, since the 2000s Museveni's regime has been increasingly criticised for its clientele traits and its one-man party structure. Also, on-going decentralisation is widely thought to have gone beyond the point of efficient participation by local communities, creating an overly fragmented entity that is difficult to govern.

2.2.3 The role of land and its governance

In a traditional agrarian society, land is the most important natural resource. Access to land (and water) is crucial for most people's livelihood strategies. Hence, political and economic power relations, as well as social change and transition are embedded and reflected in the control over land and land allocation mechanisms. Within a federal system, such as in Ethiopia, each region regulates land transfers individually, rather than managing LSLAs through federal level entities, which conveys a degree of self-determination. Land transfers in Ethiopia are limited to defined period of time (typically 25 years) and are therefore lease agreements rather than permanent title transfers.[90] In Uganda, a variety of land tenure agreements exist, but foreigners can also only acquire user rights through a lease.

[88] Schlichte (2005) discusses the following six dilemmas: The *modernisation dilemma* (combining new and traditional authority systems), the *fiscal dilemma* (extending the tax base without overtaxing a poor economy), *the inclusion dilemma* (maintaining traditional power, even through personalised, corrupt practices, while establishing modern, accountable governance), the *communication dilemma* (establishing state ideology and communication that satisfies donors as well as domestic parties), the *militarisation dilemma* (finding the 'right'-size for the military, not too small to deal with internal struggles, but also not large enough to threaten the civilian state), and the *democratisation dilemma* (allowing participation of the population whilst maintaining the one-party power system of governance) (2005, pp. 260–76).

[89] Between 1987 and 1996, GDP grew at an impressive 6.5% per annum. Despite high population growth, per capita GDP increased at 3.4% annually. The share of the population living below the poverty line declined from 56% in 1992–93 to 44%, in 1997–98, and more recently to 31% in 2005–06. In 2003 Ellis and Bahiigwa described Uganda as *"[…] a success story of donor and government working together to provide a macro environment conducive to economic growth and poverty reduction"* (2003, p. 998). Donor funding plays an important role in Ugandan budgeting.

[90] This is also true for most other LSLAs in Africa (see (Cotula et al., 2009). The transaction of user rights to land, either through permanent sale or temporally defined lease, as a contractual arrangement poses several challenges to a developing country. Access and use rights are often overlapping and may be held by individuals, communities or groups (Meinzen-Dick & Mwangi, 2009).

In Ethiopia, all land is property of the state.[91] Regional authorities are responsible for the administration of land (i.e. the allocation of user rights, registration, adjudication, and taxation). Regional procedures must coincide with the federal constitution of 1995 and federal land laws (the latest from 2005). The land use rights of landholders are dependent on a number of conditions: residence in a *kebelle* (locality or sub-district), personal engagement in agriculture, proper management of the land, and other restrictive conditions.[92]

In practice, three types of land tenure prevail throughout Ethiopia. The first is the administrative base system in which the government allocates use-rights to farmers as described above. The second is a market-based tenure system that emerged in the past decade. Regulatory changes allow land leases. In addition, rather informal market-like arrangements such as sharecropping exist. Finally, in lowland areas a third custom-based non-market structure land tenure arrangement exists. Families receive land based on ancestral rules and through inheritance. In addition to these individual plot tenure systems, there also exist communal land titles (e.g. for forest or pasture land).[93]

Following the 1995 constitution and the 1998 Land Act, land in Uganda has been managed under four basic land tenure regimes. Each of these regimes imply different land rights for the user and thus grant different levels of tenure security (Bomuhangi et al., 2011).

- Leasehold tenure: Tenants receive the exclusive right to the land for a specified amount of time, typically based on annual lease payments. The state also leases land to tenants (e.g. foreign investors), for periods of 5, 49, or 99 years. Leasehold is the only tenure type available for foreigners, but all tenure options are available to Ugandan nationals.
- Freehold tenure: This is the most stable land title and is not widespread in Uganda. It is mainly limited to a small category of individuals, such as traditional authorities (kings, chiefs, notables) or a few large-scale agricultural estates, as well as some special interest groups such as churches (Bikaako & Ssenkumbu (2003) in Bomuhangi et al., 2011). Freehold tenure entitles the holder to full rights to use, sell, transfer, subdivide, mortgage and bequeath the land.

[91] Private ownership of land is not allowed. Land users can only acquire use rights over land. It is not permissible to sell, mortgage or exchange land in any way. For a detailed discussion on the legal framework of agricultural land in Ethiopia see Dessalegn (2009).

[92] Holders who violate any of these conditions are subject to penalties or can even lose their land rights. They can also lose land rights if they are absent from their farms or the land is left idle for three or more consecutive years. The government has the right to withdraw the user rights to the land for "public purposes" or if it considers that the land will be more valuable if utilised by investors, cooperative societies, and other public or private entities. In such instances compensation shall be paid to the former holder. However, many holders whose land has been alienated have often complained that the compensation paid has been inadequate (Dessalegn, 2011).

[93] The different tenure systems play a role in the process and outcome of LSLAs, especially for identifying land and deciding whether land is "un-used" or not, as well as for compensation of previous occupants.

- Customary tenure: Most land in Uganda is held under this regime, whereby access to land is "*governed by the customs, rules and regulations of the community*" (Bomuhangi et al., 2011, p. 11). Holders do not have formal titles, but their tenure is recognised under Article 237(1) of the 1995 constitution (GoU, 1995).
- Mailo tenure: As briefly mentioned above, the British rulers rewarded chiefs and kings with large estates if they advanced British interests.[94] Mailo land is recognised by the state (Constitution UG -Article 237(1)). Often the land is used under *kibanja* tenancy, a peasant tenancy system where the tenants do not hold full ownership rights, but face some restrictions regarding changes on the land and they have to pay a small rent to the mailo owner. The 2010 Land Act Amendment (GoU 2010) has strengthened tenant rights, making eviction more difficult and limited the maximum rent payment. Duration of the tenancy is unlimited.

In addition to these four types of tenure, there also exists a public tenure regime over land designated for public use. This includes public infrastructure such as roads, buildings, etc. as well as some forests, mountains and wetlands. Wetlands are even classified as public land when they are located within a property held under customary or mailo tenure (Bomuhangi et al., 2011, p. 6). This poses potential conflict due to overlapping user rights.

2.2.4 Agricultural potential and availability for expansion

There is little agreement on the amount of arable land in Ethiopia.[95] The official estimates on the share of the total territory that is suitable for annual or perennial crop cultivation, range from two-thirds (MoARD, 2009a) to one-half (MoWR, 2002) (see Table 2.1). The estimates of the share of this potentially arable land area that is actually used for agricultural production range from 25–33% (between 16.6 and 18 million hectares). In contradiction to these government sources, a recent study by the World Bank estimated that about 80% of the potential total is already used (Deininger et al., 2010). One explanation for the huge discrepancy between these numbers is the definition of 'used' land. The government's land cover inventory, which is often based on satellite imagery, only lists land that is (or was during the satellite observation) under cultivation. It does not include communal land used for fruit, timber and fuel wood collection,

[94] As this land was granted in square miles (640 acres ~ 260 ha) the name *mailo* was adopted (See West, 1965).

[95] There is more agreement regarding the irrigation potential of Ethiopia. Ethiopia has 12 river basins with an annual runoff volume of 122 billion m^3 of water and an estimated 2.6–6.5 billion m^3 of ground water potential, which averages a relatively large volume of 1,575 m^3 of available water per person per year. However, due to the lack of water storage infrastructure and large spatial and temporal variation in rainfall, there is not enough water for most farmers to produce more than one crop per year (Awulachew et al., 2007). The International Water Management Institute (IWMI) in Ethiopia claims a total irrigation potential of 3.7 million hectares, out of which only about 5–6% are already developed (Awulachew et al., 2007). The irrigated area in 2002 was 197,000 ha with a composition of 38%traditional, 20% modern communal, 4% modern private, and 38% public (MoWR, 2002). The revised figure puts the total irrigated area at about 250,000 ha (Awulachew et al., 2005). This number gives a per capita irrigated area of about 30 m^2 compared to the global mean of 450 m^2.

pathways and fallow land (Dessalegn, 2011). Further, neither of the two government studies states how much investment would be required to make the 'potential' arable land viable for production.[96]

Table 2.1 Variability of official agricultural potential land area figures, Ethiopia (million ha)

	MoARD 2009		MoWR 2002	
Total land area	111.5	100%	111.5	100%
Potentially arable	74.3	67%	55	49%
In cultivation	18	16%	16.6	15%
Under-used/un-used *	56.3	50%	38.4	34%

Source: Gov. of Ethiopia: (MoARD, 2009a; MoWR, 2002)
Note: * The figures presented in both reports are contested. See discussion above.

Uganda's total territorial area measures 24.2 million hectares.[97] Cultivated land cover increased from 8.4 million hectares in 1990 to 9.9 million hectares in 2005 (UBOS, 2010). Interestingly, while the area of cultivated land has increased according to the Uganda Bureau of Statistics (2010, p.1), the area of commercial farms was stable from 1990 to2005 at 68,450 ha. This might be indicative of a lack of accurate information on commercial farmland, rather than a true reflection of current conditions.[98]

2.2.5 Government investment policies and regulations for large-scale investments

In Ethiopia, the government's rural development strategy was based on small-scale producers during the first decade of the regime and the land tenure system put in place was considered to be peasant friendly. Starting in the 2000s a shift towards large scale commercial farming and foreign investors began, based on the logic that once "*[…] the objective of accelerated agricultural development is achieved … [t]he key actor[s] in the sector's development will be relatively large-scale private investors and not the semi subsistence small farmers*" (Dessalegn, 2011, p. 9). This change in government focus became apparent as a number of investment-stimulating legislative changes and proclamations were issued to attract foreign investors to the agricultural sector.[99]

The main legal basis for investments in Ethiopia is Proclamation 280/2002 (and amendments 375/2003). These specify incentives for attracting foreign investments in order to promote

[96] Studies on land degradation and especially recent work on the Economics of Land Degradation (Nkonya et al., 2011) show that production on marginal land is possible, but once lands are degraded beyond a certain threshold re-vitalization becomes very costly.

[97] This includes 4.17 million hectares of surface water and wetlands, and 19.98 million hectares of land.

[98] There is no clear definition of what is considered 'commercial farmland' in distinction to 'normal' farmland in the Statistical Abstract (UBOS, 2010).

[99] Previously, foreign investments were mainly incentivised to support manufacturing and industrial production (see Dessalegn, 2011).

export industries and technology transfer, and thereby increase foreign exchange.[100] In 2009 another proclamation (29/2001) changed the process of land allocation. The federal government was empowered to carry out all aspects of foreign land transfers involving 5,000 ha or more. The Agricultural Investment Support Directorate (AISD) was founded within the Ministry of Agriculture and Rural Development (MoARD) to assist investors in land acquisitions, facilitate the land transfer process, and review business plans. Fourteen documents are required from investors, including: an Environmental Impact Assessment, a business plan, bank statements, credit history, and others. The MoARD furthermore established a Land Bank to list potential land for agricultural investment. Regions were advised to identify suitable areas and earmark them for agricultural investment activities.

Entities planning to invest in Ethiopia first have to obtain a business license at the Ethiopian Investment Agency (EIA), either in Addis Ababa or through one of its regional branches, making the EIA the entry point for all foreign investors.[101] Before the new proclamation and establishment of AISD, investors had to contact regional investment offices or governments to identify suitable investment properties.

In Uganda, investments in large-scale agriculture are not exclusively regulated. This is one important difference from Ethiopia. Some general regulations apply to foreign investors (especially regarding ownership – see below), but the land market is open and buyers simply have to find a seller and agree on a price. The Uganda Investment Authority (UIA) forms the point of entry for foreign investors. Its mission is to facilitate and offer investment opportunities to domestic and foreign investors. Investors must procure an investment license from the UIA that is valid for not less than five years. In addition, the UIA attempts to connect investors with landowners to facilitate partnerships. In that regard it tries to pair demand for land with existing supply.[102]

[100] For fully foreign investors a minimum capital of US$ 100,000 is required, which decreases if investors work jointly with an Ethiopian partner, or export more than 75% of their output. The investment regulation 84/2003 lists numerous incentives for investors and outlines, which sectors are limited to domestic investors only, and which are also open to foreign investors. In this way this legislation limits the wholesale trade of locally produced products, the production of input materials for export products, and numerous value-added industries to domestic investors. The remaining activities are allowable for foreign or domestic investors. This legislation has recently changed, removing most of these limitations, however, for the data presented in this research it was still relevant.

[101] Domestic investors are also required to have investment licenses.

[102] According to interviews with an UIA senior officer, some landholders have approached the UIA to look for investment partners. In other cases, the UIA—partly in coordination with the Ministry of Lands (MoL), directs investors to potential partners or regions of interest. However, the greater part of investments facilitated by the UIA is not in the agricultural sector.

According to the Uganda Investment Code and the 1998 Land Act, foreign investors are not permitted to own land, but can acquire lease rights for periods of up to 99 years. If a foreigner wants to purchase more than ca. 20.2 ha (50 acres) the request needs to pass through the Cabinet. Foreigners may acquire land in joint ventures, as long as the majority of shares is held by an Ugandan national or business. A minimum investment threshold of US$ 100,000 protects domestic SME from foreign competition. For capital intensive investments that are expected to be especially beneficial for Uganda's economy, the UIA supports land acquisition (leased). According to the UIA, two of the following three requirements must be met: (i) capital intensity: more than US$ 400K per ha (US$ 1 million per acre); (ii) high value addition and export orientation: the share of exports of value-added products must exceed 80% of total production value; (iii) labour-intensity and demand for skilled workers: the employment of semi-skilled manpower must be at least 30 workers/acre. I could not obtain information on how often this preferential treatment occurs to foreign investors, but it illustrates the government's economic policy and attempt to channel FDI towards capital-intensive, labour-intensive (skilled), and export-oriented high-value goods. Large-scale agriculture production does not usually fall into this range, as labour intensity is typically much lower and requires (at least partially) un-skilled workers.

The current national development strategy was published in April 2010. It states that despite the high growth rates of the overall economy, the agricultural growth rate declined, leaving large parts of the rural population out of the national growth dynamic. Primary commodities still predominate over industrial products, indicating that value-adding activities remain rare. The new sectors are not able to absorb the rapidly growing labour force. In a market-friendly view, the government states that capital markets are still weak and do not sufficiently intermediate capital. Accumulation of core production infrastructure (especially transportation and energy) is still limited. These 'bottlenecks' hinder the desired socio-economic transformation of the nation from a primarily agrarian structure to a more industrialised and eventually service sector driven economy (GoU, 2010).[103] For the 2010–2015 period the first priority of national agricultural policy is *"[…] pursuing a private sector led and market-oriented economy. In doing this the government will work on constraints that hinder the private sector to invest more in agriculture*" (MAAIF, 2010, p. 28).

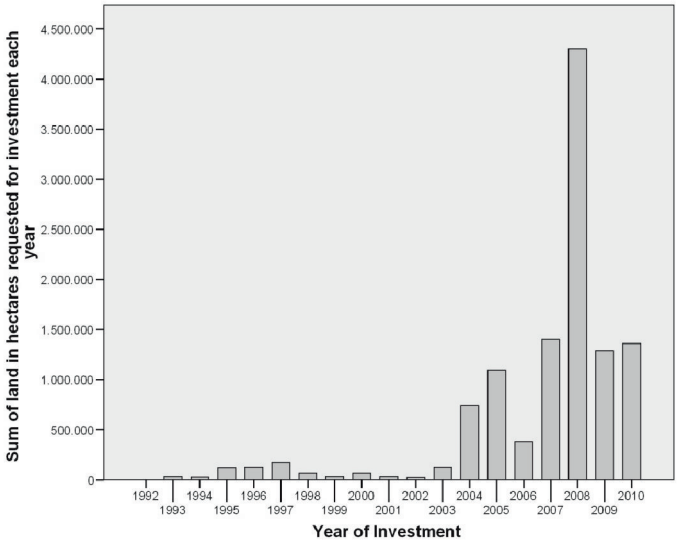
[103] The National Development Plan makes reference to successful developmental states in East Asia and also that "[…] *addressing these challenges calls specifically for stronger state leadership in guiding and setting the pace for economic transformation"* (GoU, 2010, p. 2). This can be seen as an interesting parallel to the state-led development plan in Ethiopia, and partly contradicts the market-led policy pursuit in Uganda during much of the 1990s and early 2000s.

2.3 Trends and types of large-scale agricultural investments in Ethiopia and Uganda

2.3.1 The trends of agricultural land-based investments in Ethiopia since 1991

The histogram (Figure 2.1) shows the total annual demand for land for the period 1992–2010. More land was requested from 2004 onwards. This coincides with a change in the government investment policy in the early 2000s (see section 2.2). The decline for 2006 might be partially due to the national elections and reduced investment activities in that and the following year. Since 2007, however, interest in farmland increased. This confirms the global trend following the global food price spike in 2007. In 2005, for the first time, a total of more than one million hectares was requested, and 2008 shows a peak at more than 4.3 million hectares requested by domestic and international investors.

Figure 2.1 Total land requested by investors per year in Ethiopia: 1992–2010



A similar trend can be observed from the quantity of licenses issued to investors.[104] For the total time period 10,075 licenses were issued, but in the four years from January 2007 to January 2011, 7,085 licenses were issued. This indicates an even stronger increase in the non-land-

[104] Not all license requests involved significant amounts of land as some were for uses that require much less land (processing and packaging). While the trend in request data is an indicator of agricultural investment activities in general, they will only be discussed shortly given the focus on investment in land.

based investments, such as business activities in food processing and marketing, however, these licenses are for agriculture investments. Trends in these investment licenses are an indicator of 'investment activity'. It is possible to observe regional patterns of change and the distribution of agricultural business activities across the country. Table 2.2 lists the number of agricultural investment licenses issued per region. The first column lists the overall distribution for 1992–2010. The majority of the investments target Amhara and Oromia, followed by SNNPR and Tigray. These are also the most populous regions of Ethiopia, and possess the most developed infrastructure (market integration). The second column lists the subset of agricultural investment licenses for the last four years only.[105] The areas of greatest interest (as share of total licenses issued) are the same four regions. There were minor changes among the shares of the other regions.[106]

Table 2.2 Frequency of agricultural investment licenses issued in Ethiopia by regions over two periods:1992–2010 and 2007–2010

	Total period (1992–2010)		New period (2007–2010)		Comparison of the two periods		
Region	# of Licenses	% Share	# of License	% Share	Rate of change (new/total share)		Percentage after 2007
Addis Ababa	291	2.9%	78	1.1%	0.38	-62%	26.8%
Afar	137	1.4%	72	1.0%	0.75	-25%	52.6%
Amhara	2,421	24.0%	1,877	26.8%	1.11	11%	77.5%
B.Gumuz	526	5.2%	468	6.7%	1.28	28%	89.0%
Dire Dawa	188	1.9%	85	1.2%	0.65	-35%	45.2%
Gambela	188	1.9%	173	2.5%	1.32	32%	92.0%
Harari	34	0.3%	2	0.0%	0.08	-92%	5.9%
Oromia	3,915	38.9%	2,699	38.5%	0.99	-1%	68.9%
SNNPR	1,145	11.4%	779	11.1%	0.98	-2%	68.0%
Somali	42	0.4%	27	0.4%	0.92	-8%	64.3%
Tigray	866	8.6%	503	7.2%	0.83	-17%	58.1%
Multiregional	322	3.2%	252	3.6%	1.12	12%	78.3%
Total	10,075	100.0%	7,015	100.0%			69.6%

Data set: EIA 2011a = All business activities, including those involving less than 100 ha land; Ethiopian Investment Agency.

The last set of columns in Table 2.2 shows the change in distribution when comparing regional shares of all licenses to its share after the boom (i.e. after 2007). In this calculation a value of one would indicate no change, while a value >1 or <1 indicate a relative increase or decrease of regional investment activities, respectively. The next column indicates the percentage change. In the three city states, investment activities decreased significantly: Harari (0.08), Addis Ababa

[105] The year 2007 is a cut-off point because it coincided with the "rising global interest in acquiring farmland abroad" (von Braun & Meinzen-Dick 2009; Deininger et al. 2010).

[106] I calculated a "rate of change" for the regional share of the total of all investments. This provides an indicator of how the smaller and less populous parts of the country became targets of increasing investment activities, not all of which are related to land acquisitions.

(0.38), and Dire Dawa (0.65).[107] The last column shows that for most regions the greatest share of investments took place after 2007.

Using the amount of land (in hectares) requested for investment, I explored how the allocation of land across regions developed (Table 2.3). Over the total period (1992 until Jan 2011), Oromia hosted almost one-third of the land allocated, followed by Amhara (15.4%). Together with the multi-regional licenses these two regions account for over 75% of the land requested. SNNPR, B. Gumuz and Gambela are the three other regions that experienced significant demand for land.[108] Only very limited amounts of land have been requested in Addis Ababa, Dire Dawa, Harari and Somali (all below 10,000 ha). Tigray and Afar had about 300,000 ha of land requested. Thus, most activities are concentrated in the two larger highland regions Oromia and Amhara, followed by some significant shares in the South (SNNPR) and West (B. Gumuz and Gambela).

Table 2.3 Regional distribution of commercial farmland requests by area: Ethiopia 1992–2011

Region	Total period (1992–Jan 2011) Land (in ha) *(% share total)*		Post-food Crisis (2007–Jan 2011) Land (in ha) *(% share new)*		Comparing two periods Rate of change (new/total share)		Share after 2007
Addis Ababa	81,523	*(0.7%)*	25,200	*(0.3%)*	0.42	↘	30.9%
Afar	325,146	*(2.8%)*	112,991	*(1.4%)*	0.47	↘	34.8%
Amhara	1,754,555	*(15.4%)*	1,247,124	*(14.9%)*	0.97	→	71.1%
B. Gumuz	590,446	*(5.2%)*	428,150	*(5.1%)*	0.99	→	72.5%
Dire Dawa	79,300	*(0.7%)*	35,500	*(0.4%)*	0.61	↘	44.8%
Gambela	529,180	*(4.6%)*	506,880	*(6.1%)*	1.31	↗	95.8%
Harari	7,400	*(0.1%)*	*	*	*	n. a.	0.00%
Multiregional	3,400,625	*(29.8%)*	3,126,362	*(37.4%)*	1.26	↗	91.9%
Oromia	3,426,540	*(30.0%)*	1,857,902	*(22.2%)*	0.74	↘	54.2%
SNNPR	1,003,750	*(8.8%)*	945,439	*(11.3%)*	1.29	↗	94.2%
Somali	9,379	*(0.1%)*	3,379	*(0.0%)*	0.49	↘	36.0%
Tigray	203,512	*(1.8%)*	68,600	*(0.8%)*	0.46	↘	33.7%
Total	11,411,358	100.0%	8,357,527	100.0%	1.00	-	73.2%

Data set: EIA 2011b = Subset of EIA 2011a; only investments involving at least 100 ha.
Note: * No investments of this size recorded for Harari region after 2007. Requested land might not be fully developed or even allocated; figures reflect investor's demand for land.

The second column lists the subset of investments for the years after 2007 only. Oromia and Amhara remained major target regions and the SNNPR, B. Gumuz and Gambela continued to attract a lesser amount of investment requests. The more urbanized regions received a

[107] These three entities are city-states and decreasing agricultural investments might easily be explained by high rates of urbanization and transition from primary to secondary sector activities.

[108] Most multiregional licenses also state one or more of these three smaller regions as part of their location.

decreasing amount of attention. The last column allows comparison between the two periods.[109] The largest increases were observed in Gambela (1.31) and SNNPR (1.29), as well as for multiregional licenses (1.26). Overall, about 73% of the land was requested after 2007.[110]

Table 2.4 presents the number of projects grouped according to size: medium-size (100–1,000 ha), large-size (1,001–10,000 ha) and 'mega' size (>10,000 ha). In the right half of the table descriptive characteristics of the size of each project are displayed for the whole period. For all three investment groups the frequency and the size increased over the past two decades.

Table 2.4 Trends in investment project size in Ethiopia for the period 1992–2010

Year	Investments grouped by size (medium, large, mega)				Land in hectares (requested for investment)				
	Medium (100–1,000 ha)	**Large** (1,001–10,000 ha)	**Mega** (>10,000 ha)	**Total** # of projects (per year)	**Mean**	**Median**	**Min.**	**Max.**	**Standard Deviation**
1992		1		1		**2,000**			
1993	14	9		23	1,444	**400**	120	9,000	2,048
1994	39	5		44	633	**500**	112	3,100	596
1995	125	**16**	1	142	842	**400**	110	20,000	1,915
1996	130	**12**	2	144	872	**300**	120	25,000	2,498
1997	23	3	1	27	6,401	**350**	110	**153,713**	29,465
1998	19	9	2	30	2,325	**830**	120	25,000	5,088
1999	15	1	1	17	2,050	**250**	117	20,000	5,189
2000	28	6	1	35	2,017	**342**	102	42,000	7,038
2001	16	4	1	21	1,470	**500**	129	15,000	3,197
2002	9	2	1	12	1,859	**250**	110	15,000	4,219
2003	18	**15**	3	36	3,491	**1,250**	120	30,000	5,897
2004	42	**25**	**4**	71	**10,490**	**1,000**	110	350,000	45,545
2005	118	**37**	**4**	159	6,877	**500**	120	400,000	39,899
2006	139	**55**	**4**	198	1,922	**600**	112	40,000	4,025
2007	222	**54**	**10**	286	4,903	**500**	108	300,000	27,009
2008	744	**200**	**39**	983	4,376	**500**	110	**500,000**	27,943
2009	203	**99**	**19**	321	4,015	**1,000**	120	108,000	12,302
2010	159	**82**	**21**	262	5,191	**1,000**	103	150,000	16,302
Total	**2,063**	**635**	**114**	**2,812**	**4,056**	**500**	**102**	**500,000**	**23,337**

Data set: EIA 2011b

Overall, medium-sized projects between 100 and 1,000 ha (with most in this category below 500 ha) were most common. The second column shows that large-scale projects (1,000–10,000 ha) were requested throughout the two decades, with the first increase around 1996–97 and then a

[109] The 'rate of change' was calculated by dividing the share of recently requested land by the share of total land requested for the whole period. A value of 1 would indicate that there was no change, while a value <1 or >1 implies a relative decrease or relative increase in regional share of total land requested, respectively.

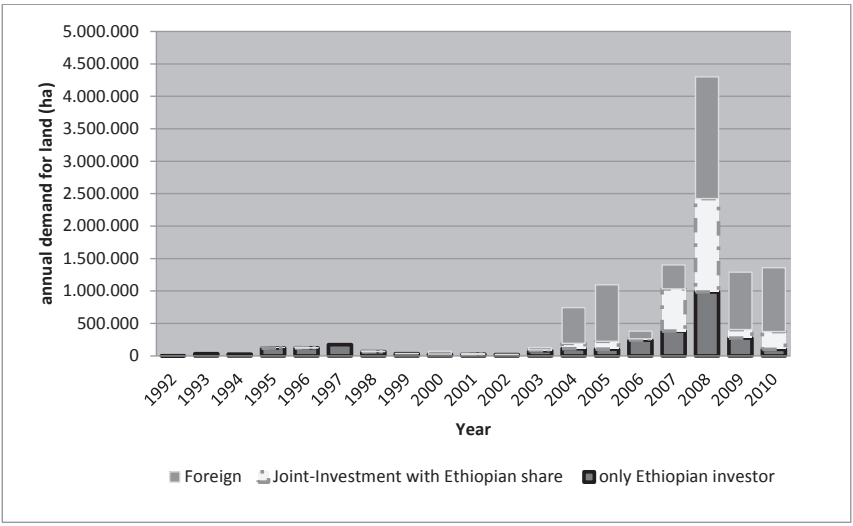
[110] Surprisingly there was little interest in Afar and Somali, which originally were considered feasible for castor seed production and jatropha (i.e. two much promoted biofuel crops). Security problems might explain especially why Somali, and to a lesser extend Afar were not targeted by investment requests.

continuously increase after 2003.[111] This trend was even more pronounced for mega-scale projects, with a first case in 1996 and a higher frequency after 2007.[112]

An increased mean land area requested each year reflects this growth in project size. However, the mean was heavily affected by a few huge projects as the increased standard deviation indicates. Even the median size of projects showed a slight increase, but remained rather low, confirming that most projects were medium-sized. The very largest projects (i.e. 34 licenses requesting more than 50,000 ha), accounted for ca. 53% of the total land requested—more than 5.8 million hectares.

Another often discussed trend is the *internationalisation* of land transactions (i.e. the increasing share of foreign capital relative to domestic capital).[113] As mentioned in the introduction, though not much reported in the media, domestic investors are major actors in commercial agriculture. I grouped the investment licenses according to their degree of Ethiopian versus foreign involvement: (i) fully Ethiopian, (ii) Joint Ethiopian-foreign, and (iii) fully foreign. Figure 2.2 shows the historic trend for the total sum of hectares requested by each group per year.

Figure 2.2 Total annual land requested in hectares by domestic, joint and foreign investors in Ethiopia: 1992–2010



Data set: EIA 2011b

[111] This is explained by the increased share of international investors as discussed below.

[112] A sub-set of these mega projects, involving more than 50,000 ha, included 14 projects in 2008, 3 in 2004, and 4 in 2005with a total of 34 for the period.

[113] Zoomers (2010, 2011) discusses the "*foreignisation*" of space.

Before 2003 domestic investors accounted for almost all land solicited and they increasingly requested land from 2005 onwards, with a peak volume close to one million hectares in 2008. Thereafter demand fell again to ca. 100,000 ha in 2010. Joint investments gained significance in 2005 with a total of over 120,000 ha. Demand was very high in 2008 with about 1.4 million hectares, but then dropped to about 200,000 ha for two consecutive years. The fully foreign investor group never requested more than 50,000 ha per annum from 1992 to 2003, but in 2004 a sharp increase to more than 500,000 ha occurred. This sharp increase was correlated with the changes made to investment policy in 2002 and 2003 (see section 2.2). Even after a short drop in investments during the year after the national elections in 2005, requests rose again to two million hectares in 2008 and around one million hectares of land for 2009 and 2010. This confirms increasing *internationalisation* of agricultural investments in Ethiopia on the demand side.

2.3.2 Types of investments in Ethiopia[114]

I grouped investments based on the primary country of origin. Domestic investors made up 2,246 of the total of 2,813 projects (ca. 80%), however, these requests were smaller in size than those of the other investor groups. Domestic investment shares decreased considerably as project size increases (*inverse relationship*). Investors from the Middle East represented the largest share of foreign investors, followed by Western Europe and North America. There was also significant interest from North Africa and South Asia, especially India. There were few investments from SSA countries, mostly from South Africa, and a small number from Southeast Asia and Latin America (Table 2.5, next page). As the share of total area requested, domestic demand accounted for ca. 26% or three million hectares, Middle East and Western Europe demand represented22% of the total area or 2.5 million hectares each. Investors from South Asia and North America requested 13% and 8% or about 1.5 million hectares and one million hectares, respectively.

[114] As shown in the above section, the pattern and frequency of agricultural investments involving larger tracks of land (above 100 ha) changed over the past two decades. I combined the trend-analysis with cross-sectional analysis of the available data to explore quality and types of investments.

Table 2.5 Frequency and size characteristics of agricultural investment requests in Ethiopia by origin

	Frequency of investments by size (medium, large, mega)				Demand for land in hectares (requested)			
Origin by Region *	Medium (100–1,000 ha)	Large (1.001 –10,000 ha)	Mega (>10.000 ha)	Total count	Median	Min.	Max.	Sum
Ethiopia (domestic)	1,790	437	19	**2,246**	500	102	153,713	**2,918,909**
North Africa	28	18	10	56	1,500	150	150,000	659,608
Middle East	84	75	29	**188**	2,000	120	**400,000**	**2,455,239**
Sub-Saharan Africa	4	1	2	7	800	400	22,100	52,300
Eastern Europe & Central Asia	2	1		3	350	200	3,000	3,550
Western Europe	62	35	20	**117**	1,000	110	**500,000**	**2,558,495**
South Asia	22	25	18	65	**4,000**	110	**500,000**	**1,510,051**
China	4	2	2	8	1,500	500	100,000	160,700
Southeast Asia & Pacific	5		2	7	500	200	100,020	133,820
Latin America & Caribbean	4			4	400	300	1,000	2,100
North America	58	42	12	**112**	1,000	120	**300,000**	956,586
Total	**2,063**	**636**	**114**	**2,813**	**500**	**102**	**500,000**	**11,411,358**

**Comment*: For joint-investments the group was based on the majority financier. As there were several joint-investments, the Ethiopian role should not be underestimated.

The maximum project sizes from these four regions were the largest ranging from 300,000 ha to 500,000 ha. While there was considerable variation in project size for all regions, the median values indicate that some regions tended to plan larger projects than others. South Asian investors sticks out with a value of 4,000 ha,[115] which was eight times more than Ethiopian investors, and twice the median size of Middle Eastern requests. Other regions had smaller shares, for example China had eight investment licenses with a rather small share of the total land deals. Latin America and the Caribbean, Eastern European, and Central Asian investors only had minor roles.

Looking at nationalities mentioned in the licenses, I distinguished four types: Ethiopian investors, joint-investments between Ethiopian and international investments, foreign investments with a single nationality listed and multi-national investments involving two or more nationalities involved (Table 2.6).[116] Again, Ethiopian accounts for the largest number of projects with the smallest size. On the other end, the multi-national investments are very few and tend to be very large.

[115] This was much lower than in most media reports.

[116] Given the huge standard deviation, reporting mean project sizes was not meaningful.

Table 2.6 Comparison of domestic, foreign and joint-investments in Ethiopia by size

	Investment size (medium, large, mega)				Land in hectares (requested)			
Ethiopian Share	Medium (100–1,000 ha)	Large (1.001–10,000 ha)	Mega (>10K ha)	Total	Median	Min.	Max.	Sum
Ethiopian investor	1,790	437	19	2,246	500	102	153,713	2,918,909
Joint investor (Foreign/Eth.)	77	47	26	150	1,000	110	500,000	2,743,192
Foreign investor	187	142	60	389	1,500	110	500,000	4,459,427
Mult. Foreign investor	9	10	9	28	4,500	250	350,000	1,289,830
Total	**2,063**	**636**	**114**	**2,813**	**500**	**102**	**500,000**	**11,411,358**

Data set: EIA 2011b

Next I want to explore where which investors requested land within Ethiopia. The left half of Table 2.7 lists the sum of land requested for the whole period by the four main investing regions or the five main target regions. The right half displays the sum of land requested by all foreign investments (with at least one foreign partner) and the percentage of foreign investments out of the overall total for each destination region (including domestic ones). Thus, I look at absolute hectares requested (left side) and relative share of overall totals (right side), to better understand the spatial pattern of investor's requests.

Table 2.7 Land demand (in ha) among major foreign investors in Ethiopia grouped by development status and region of origin

	Absolute demand (ha) from four main origins for those regions with demand >= 500,000 ha				Total foreign (including all origins)	
	Emerging Economies		Developed economies		Sum of *all* foreign	Share of overall total
Main destinations	**Middle East**	**South Asia**	**West Europe**	**North America**	*(excluding domestic)*	*(including domestic)*
Amhara	54,103	58,716	235,331	62,300	462,350	26.4%
B. Gumuz	274,500	52,000	12,700	23,450	404,650	68.5%
Gambela	103,000	133,000	53,280	8,000	302,580	57.2%
Multiregional	840,024	606,000	1,093,270	575,853	3,400,025	100.0%
Oromia	1,034,195	625,635	982,632	218,613	3,253,675	95.0%
SNNPR	96,267	20,700	139,262	49,970	470,499	46.9%
Total	**2,455,239**	**1,510,051**	**2,558,495**	**956,586**	**8,492,449**	**74.4%**

Data set: EIA 2011b
Note: only destinations with total demand above 500,000 ha and foreign investment groups requesting close to or above one million hectares are displayed.

As can be easily observed on the right, licenses for investments in Oromia and multiregional projects accounted for the greatest shares of foreign investments. Amhara had the lowest percentage of foreign investment at 26.4% of the land requested. Similarly in Gambela and the SNNPR, domestic investments accounted for a large share of the total land area requested. In Oromia the reverse seems true—about 95% of the land requested was by foreign investors.[117]

In order to answer the question: 'who gives out licenses where?' I used information on investment locations (by region) and the office issuing the licenses (by region) (Table 2.8). The diagonal line indicates that most licenses were issued by the respective regional office, implying a functional federal system. However, the second values in the EIA column indicate that the federal investment agency is increasingly involved in issuing licenses throughout the country. This role appears even more prominent based on the sum of land requested by licenses issued by the federal agency in Addis Ababa was over 8.4 million hectares out of the total of 11.4 million hectares. This is not surprising given the findings that foreign investments tend to be larger and that most of these investments are planned in Addis Ababa (rather than more remote parts of the country). The majority of foreign investors (530 out of 567) requested their licenses through the EIA. Amhara was the only other region that had a relatively large portion of foreign investors request their licenses (30).

[117] This analysis was limited to the regional level. Especially for the two large regions, Amhara and Oromia, it would be interesting to look at intra-regional changes. Given the scope of this chapter, such an analysis was not been feasible here. But indicators exist: within Oromia, for example, much of the potential area for extension is within the lower elevations in the southeast (Bale, ca. one million hectares).

Table 2.8 Investment licenses and land involved in Ethiopia by region

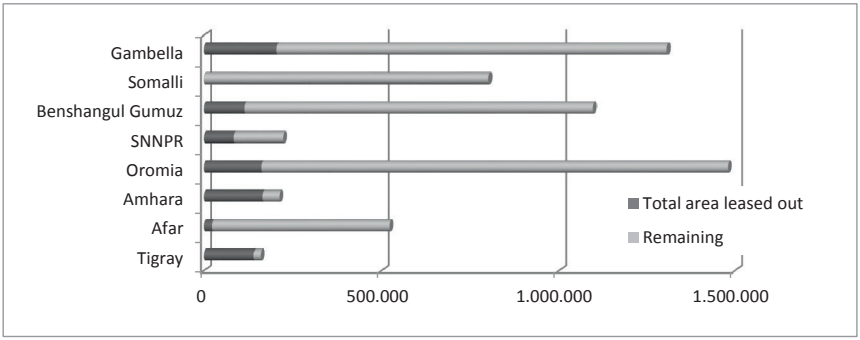
		Office issuing Investment License												
Region where Investment is located		**Addis Ababa**	**Afar**	**Amhara**	**B. Gumuz**	**Dire Dawa**	**EIA (federal)**	**Gambela**	**Harari**	**Oromia**	**SNNPR**	**Somali**	**Tigray**	**Total**
Addis Ababa	Count	9		1			18			1				29
	Sum (ha)	25,000	.	6,000	.	.	50,323	.	.	200	.	.	.	81,523
Afar	Count		61				11							72
	Sum (ha)	.	251,397	.	.	.	73,750	.	.	.	.	.	.	325,147
Amhara	Count			1,247			43							1,290
	Sum (ha)	.	.	1,355,530	.	.	399,026	.	.	.	.	.	.	1,754,555
B.Gumuz	Count		1		51		48							100
	Sum (ha)	.	2,000	.	168,796	.	419,650	.	.	.	.	.	.	590,446
Dire Dawa	Count					16	1							17
	Sum (ha)	.	.	.	.	69,300	10,000	.	.	.	.	.	.	79,300
Gambela	Count						21	121						142
	Sum (ha)	.	.	.	.	.	311,580	217,600	.	.	.	.	.	529,180
Harari	Count						1		2					3
	Sum (ha)	.	.	.	.	.	4,000	.	3,400	.	.	.	.	7,400
Multiregional	Count						131							131
	Sum (ha)	.	.	.	.	.	3,400,625	.	.	.	.	.	.	3,400,625
Oromia	Count						212			196				408
	Sum (ha)	.	.	.	.	.	3,264,043	.	.	162,497	.	.	.	3,426,540
SNNPR	Count						59				336			395
	Sum (ha)	.	.	.	.	.	470,439	.	.	.	533,311	.	.	1,003,750
Somali	Count			1			4					1		6
	Sum (ha)	.	.	379	.	.	8,500	.	.	.	.	500	.	9,379
Tigray	Count						22						198	220
	Sum (ha)	.	.	.	.	.	74,830	.	.	.	.	.	128,683	203,513
Total	Count	9	62	1,249	51	16	571	121	2	197	336	1	198	2,813
	Sum (ha)	25,000	253,397	1,361,909	168,796	69,300	8,486,766	217,600	3,400	162,697	533,311	500	128,683	11,411,358

Data set: EIA 2011b

2.3.3 Cross-checking data in Ethiopia: does supply meet demand for land?

Using questionnaire responses from all regional investment offices branches, the Ministry of Agriculture central and regional offices, and the prime minister's office, information was collected on active projects, and land earmarked for future investments. Earmarked land is usually reserved by the Land Bank at the Ministry of Agriculture and Rural Development. This survey from March 2011 reported a total of 5.7 million hectares of potential land for large-scale commercial agriculture in all of Ethiopia. Out of this area ca. 900,000 ha or 16% had been leased out at the time of the survey, which indicates that the government is still holding a large amount of land available for future investments. Figure 2.3 presents the amounts of land that has already been leased and remaining investment opportunities.

Figure 2.3 Agricultural land earmarked for investments in Ethiopia by region (March 2011)



Data set: (PMRA 2011), Data obtained through survey questionnaire to prime minister's office and regional administrations, March 2011

Oromia, with a total area of land earmarked for investments of above 1.4 million hectares, has the most potential. However, Gambela and B. Gumuz, the two lowland provinces in the western part of Ethiopia have large areas earmarked, too. The Somali and Afar regions host 800,000 ha and ca. 600,000 ha of earmarked land respectively. However, both of these eastern regions had only leased out very minor shares of their potential areas (Somali: 591 ha; Afar: ca. 22,000 ha). The SNNPR, Amhara and especially Tigray seem to have almost reached their potential, with only the SNNPR having a significant amount (140,000 ha) remaining for future investments.[118]

It is important to understand that this data from the prime minister's office, the Ministry of Agriculture and Rural Development, and the regional administrations, is only partly comparable

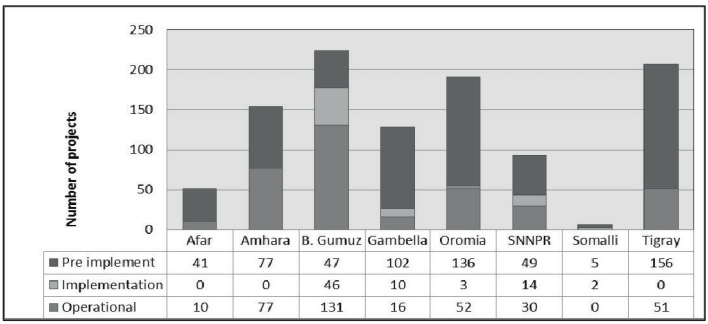
[118] The identification process for potential agricultural investment land was not fully completed at time of data collection.

with the data from the Ethiopian Investment Authority (EIA 2011b) presented in the above two sections.

To compare the status of projects across regions, I used information obtained from the prime minister's office and the regional administrations. A total of 1,055 large-scale commercial farms existed across the country, including those were already fully operational as well as those in planning (pre-implementation) or starting up (implementation). Unfortunately it was not possible to gather detailed information on the sizes or other characteristics of these farms.[119] The number indicated here is much lower than the number of project licenses listed by the EIA (2011b). In this sense, survey data confirmed only 1,055 projects of the 2,813 listed in EIA data (73,5%) and even less area under cultivation: 900.000 ha versus 11.4 mio ha demand in EIAb (8.9%). This might have three explanations: projects that were planned or implemented might have gone bankrupt; the regional and federal personnel contacted may not have been aware of all projects in the country; and many projects that initially requested a license may have never proceeded to pre-implementation status, even though they are still listed in the national data base.

Given these data quality problems and differences in the units of observation, comparing the two datasets is only partially possible. Unfortunately this is also true for the numbers reported below (Figure 2.4).[120] Within each region, however, the results illustrate investment activities.

Figure 2.4 Status of investment projects in Ethiopia by region (number of large-scale projects)



	Afar	Amhara	B. Gumuz	Gambella	Oromia	SNNPR	Somalli	Tigray
Pre implement	41	77	47	102	136	49	5	156
Implementation	0	0	46	10	3	14	2	0
Operational	10	77	131	16	52	30	0	51

Data set: PMRA 2011

[119] It is therefore likely that these numbers also include commercial farms that are using land intensively, such as horticulture and floriculture producers. It is thus not guaranteed that they always exceed the lower cut-off point of 100 ha, some may be even smaller.

[120] The survey was conducted with substantial investment of time and social capital, and is believed to be a good representation of actual investment activities. It is also true, however, that the quality of information differed by region depending on the willingness of the relevant partner answer the questionnaire. Therefore, comparisons across regions (e.g. number of projects) are only possible with limitations.

The operational investments (bottom row/dark grey section of the graph) account for half of the total projects in B. Gumuz and Amhara. For Amhara this might be explained by the region's relatively long history of investment. For B. Gumuz this is more surprising, as it was classified above as one of the regions where much more recent investment activities were observed. However, some investments there were registered in the early 2000s and late 1990s, which may be the ones that were already operational. In Gambela, Oromia and Tigray, most projects were still in the pre-implementation phase, with significant shares of projects already operating. Afar hosted a smaller share of projects in operation and several in pre-implementation stage.

As discussed in section 2.2, land can be allocated by federal or regional agencies. During field research in the Gambela region, I accessed data from the regional investment office that includes information on how much land was requested by investors and how much had already been allocated. The dataset began in 1991, but with the exception of a hand-full of cases in the late 1990s and early 2000s, investment activities in the western regions only began after 2004–05. The period from 2004 until mid-2010 therefore accounts for the vast majority of the cases displayed in Table 2.9 below. The table lists the five *woredas* (districts) of the Gambela region with land acquisition investments by domestic and foreign investors.

Table 2.9 Investments by district level in the Gambela region of Ethiopia: 1991–Aug 2010

District	# of Investments	Hectares requested (demand)	Hectares allocated (supply)	% of demand met
Abobo	63	146,350	61,270	41.9%
Gambela (semi-urban)	93	172,740	38,650	22.4%
Godere	3	11,588	11,588	100.0%
Dimma	5	8,000	6,100	76.3%
Itang	12	41,900	12,100	28.9%
Total	**176**	**380,578**	**129,708**	**34.1%**

Data set: Gam EIA 2011; Data obtained from Gambela Investment Bureau, Aug 2010.
Note: This table only lists investments handled by the regional office. Many of the very large projects in Gambela (e.g. Saudi Star, Karaturi) were not included here because they were negotiated at higher government levels and/or obtained multi-regional licenses.

Most investments were located around the regional capital Gambela Town. This is likely due to better access to infrastructure and labour in that part of the region, while other *woredas* tend to be less developed and have smaller populations and labour markets, which may imply labour shortages during harvests.[121] The total area requested by 93 investment projects in the Gambela *woreda* was 172,350 ha, however, only 38,659 ha (22.4%) were approved. A similar pattern was observed for Itang, and even in the Dimma and Abobo *woredas* a good share of the land

[121] Large areas of Ethiopia, as in many other African countries, are very sparsely populated, thus making labour the scarcer factor (when compared to land).

requested was not allocated. Only the three projects in Godere received the full amount of land requested.

This indicates an important finding that is missing from much of the discussion on LSLAs: the local governments, at least for the period documented here, assessed the capabilities of investors and their business plans. Following assessments they provided land, often less than what was initially requested by the investor. For the Gambela region overall during the period from 1991 until mid-2010 only about one-third of the requested land (demand) was actually provided to investors, indicating a rather conservative practice of appropriating land. In interviews with local officials at the Investment Office and the Office for Agriculture and Rural development, it was reported that this was also motivated by concerns about over-stressing the existing local production system with too much modernised production. However, in 2010 the governance of land within the region changed, following increased political attention to the whole trend on the federal level since 2007–08. The regional president's office established a secretariat to handle large-scale land leases. Such a transfer of responsibilities to the president's office indicates the growing political relevance of the issue.[122]

2.3.4 Taking stock: the extent of large-scale investments in Uganda

There is little comprehensive information on the scope of LSLAs in Uganda since the food price crises in 2007. Early reports warned that the 'land grabs' would "*[…] grow as a cancer […]*" and were likely to affect many people in Uganda (Mabikke, 2011, p. 12). One influential report on Uganda initiated by the Global Land Project (GLP) in Copenhagen (Friis & Reenberg, 2010) analysed data compiled by the International Land Coalition (ILC) and existing media reports listed in the database on land transactions in Africa. The investment projects were classified according to their recipient country, with data on investor, size, status of deal, crop type, purpose of investor and date. They found reports of 395 projects in 236 articles between August 2008 and April 2010, including repetitions. That data was cross-checked with three other data sources,[123] resulting in 177 cases in 27 African countries (Table2.10). For Uganda, they found seven projects with a total area ranging 1.0–1.9 million hectares. Using land-cover data from the FAO, this converted to ca. 14.6% of the agricultural land under transaction.

[122] About at the same time the MoARD established the AISD (see discussion in 3.2).

[123] The International Food and Policy Research Institute (IFPRI) data compiled by von Braun and Meinzen-Dick (2009), the online-data base maintained by GRAIN international (GRAIN, 2008), and available information compiled by GTZ based on the IIED, IFAD, FAO (Cotula et al., 2009) and GTZ-in-country experiences.

Table2.10 Large-scale land acquisitions in Africa as reported by the media (August 2008 to April 2010)

Host country	Number of deals	Magnitude (1,000 ha)		Ranked	
		Min	Max	by count	by size
Ethiopia	26	2,892	3,524	1	4
Madagascar	24	2,745		2	5
Sudan	20	3,171	4,899	3	3
Tanzania	15	1,717	11,000	4	9 (2)
Mali	13	2,417	2,419	5	6
Mozambique	10	10,305		6	2
Uganda	7	1,874	1,904	7	8
DR Congo	6	11,048		8	1
Zambia	6	2,245		8	7
Nigeria	6	821		8	10
Senegal	5	510		9	11
Malawi	5	307		9	12
Ghana	5	89		9	13
Total (all 27 countries)	**177**	**51,415**	**63,111**		

Source: Table 1, GLP Report (Friis & Reenberg 2010, p.11).
Note: The 13 main recipient countries listed by number of deals and having two estimates for the magnitude of all the land deals in each country. Based on screening and triangulation of GRAIN (2008), von Braun & Meinzen-Dick (2009), and Görgen et al. (2009) deals cover the period from 2007 until early 2010.

Zeemeijer (2012) validated media-reported projects in early 2011 and found 24 deals that amounted to a total of 1.23 million hectares requested or under negotiation. Out of these 24 cases, 13 were at least partly Ugandan, indicating the importance of domestic investors' role in understanding the dynamic in Uganda.

I used the data compiled by Zeemeijer (2012) and grouped investors by country of origin. Media reports included the most of the land (ca. 94%) requested by foreign investors or joint ventures (Table 2.11). However, Zeemeijer also consulted key informants in Kampala and travelled Uganda to validate the existence of project sites in six provinces and 13 locations and interviewed stakeholders involved in the projects (such as farm managers, key stakeholder).[124]

The right side of the table includes cross-checked deals. Out of the entirely foreign investments, which accounted for up to one million hectares of land, seven were non-existent. For four of the projects no information was available and validation was impossible. Two of the five joint investments were confirmed, although only 15% of the mentioned area can be considered under negotiation, implementation or operation. The eight domestic large-scale investments were all confirmed. Overall, only slightly more than 7% of the land reported, or the amount of 88,823 ha

[124] Thus, the validation process is very credible, even though Zeemeijer could not always verify the correct size of the investment projects.

were confirmed through field visits.[125] Of this confirmed area under large-scale production, 86% was operated by Ugandan investors and all had Ugandan partner. This suggests that media reports, at least in the case of Uganda, may have overestimated the extent of LSLAs. The number of deals could not be confirmed in this empirical validation. Even more impressive is the very marginal share of land (7% of total reported land) that could be confirmed. However, there remains a limitation, as Zeemeijer was not able to visit all projects. Plus, it could be that media is not covering all deals, as some might happen without notifying the public. One way to further double-check the extent and types of investments is to analyse official data.

Table 2.11 Validation of projects in Uganda reported by the media until May 2011, by origin of investor

	Reported in media		Cross-checked in field (Zeemeijer, in 2011)*			
Origin of investment	Nr. reported	Size reported (ha)	Nr. confirmed	Nr. not confirmed	Size confirmed (ha)	Share of reported area confirmed (%)
Foreign	11	1,066,523	0	7	0	0%
Joint	5	84,312	2	0	12,512	15%
Domestic	8	76,311	4	0	76,311	100%
Total	24	1,227,146	6	7	88,823	7%

Source: Based on data from Zeemeijer (2012), Friis & Reenberg (2010)
Note: *I was in consultation with Zeemeijer during my field work regarding a number of projects. Media reports cover the period between 2006 and May 2011, validation was not possible for many projects (4 foreign, 3 joint, 4 domestic)

The UIA was the only institution able to provide data on what they labelled *Large Agriculture Projects licensed by UIA*.[126] The data was from April 2011 and lists nine cases that are all operational. Table 2.12 presents their locations, operational status as well as available information regarding land size granted, capital invested and permanent employment created. The data does not show whether companies were operating at full-scale, though, nor does it provide any information regarding temporary employment, which might be significant.

Based on the information obtained, I calculated capital invested per area and found that most companies had to invest between US$ 1,000 and US$ 2,000 per hectare. The higher average figure of above US$ 3,000 is driven by very large capital investments made at Kakira Sugar

[125] Bearing in mind the limitations, that the actual size of the investment could not be double-checked in all cases, this number could still be an over-estimation, as I assume media reports would have used the largest reported number to catch more attention.

[126] During my stay in Kampala I invested a significant amount of time seeking access to country-wide information regarding large-scale farms, land prices, and/or farm structure (i.e. holding size, yields, etc.). This effort proved extremely difficult. Despite support of a local supervisor, no coherent data was available.

Works.[127] If I exclude this case, it reduces investments to US$ 1,130 per hectare. Labour intensity measured in permanent staff employed per hectare ranged widely across crops. Tea and sugar plantations were highest on average with 0.81 to 1.24 workers employed per hectare. For rice[128] and palm oil figures were lower (around 0.20 workers per hectare). The relative higher labour intensity correlates with relative higher capital intensity per hectare.

Table 2.12 Characteristics of operating large-scale agricultural companies in Uganda, based on official data from April 2011

	Information provided by UIA, 2011						Own analysis	
Name of Investor (contact)	**Invest-ment Activity**	**District of Invest-ment**	**Invest-ment Status**	**Land size granted**	**Capital invested (Mio US$)**	**Perm Empl.**	**Capital invested per ha (US$ 1000/ha)**	**Perm Empl./ha**
BIDCO	Palm oil	Kalangala & Jinja	operat.	10,000	9.76	2,569	0.98	0.26
Tilda Rice	Rice	Bugiri	operat.	14,000 *(3,900)	3.76	780	0.27 *(0.96)	0.06 *(0.20)
Kaweeri Coffee Plantation Ltd	Coffee	Mubende	operat.	2,500	4.21	-	1.69	n.a.
A.K. Oils and Fats (U) Ltd	Edible oil	Lira & Masindi	operat.	-	6.15	183	n.a.	n.a.
Kakira Sugar Works	sugar	Jinja	operat.	** *[9,700]*	101.54 **	7,222 **	n.a. *[10.47]*	n.a. *[0.47]*
Kinyara Sugar Ltd	sugar	Masindi	operat.	14,000	5.13	2,957	0.37	0.21
Sugar Corporation of Uganda Ltd	sugar	Mukono	operat.	8,000	15.46	6,489	1.93	0.81
McLeod Russel (U) Ltd	Tea	Kyenjojo	operat.	4,300	9.57	5,320	2.23	1.24
Rwenzori Commodities Ltd	Tea	Kabalore	operat.	-	5.52	1,636	n.a.	n.a.
		Comparison		**Total**	**Total**	**Total**	**Avg.**	**Avg.**
9 cases		UIA data		52,800	161.11	27,156	3.05	0.51
8 cases		** w/o Kakira			** (59.57)	** (19,934)	**(1.13)	**(0.38)
9 cases		*[w Kakira data]*		*[62,500]*	*[161.11]*	*[27,156]*	*[2.56]*	*[0.43]*

Source: Information provided by UIA, 2011
Note: * Tilda operated on only 3,900 ha; ** Kakira's capital invested seems to be an outlier, discussed below; numbers in () exclude the Kakira case; according to company information Kakira operated on 9,700 ha with and additional sum 18,000 ha under contract farming.

In-country analysis of on-going large-scale farms (Zeemeijer, 2012) and official data indicated a high share of domestic investors among the farms that were operational in 2011. To understand the trend of large-scale agriculture in Uganda, it is relevant to investigate the history of these existing cases.

[127] Kakira operates a contract farming scheme with over 6,000 producers on ca. 18,000 ha. This partially explains the large amounts capital invested and labour employed.

[128] Tilda Rice had 14,000 ha of land granted, including the planned extension beyond the 3,900 ha under cultivation. I corrected the figures and report them in the parentheses.

To start, I grouped the cases obtained from UIA and complemented it with additional information on the ownership structure and history of these companies (Table 2.13). Looking at the history of the investments, they can be grouped into four groups (1st column): the first group of investments date back to the 1920s (colonial times) and were founded by migrants from India (Madhvani and Mehta group). Both properties had been expropriated during the Idi Amin regime, but managed to regain ownership over (parts of) their property under Museveni's rule in the late 1980s. The second group has also old roots, reaching to government schemes initiated after independence (1960s). Both cases were privatised in the mid-1990s and are now private companies or public-private partnerships. A third group comprises large-scale agribusinesses that are part of the Mukwano group, a Ugandan business family that owns a number of companies that include processing and manufacturing. The fourth group encompasses newer investments established between the mid-1990s and early 2000s. Only three of the nine reported cases can be considered *new foreign investments* in the sense that they recently started cultivating at a large-scale.[129] For the older investments, the nationalities provided by the UIA, do not always coincide with the information available from company sources.

A closer look at ownership structures reveals another interesting finding: older companies became increasingly *internationalised,* even though the link is not always clear. For the case of the Mehta group sugar plantation, UIA provided Bermuda as the nationality. The Mehta group was initiated by its founder, who migrated to Uganda in 1900 at the age of 13, but since the mid-1980s has grown into a multi-national company active in seven countries. Bermuda might be a tax haven where the company is listed. Similarly, for Mukwano the indicated nationality was Canadian—a link that could not be confirmed. Kinyara Sugar, a former state farm that was privatised and acquired by Kenyan investors, recently was taken over by a Mauritius based investment group, according to the company's webpage. This indicates that large-scale farms in Uganda active today, tend to have a long history lasting back to early days of independence or even colonial times. Nevertheless, they increasingly become privatized and foreign investors join.

Another finding from the review of available reports and company websites as well as reported by key informants during interviews and a visit to the BIDCO project; has been that the government was involved in the founding as well as current operations of many of these large-scale farms. In the case of Kinyara, government still owned 30% of the shares. In the case of BIDCO, the government found a taskforce comprising several government entities to identify

[129] Tilda would fall into the category of relatively new and foreign, but its roots go back to a Chinese rice production scheme initiated in 1968. The evolution of the project is discussed in Chapter 4.

sufficient land for the investment and future expansion. Tilda is currently cooperating with the MAAIF, NAADS and the Islamic Development Bank to expand production by 10,000 ha.

Table 2.13 Clustering of selected large-scale farms in Uganda by characteristics and investment history

#	Characteristics	Name of Investor (*Business Group*)	Year started	Ownership History	Nationality (UIA data)	Nationality (checked)
1	Old investments: Founded by Indian migrants (1920s) in Uganda (strong local relations)	Kakira Sugar Works (*Madhvani Group*)	1920s; recent form: 1985	Times of expropriation, now back to privatisation, part of mostly Indian based multinational conglomerates	Uganda	Uganda
		Sugar Corporation of Uganda Ltd (*Mehta Group*)	1924–1972; recent form: since mid80s		Bermuda	Uganda
2	Initiated by government 1960s, today: privatised or PPP (tendency: full privatisation)	Kinyara Sugar	Late 1960s, government; recent form: 1995	Originally government initiated farm today: Public-private, tendency: fully private	Kenya	Mauritius-based investment group
		Tilda	1968; recent form: 1996	Originally public, today private	India	India, UK
3	Part of large Ugandan business Group Mukwano	A.K. Oils and Fats (U) Ltd (*Mukwano Group*)	1990s?	Private	Canada	Uganda (no connections with Canada found)
		Rwenzori Commodities Ltd (*Mukwano Group*)	1991	Private		
4	"New" Foreign Investments	McLeod Russel (U) Ltd	1994	Private	India	
		Kaweeri Coffee Plantation Ltd (*Neumann Kaffee*)	Between 2001 and 2004	Private	Germany	Uganda daughter of German company
		BIDCO/Oil Palm Uganda (*WILMAR*)	2003 (Tender started in 1997)	Private/PPP; GoU has been involved in the foundation process of the company; IFAD supports outgrower	Kenya	Kenya; Malaysian mother company

Source: Compiled by author based on UIA supplied company data; up-dated information from Zeemeijer (2012), and company reports and websites

Domestic investors and the GoU were involved in most of the documented and confirmed large-scale farms in Uganda. This is consistent with an early assessment of the extent of 'land grabbing' of Mabikke: *"However, land grabbing is broader than 'foreign' land acquisitions; it involves the active role played by domestic elites, government bureaucrats, family members and clan heads who assume power and certainly misuse it to grab land from vulnerable groups."* (Mabikke, 2011, p. 13, own emphasis).[130]

[130] Mabikke (2011) documented encroachment on Northern Uganda smallholder land by local elites, the military, and to a limited extent by foreign investors.

2.4 Summary of observed trend and types of investments

2.4.1 Rather robust findings: what we can say

The first and most obvious trend in Ethiopia was an *increase in agricultural investments*, both in terms of number and land area requested. This increase started in 2004 following changes in government policy. There was a sharp upwards trend in 2007 that peaked in 2008 with more than 4.3 million hectares requested. While the media had reported steep increases in Uganda, most of the investments could not be confirmed. Of the 1.8 million hectares reported initially only a fraction (ca. 7%) was confirmed.

In Ethiopia, domestic investors accounted for the largest number of investment licenses requested—both for the recent and pre-2007 period. However, *foreign investments were larger than domestic ones*.[131] There was a large share of joint-investments involving Ethiopian partners, but starting in 2003, investments by foreigners exceeded domestic demand. The area requested by domestic investment projects only reached three million hectares out of the total requested area of 11.4 million hectares. In Uganda, a similar trend emerged from media reported deals. Foreign investments accounted for over 80% of the area accounted for by investment projects. Yet, in the cases that could be cross-checked, domestic and joint domestic-foreign ventures dominated. The historic review of companies revealed that some 'domestic' investors became increasingly internationalised, either by expanding beyond Uganda (Mehta group) or partnerships with foreign capital (Mukwano group). Thus, organisation structures of the agricultural investments are changing in both countries. While media reports tended to overestimate the extent of foreign investment, there were trends of increasing involvement of foreign capital in both countries. In Ethiopia there was a sharp increase in large-scale production, while in Uganda official figures stated that the area under commercial, large-scale production remained stable since the 1990s, which would indicate intensification.

In Ethiopia a regional shift of investment activities was apparent. While most investments were located in the highland regions of Amhara and Oromia recently investment in the western lowlands of B. Gumuz and Gambela increased. In these western areas land with development potential was available as indicated by the amount of land earmarked for future expansion.[132] This is consistent with descriptions of global trends of investor attraction to (i) areas close to markets and (ii) remote areas with potential for extensification.[133]

[131] Foreign licenses documented larger project sizes as well as most of the mega-size projects (above 10,000 ha).

[132] In the eastern parts of Afar and Somali, the supply of land was greater than the demand.

[133] See Figure 1.4 and related discussion on investments' location in the Introduction.

In Ethiopia, most foreign investments in agricultural land came from developed countries in Western Europe and North America, or from emerging economies in the Middle East and South Asia. China played a minor role. In Uganda, South Asian involvement persists from colonial times, and recent investments were from Asia (e.g. Wilmar, Malaysia; Tilda, UK/India) and Western Europe (e.g. Neumann Kaffee, Germany). Established investments rarely exceeded 10,000 ha, indicating that land availability limits the potential for mega-projects in this more densely populated country. In Ethiopia, especially in areas of low population density in the west, several very large projects requested 10,000 ha or more. This suggests that large-scale investments might be especially profitable in land-abundant settings and during times of opening the agricultural frontier (Deininger et al., 2010). However, none of these projects appeared to operate at scales beyond 10,000 ha, and questions of viability remain to be answered. The most cost-efficient size for large-scale production, where the internalisation of scale economies due to indivisible inputs is not yet outweighed by diseconomies of supervising hired labour remains a research question (Hayami, 2010). Optimal size not only depends on technology applied, but also on the functionality of surrounding markets for labour and other inputs.

In Ethiopia most licenses for domestic investors were issued by the region where the investment occurred. In both countries, foreign investors primarily interacted with federal agencies. In both countries, the governance over LSLAs was increasingly the responsibility of the highest levels of federal and regional governments.[134] Meetings between investors and ministers are not the exception, and in Ethiopia the establishment of a federal agency responsible for foreign investments in commercial agriculture reflects the increasing importance that the government places on these projects.

The regional level data from Gambela showed that the demand for land was only partially met by the land provided through the local government. For the projects that were processed through regional authorities, on average only about one-third of the acreage requested was actually allocated. It remains to be seen whether higher government levels are as conservative in allocating land as the regional governments. Statements by regional officers underlined their dedication to considering smallholder interests. Federal level agencies located in the capital are more remote from and likely less aware of smallholder interests and may bias their policies and practical decisions towards the interests of large-scale investors. This presents the danger of

[134] In Uganda the government was sometimes involved in the allocation of land to investors, as the case of BIDCO illustrates, where a task force was created to accumulate the requested 10,000 ha on Kalangala Island. Currently the GoU, together with IFAD is trying to repeat the Kalangala project on another island closer to the coast (Buwuna) but faces several challenges since land-owners seize opportunities of rising land prices and resist to sell land to GoU.

encouraging investment in LSLAs at the expense of food security and smallholder livelihoods (HLPE, 2013).

2.4.2 Less robust findings: what was indicated

Conclusions about the status of projects are of limited reliability. In Ethiopia the data on operational projects indicate that ca. one million hectares are under commercial agriculture, while the total demand appeared to have reached over eleven million hectares. This may also indicate that less than 10% of investment projects initiated were operational. It is possible that many investors have not yet begun the process of land acquisition—which would be the point at which that they are registered with the regional administration bureaucracies. It was mentioned at EIA that potential investors often procure licenses in order to extend their business visas in Ethiopia without truly planning to make those investments. However, this alone seems unlikely to explain the entire discrepancy. Failure and bankruptcy of projects could be another explanation for the discrepancy; however, no information on failed or cancelled projects was available. Estimates on sectorial failure for Ethiopia report a survival rate in the manufacturing sector of about 30% since the mid-1990s (Sutton & Kellow, 2010), and historically survival rates for large-scale agricultural ventures tend to be even lower. Deininger et al. (2010) state a survival of 20% (no time specification given). Tyler and Dixie (2013) are slightly more positive and found survival rates of up to 70% among investments in agriculture done through the Commonwealth Development Cooperation (CDC). However, many greenfield investments seemed to fail, while rehabilitation of existing cases were more promising according to their data. Case evidence from the Gambela region indicates that many investors might never reach full operational size (Karaturi Investment), or else they need a significant amount of time to do so (Saudi Star).[135] In Uganda most foreign projects featured by the media were not found to be operational or even at the implementation stage. For most of these, no license with the UIA (a precondition for initialising investment activities) existed. However, some media reports presented proposed investments which may still materialise. In addition, media reports by local newspapers and interviews with local authorities indicate significant involvement of Ugandan politicians in the accumulation of farmland in some parts of the country. However, these holdings, while partly used as farms or rangeland are not classified as commercial agricultural entities and thus are not included in official figures. Uganda data

[135] In 2007 the Indian investor Karaturi obtained a lease for an area of 300,000 ha in the Gambela region that was downgraded to 100,000 ha in 2010. In the summer of 2013 the Ethiopian government discussed withdrawing all of this land because the investor is unable to develop the land as proposed. Saudi Star has leased 10,000 ha since 2008 but only operated on 400 ha as of the spring of 2013, suggesting that time is required to establish on-farm infrastructure (irrigation canals, roads, etc.) (see Chapter 3 for more details on the Saudi Star case).

showed that investments of more than US$ 1,000 per hectare were required for permission to establish large-scale farms. However, neither aggregated information on outputs nor operational costs were provided. Thus, since global market structures within the food system changed and might have affected profitability the profitability of large-scale farming, especially in comparison to small- and medium-scale operations remains an area for further research (von Braun & Mengistu, 2009).

2.4.3 Limitations and further research: what we cannot say

Data accuracy remains a major challenge. As described initially, the Ethiopian dataset used for the analysis only lists the amount of land *requested*. It represents investor demand for land, however, it does not represent actual financial or agricultural activity. The information obtained from survey questionnaire responses by personnel from the regional administration and prime minister's offices indicated a much lower amount, both in number of projects (ca. 37,5%) and acreage under cultivation or negotiation (ca. 9%).

On the other hand, official data provided by the UIA in Uganda might not accurately reflect projects that have failed or were only planned. It therefore is an illustration of the supply side, but might underestimate intentions of both foreign and domestic investors to extend large-scale production in Uganda. As domestic investors can complete land transactions privately and land holdings are not listed centrally in Uganda, no detailed information on farm sizes or investment structures was available. The UBOS data on commercial farm acreage implied almost two decades of stability, which may indicate a lack of information increasing area of commercial agriculture production.

In Uganda the threat of 'domestic land grabs' were brought up in the news media and in some early case studies (Mabikke, 2011). The high share of Ugandan investors among the currently active large-scale farms underlines domestic participation in this sector. However, there is little information on the differences between the impacts domestic versus foreign investors. This leaves room for further empirical studies.

Finally, the above discussion centred on size characteristics of land investments. This makes sense with regard to the question of how much land was requested, and by whom and where it was allocated. However, employment creation, capital intensity, technology transfer and especially organisational structure are not necessarily related to size but yet are highly relevant for agricultural growth and socio-economic development. Thus, in-depth case studies are needed to better understand local level impacts of LSLAs.

2.4.4 Case Studies: locating the Saudi Star and Tilda Rice investment within the typology

As mentioned above (Section 1.3.3), has my case selection been based on a combination of practical and conceptual aspects. In addition, selection had to be made at a time when still little information on the extend and particularly status of investments was available. The fact, that I did select cases which already showed substantial activity on the ground has already led to a bias away from those LSLAs with pure speculative nature, where investors might purposely pretend that investments are delayed, but are actually not considering to further invest in the ground.[136] The other dimension that has pre-selected certain characteristics, is the crop rice. The dynamics of this labour-intensive food crop that can also be processed locally, thus allowing for side-selling and supplying local markets, triggers dynamics much different from industrial crops like cotton, palm oil, sugar cane or tea. Also the dynamics for biofuels and especially flex-crops might differ, given their strong reaction to global price and policy developments and potentially adverse impact on local food supply.[137] Similarly, the two cases selected show relatively low levels of conflict, and positive development outcomes. This is not the case for all LSLAs. For examples two studies initiated by the Welthungerhilfe (WHH) in 2011 in Sierra Leone and Cambodia indicate significant negative development outcomes and document much conflict surrounding the establishment and operation of a number of investments in these two countries (Bues, 2011b; Melsbach, Rahall, & von Oppeln, 2012).[138] Bearing these limitations in mind, the two case studies are still able to indicated some common aspects of LSLAs and subsequent investments. These include the different dynamics along the five impact channels selected, the variation of long and more short-term impacts, as well as the fact that the surrounding local population of any investment is not homogenous but that different segments can seize opportunities opening up, while others might be more likely to be threatened through the emergence of a LSLAs. Finally, the two cases selected (see Figure 1.3) are located in countries with relatively high yield gaps, and started off in areas that were relatively land abundant. Thus, the dynamics of a LSLAs are expected to be much different if these two dimensions differ (e.g. land-scarce, low yield gap).

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[136] To my knowledge no such case is well documented, but several authors refer to this type of investments (e.g. (Hall, 2011).

[137] A number of authors have highlighted the problematic nature of LSAIs focusing on biofuel production (Friends of the Earth, 2010; Mabiso & Weatherspoon, 2011; Zommers, Johnson, & Macdonald, 2012)

[138] For example, in Cambodia investors came and tricked local communities into giving up their land, celebrating a bit festivity, providing a cow and other food, and asking finally to sign a paper which was explained to entitle signatories to receive cloths from the investor, but turned out to be a lease agreement for their communal forest . I had been involved in the conception and development of methodology of these studies and thus give their findings higher credibility than some other NGO reports, which not always might have started with very objective approach towards the issue.

3 EARLY STAGE SOCIO-ECONOMIC IMPACTS OF A LARGE-SCALE LAND ACQUISITION IN GAMBELA, ETHIOPIA

3.1 Introduction and framing of analysis[139]

Large-scale agriculture investments bring about significant changes to local rural factor markets. By increasing local demand for labour, off-farm employment opportunities may increase, wages potentially rise, new inputs might become available, or conversely—if scarce—local prices might rise. In addition the appearance of a large-scale commercial farmer will affect local infrastructure and create new demand for services (food, beverages, clothing for workers, etc.). On the other hand LSLAs reduce locally available land, which in many cases disrupts traditional land use for less intensive activities such as hunting or gathering forest products.[140] Local effects of LSLAs can be summarized in the following steps:

(i) Increasing demand for land and labour inputs leads to changes in prices of these factors in local factor markets (assuming they exist) or to the establishment of exchanges for these factors (in the absence of markets/ market failure)

(ii) Price changes for agricultural and non-agricultural inputs (some of which might only then start to become available) and access to new technologies

(iii) Increasing demand for outputs due to increasing population (due to local immigration response to increased employment opportunities) and increasing income/cash availability (leading to more off-farm jobs; potentially reducing domestic food production)→increased commercialisation of local agriculture

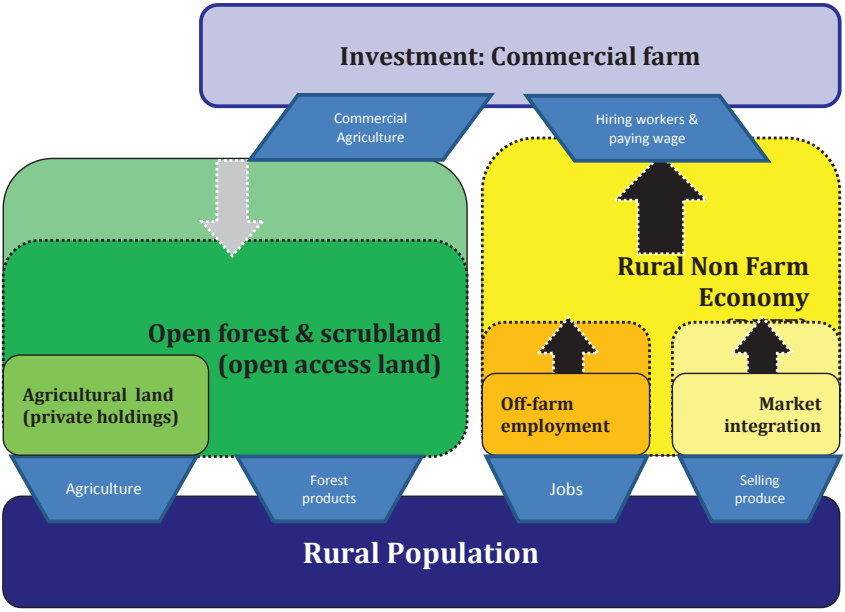
Figure 3.1 depicts changes at the local level: At the initial stage, local people use agricultural land for cultivation, and open access scrub and forest for grazing livestock and to gather forest products (fruits, timber, fuel wood, etc.). Furthermore, locals rely on some non-farm economic activities, such as wage employment (off-farm work) and on-farm businesses, vending, etc. Through the legal transaction and physical preparation of land by investors, previously open-

[139] Parts of this chapter are published as a journal article in *World Development* (Baumgartner, von Braun, Abebaw, & Müller, 2015).

[140] Furthermore, the arrival of new workers and engineers will affect the bargaining power of locals with respect to the distribution of scarce resources, political positions, etc.

access land is re-allocated and the local population lose access to it (grey arrow). At the same time, demand for labour increases and more economic activities boost the local non-farm economy (black arrows). The investment engages in commercial agriculture on the prior forest/ savannah land and requires labour and services from the local rural economy. The local population continues to derive agriculture produce and forest products from private and communal land, and also supplies the rural non-farm economy with services and labour. The local population also consumes locally produced goods and services and hires other community members.

Figure 3.1 **Conceptual framework of interactions between large-scale commercial agricultural investments and local context**



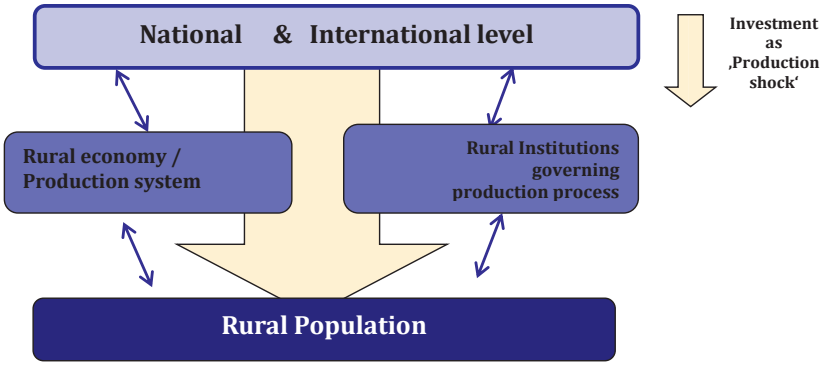
Source: author's compilation. *Note*: size of agricultural land cultivated by smallholders is not immediately affected by the investment.

The objective of this research is to evaluate the (potential) impacts that LSLAs can have on poverty reduction among local smallholders and rural population. The impacts are expected to occur along several channels. In the following case study, I evaluated the potential future impacts of one early stage large-scale land investment on the local communities. More precisely I addressed the following five research questions:

1. How has this investment affected **income poverty** levels in the local population and what are the **distributional effects**?
2. What affect has the investment had on the **livelihood strategies** of nearby rural households and what changes have occurred with respect to the **combination of activities** to generate a household income?
3. What have been the effects of this investment on **agricultural production**, and through which production factors do they occur?
4. How has this investment affected **off-farm employment** opportunities?
5. What effects has this investment had on the **shadow-price of land** and other resources?

The inception of the investment can be conceptualised as a 'shock to the local rural economy' that induces a structural change (Figure 3.2). The outcome of this 'production shock' is influence by (i) national and international level institutions (e.g. investment policies); (ii) by the rural economy and its production system (e.g. technology used); (iii) the capacity, function, and characteristics of local institutions that govern the production process (e.g. land right regimes); and (iv) rural poor are affected by the shock and will (have to) find strategies to adjust accordingly.[141] This can also lead to feedback.[142]

Figure 3.2 Conceptual framework of LSAI as production shock to existing rural economies



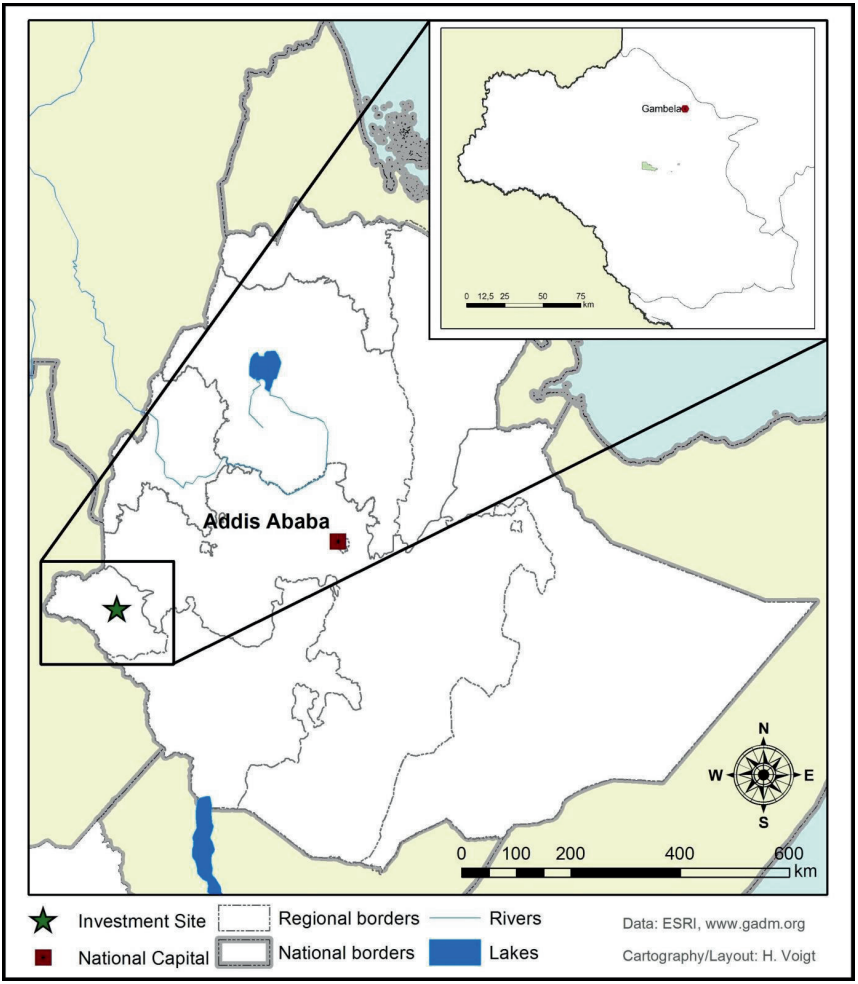
Source: author's compilation

[141] In Ostrom's (1990) analytical framework the shock shaped the constitutional level (national/international actors), and influences the collective and operational level actions of local populations.

[142] See also the extended discussion on conceptual framework in section 1.3.

3.2 Context of the case study

Figure 3.3 **Political map of Ethiopia with the location of the Gambela region and the investment site**



3.2.1 Characteristics of the Gambela region

Gambela is one of Ethiopia's poorest regions, with 34.9% of the population in the lowest wealth quintile in the country.[143] In addition, wealth is unequally distributed: with a value of 0.29 it had the highest regional Gini coefficient (together with Afar) in the country (CSA, 2012a). Gambela is located in the western lowlands and borders South Sudan (Figure 3.3). Agro-ecologically it is characterised as *Bereha* (hot lowland) (see also Table 7.5 in Appendix). The main rainy season starts in April or May with heavy rains continuing through August and ending in September or October, followed by a dry season from November through February, and a second shorter rainy season (*Belg*) in February or March that sometimes allows for a second short planting period (Tadesse et al., 2006).

In Gambela population density is low, ranging only 3–27 people per km^2 in 2005 (Figure 3.4). The region had a total population of 306,916 in 2007 that accounted for 0.4% of Ethiopia's total population,[144] however, it is the region with the highest population growth rate (4.1%) between 1994 and 2007. One quarter of Gambela's population lives in urban areas (Census Commission, 2008). According to the national statistical agency's land use statistics, the region accounts for a very small share of the nation's cereal production: 0.11% in 2009 and 0.14% in 2008 (CSA, 2010a). Compared with its population share of 0.4% this indicates a high level of subsistence agriculture and very little market integration.[145] In 2002 more than 97% of Gambela population was fully engaged in agricultural activities (the highest rate in the country) (Tadesse et al., 2006).

Within Gambela lies the *woreda* of Abobo, which had a population density of 5–6 people per km^2 in 2002 (Tadesse et al., 2006). According to national statistics, average cultivated area per household in Abobo was between 0.7 ha and 0.8 ha. Most cultivation activities take place during the main rainy season, with only below 8% in the secondary rainy season (Tadesse et al., 2006). Major crops are cereals (maize, sorghum) with permanent crops such as coffee accounting for 0.5–2.0% of area cultivated (the national average ranges 2–7.5%). Cattle ownership is lowest in this part of the country, with less than 60% of households reporting cattle ownership and relatively few cattle among those households that did report owning cattle (< 3.1). Most

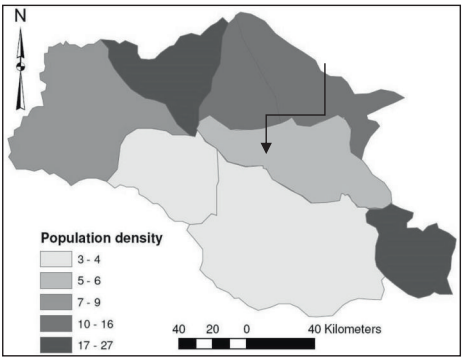
[143] For a more detailed discussion on wealth ranking see the relevant sections in the 2011 Ethiopia Demographic and Health Survey (CSA, 2012a).

[144] Population density in Ethiopia varies significantly across regions. The highlands are more densely populated, hosting about 85% of the national population on only about one-third of the country's area. Census data indicate that average density grew from 34 inhabitants/km^2 in 1984, to 48.6/km^{2}in 1994, and 67.1 in 2007 (CSA, 2012a).

[145] Less than 5% of Gambela's total land area is held by small-scale producers (Tadesse et al., 2006).

livestock in the area are goats and chickens (Tadesse et al., 2006).[146] There are two main groups among the local population: the Anyuak, an indigenous Nilotic ethnic group, and settlers from the Ethiopian highlands who moved there in the late 1980s. These two groups live in distinct villages and differ with regard to agricultural practices, religion, and culture.

Figure 3.4 Population density across Gambela districts in Ethiopia: 2008[147]



Source: Data was derived from the Gambela demographic and health survey from 2005.
Note: The black arrow indicates the approximate location of the LSAI in the Abobo *woreda*.

The combination of semi-arid climate and low population density allows for some generalizations about the behavioural and material determinants of the local agricultural production practices. Table 3.1 lists the assumptions about the initial stage settings based on Binswanger and McIntire (1987) with a description of the degree to which they held for Abobo prior to the arrival of the LSLA.[148]

[146] It is important to distinguish this part of the Gambela region from the Nuer area, where livestock ownership is much higher.

[147] Available at http://www.ethiodemographyandhealth.org/Gambela.html.

[148] Here I apply a deductive approach and general theories on the local context. This contrasts with the more inductive approach followed in Chapter 4 on the LSLA in Uganda.

Table 3.1 Material and behavioural characteristics of agricultural production in low-population density, semi-arid tropical areas of Gambela, Ethiopia (prior to investment project—initial stage)

	Initial stage assumptions about agricultural production (from literature)	Context Abobo *woreda* (case study)	Validity for both socio-ethnic groups		
			Group 1 (Indigenous Anyuak)	Group2 (Settler/ Highlander)	Sources
I-1	**"Population density is low**; therefore, cultivable land is abundant and has no sales price."	5–7 person/km²	Yes	Yes	* ,+
I-2	**"Indigenous populations have access to land-use rights at no cost** or in exchange for token payments. External powers have not created property or user rights for expatriates."	Anyuak: clear new forest patch every 3–4 years (shifting cultivation) Highlander: maintain permanent plots, sometimes registered	Yes	Yes (two waves of land certification)	#, a
I-3	**"Arid climate and crop production**: (a) Seasonality is pronounced because, in the absence of irrigation, there is one short growing season. (b) Weather risk is high. (c) Yield risks are highly covariant within small areas."	Rainy Season: May–August Severe drought in 2008, that affected most households	Yes	Yes	*, #, b
I-4	**"Arid climate and animal husbandry**: (a) The cheapest way of producing cattle usually involves transhumance, the seasonal migration of cattle among different geographic subzones. (b) Animal husbandry has lower production risks than cropping. […] (c) Covariance between animal husbandry and crop production is lower than the covariance of yields among different crops […]. Secular droughts imply failure of both crop and animal husbandry enterprises."	Anyuak traditionally limited livestock herding Highlander try to accumulate cattle, but no transhumance (both groups primarily own goats, chickens, highlanders own some cattle)	Few/no cattle (only 3% of households had cattle)	Few cattle	*, #, a, b
I-5	**"Technology is simple and confined to hand tools and, possibly, to draft animals**. Management skills are unimportant and technical economies of scale are limited. Gathering and hunting provide supplemental income to agriculture."	Prior to first state-owned farm, no mechanised agriculture in the area. Local farmers only use manual planting tool (*chala*–Anyuak) or oxen plough (Highlander)	Yes; Only manual planting tool [*chala*]	Yes; Manual and Oxen-drawn ploughing	#, a, b
I-6	**"Transport and communication costs are high**; that is, the region is geographically isolated."	Along the main road, one bus per day. Several Anyuak villages without road access in rainy season. Lack of electricity and utility grid	Yes (very high)	Yes	*, a

Source: Information in the first column is from (Binswanger & McIntire, 1987, pp. 75–76), information in the second column is from (Census Commission, 2008[+]; Mengistu, 2005[#]; Tadesse et al., 2006[*]) group interviews [a], and the household survey [b]).

Consistent with economic theory and based on the initial conditions described in Table 3.1, twelve propositions (P-1 to P-12) about local agricultural production (prior to the arrival of the LSLA) can be derived (Binswanger & McIntire, 1987, pp. 76–80).[149] These propositions justify the behavioural assumptions within the model. Given the ready access to land (I-2) and simple technology (I-5), a worker's output would be at least as high on his own plot as on the plot of an employer. Thus, an employer cannot compensate a worker for his forgone output (given the costs for supervision), leading to the absence of a non-cultivating labour class and a very limited labour pool, limited to occasional group work in the off-season (P-1). During weeding and sowing activities there was practically no hiring or exchange of labour (P-2).[150] Because of geographic isolation (I-6), trade was restricted to low weight items and self-sufficiency in the production of agricultural and non-agricultural commodities is high. Consequently, there was no regular output market every year, as most famers were self-sufficient in food production (P-4). Area cultivated per household directly reflected household size or wealth (P-3). Limited durability of food grains and the risk of weather shocks made long-term storage and accumulation of commodities unattractive. Thus, once output levels provide for self-sufficiency there was little incentive for extra effort (P-5).

Credit and insurance markets were absent. Given limited output markets and the absence of labour markets, neither market-credit nor labour-credit links can serve as collateral. Limited options for use as collateral therefore reduced the availability of credit (P-6), and a lack of incentive for additional investment reduced demand for credit (P-7). Extended families and tribal groups serve as a safety net against specific risks, but cannot insure against covariant risks (e.g. drought) (P-8). Thus, capital accumulation was the major insurance substitute (P-9) and households must store their own food stocks (P-10). In the absence of output markets, the high cost of holding stocks, and self-cultivation, storage is bound by expected consumption and did not qualify as accumulation. The main means of capital accumulation were therefore livestock, gold, and jewellery (P-11). Beside this individual accumulation, common property resources provided an insurance substitute (P-12). These theoretical postulations about semi-arid agriculture production accurately describe the setting in Abobo before the advent of the LSLA.

[149] Here only a very short summary of these propositions is presented. For an extended discussion and more details on the derivation of each propositions see Binswanger and McIntire (1987, pp. 76–80).

[150] Exception to this occurs if a farmer cannot grow sufficient food during the peak season to sustain his livelihood and thus must enter a patron-client relationship with a wealthier household (Binswanger & McIntire, 1987, p77).

3.2.2 Case study: large-scale irrigated rice project

The LSAI is located in Abobo, approximately 80km southwest of the regional capital Gambela Town (ca. 40.000 inhabitants).[151] The Saudi Star Agricultural Development Plc. is a 10,000 ha irrigated commercial rice farm owned by MIDROC Ethiopia, part of an international umbrella company consisting of 41 companies that are active in all sectors of Ethiopia's economy and owned by an Ethiopian born Saudi, Sheikh Mohamed al-Amoudi. The investment contract signed in 2008 includes exclusive rights to the water from the Alwero dam. The lease price was initially 30 Birr/ha (US$ 1.8 or US$ ppp 9.50) per year but was revised according to the subsequent national pricing scheme to 151 Birr/ha (US$ 9.20 or US$ ppp 48.1) per year. In June 2009, Saudi Star began clearing the land and soon established a small nursery on ten hectares to test rice varieties and produce seeds. A team of Pakistani rice experts planned and organised the farm management, land clearing and levelling; and the construction of facilities was performed by Ethiopian sub-contractors and a Swedish affiliate company of the Saudi consortium. Another Pakistani company was responsible for the construction of the irrigation system.[152]

By early 2010 most of the land had been cleared (approximately 8,000 ha) and land preparation and construction on the irrigation canal began. Cultivation was initially planned on 300 ha for the second half of 2010, but due to problems with irrigation and flooding had to be postponed until March 2011. Production was to be scaled up to 1,000 ha after 2012, 4,000 ha after 2014, and 8,000 ha after 2015. Bottlenecks remain, including: (i) the irrigation canal; (ii) the availability of fuel and spare parts; and (iii) the availability of qualified labour, which is partly imported from highland Ethiopia and partly from Pakistan. In late 2010 the farm management was replaced.[153] A permanent complex with offices, workshop facilities, improved tents, houses, and a cantina were established (Camp Alpha).

The farm is expected to produce two-and-a-half harvests per hectare each year.[154] The investor has not yet determined the cultivation practices that will be used on the farm. The farm imported 400 tractors that had to be driven to the location during the first half of 2010 for land

[151] Abobo is ranked directly after the Gambela *woreda* as second most attractive for agricultural investment (see Chapter 2). In size it is also ranked second, after Itang *woreda*, where the 300,000 ha (currently 100,000 ha) Karaturi mega-project is located.

[152] In 2013, this company was the largest local employer hiring 600 workers in addition to 145 Pakistani employees. After a violent shooting in early 2011, all Anyuak employees were encouraged to leave or fired. Only a few that were particularly trustworthy were allowed to remain (based on interviews with former assistants working at the camp site, May 2013).

[153] Informal conversations with company staff revealed that low performance during the first three years lead to a reformulation of the operations plan and a reflection of the difficulties of implementing LSLAs in remote rural Africa.

[154] The rice variety cultivated requires ca. 100–110 days to mature, and three harvests may be possible in good years.

preparation. The decision to plant by either broadcasting or transplanting will have major impacts on the labour intensity of production and thus labour demand.[155] As of mid-2011 the availability of skilled labour remained a key constraint. In order to advance the project and have reliable skilled and semi-skilled labour, the farm evaluated cooperation with the local agricultural college to train rice experts who could later manage production activities.

3.2.3 Local livelihood strategies [156]

There are currently two main socio-ethnic groups living in the area: (i) highland Ethiopians[157] who were settled to the area under a *Derg* in 1984, and (ii) the Anyuak ethnic group that has lived in the lowlands of Ethiopia and Sudan for the last two centuries (Kurimoto, 1997). The Anyuak (indigenous) and the highlander (settler) account for 70% and 30% of the local population respectively. The two groups live in separate villages. The indigenous group mainly occupies river banks or areas where forest patches interface with open savannah or scrubland.[158] These dispersed settlements contribute to the isolation and self-sufficiency of these groups. Compounds are scattered and not necessarily socially cohesive (Mengistu, 2005).[159] The highlanders were settled in group villages and often allocated plots by local administrations. Their settlements tend to be bigger and more cohesive due to administrative structuring.[160]

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[155] Deininger et al. (2010) address the varying labour intensity depending on production practices. The estimates for average labour intensity per hectare (worker/hectare) ranged from more than ten in very labour intensive cases to 0.01 workers under mechanised farming (a factor of 10^3).

[156] In general, partly due to its remoteness, literature on Gambela is very limited. There are a number of relevant authors who have discussed local livelihoods (Dereje, 2006; Kurimoto, 1997; Mengistu, 2005). Their empirical research was mainly from the late 1990s. Between 1995 and 2003 violent conflict between the Anyuak and government forces was frequent and culminated in a shooting in December 2003, that left several hundred people dead (HRW, 2005).

[157] This group could be further disaggregated as they stem from different parts of the highlands. They are grouped together given their relative contextual similarity to one another and relative difference from the indigenous group.

[158] Prior to the 1980s government resettlement scheme, all land was considered communal and land disputes were unknown due to (i) low population density, (ii) simple technology constraining maximum use of land, (iii) absence of large-scale mechanised farms, and (iv) local elites lack of interest in the accumulation of large holdings (Mengistu, 2005). Thus, land was not scarce and did not have an economic value per se—only once land was cleared and prepared for planting (i.e. after labour investments) did land became valuable.

[159] Consistent with this description survey results showed that village level saving or insurance groups were more prominent among the settlers (mainly IKUB or funeral saving groups), while the indigenous participated less frequently in group memberships, although they did engage in IKUB to some degree (IKUB is a collective saving mechanism).

[160] Settlers were concentrated in two settlements: Village 17 and Abobo Town. The town (4,090 inhabitants) has a number of shops, restaurants and hotels, as well as a hospital and two offices of smaller non-governmental organizations (NGOs). The communal administration is also located in Abobo Town, being the largest employer prior to the arrival of the Saudi investment.

Table 3.2 presents the means by which households acquired their user rights to agricultural land. The data were derived from 154 plots under cultivation during the 2010 season in the area. Over two-thirds of the plots were established individually by farmers who cleared the forest (68%). This share was much higher among the indigenous group (81%) compared to the settlers (36%). About one-fifth of the plots had been allocated by local leaders or government agents. This practice was much more frequent among the settlers (62%), which is explained by the planned structure of settler villages. In addition, new parcels among the highlander settlements need to be allocated by village leaders. The land distribution system is more regulated and formalised among settlers. Among the indigenous only 3% of the plots were allocated by authorities. Inheritance of plots accounted for 12% and is more frequent among the indigenous, where it primarily occurs along patrimonial lineages, but some inheritance by women occurs (5%). Leasing land is quasi absent among both socio-ethnic groups. Only one plot was reported as leased. This indicates that land per se is not scarce and/or that a land market did not exist at the onset of the LSLA.

Table 3.2 Means of plot acquisition among the indigenous and settler groups, in Gambela Ethiopia: 2010

Categories	Legend	Indigenous	Settler	Totals
Inherited/gift	Frequencies	17	1	18
	Col. percentage	16%	2%	12%
Allocated by authorities	Frequencies	3	28	31
	Col. percentage	3%	62%	20%
Forest cleared (taken himself)	Frequencies	88	16	104
	Col. percentage	81%	36%	68%
Leasehold	Frequencies	1	0	1
	Col. percentage	1%	0%	1%
Missing	Frequencies	3	0	3
	Col. percentage	3%	0%	3%
Total	Frequencies	109	45	154
	Col. percentage	100%	100%	100%

Source: own HH-Survey (Jan 2011)

The indigenous people in Gambela practice shifting agriculture and live in traditional settlements. Manually cultivated areas are organised by small, individually managed plots in the forests and along the riverbanks. Interviews with agricultural extension officers in Abobo Town in 2011 confirmed that practices among the indigenous have not change significantly.[161] They apply zero tillage and do not use improved seeds or other modern practices. Weeds therefore remain a key obstacle to higher yields. The settler farmers plough using oxen on individual plots.

[161] The average holding was about 1.5 ha per household (slightly smaller than survey results ~1.8 ha).

Maize and sorghum account for the majority of crops, with some sesame and rice as cash crops. Both groups plant vegetables along the river to earn additional cash and supplement their diet during the dry season.

The local population engages in a diverse mix of livelihood activities in addition to farming. Cattle production is limited, partly due to an unfavourable climate, but also due to insufficient levels of income to purchase cattle. The extraction of forest products, fishing and self-employment contribute important household income shares (Angelsen et al., 2011; Mengistu, 2005). The rural non-farm economy (RNFE) is small, with a very limited labour market and a small amount of produce sold in local markets. The survey results indicated that less than 10% of the farmers hired additional labour for cultivation of plots, and the number of businesses in the small provincial capital Abobo Town is rather low (but recently growing). Studies by the Central Statistical Agency on farm management practices in Gambela revealed a very low share of farmers utilising modern inputs (CSA, 2012b).[162]

The RNFE was long neglected among policy makers and researchers, but has recently attracted considerable attention. In their broad review of existing evidence, Haggblade et al. (2010) consider the rural non-farm economy to include all economic activities other than the production of primary agricultural commodities. Analysis of over 50 rural households surveyed from the 1990s and 2000s showed that non-farm earnings accounted for 34–50% of rural household income across the developing world. The share in SSA was lower than in other parts of the world (average 34%).[163] There exists, however, significant variation across and within countries. In addition, the non-farm economic activities can have an equalising effect, if households with very little or no land improve their income through off-farm labour (Haggblade, 1989). In that way, the RNFE has the potential to elevate groups that otherwise would be below the poverty line, providing them income generating opportunities. However, comparative analysis revealed no consistent patterns, as in other cases the poorer were less likely to participate in RNFE activities (Haggblade et al., 2010).[164]

Even though it is not their primary economic activity, many rural Africans continue to obtain a major share of their subsistence needs from forest products (J. E. M. Arnold & Pérez,

[162] Extension service coverage was also very limited, leading to a lack of extension packages, access to credit, and advisory services (CSA, 2012b).

[163] For the included African countries, mean rural non-farm earnings accounted for 28% and remittances from migrant labour for another 6% of the total rural income, for a total share of 34% (Haggblade et al., 2010). See also additional information in Table 7.6 in Appendix.

[164] In some settings, aggregated non-farm incomes improved equity across household groups, in others they exacerbated inequality. Under other settings the relationship between household welfare and non-farm income exhibited a U-shape (see Table 8 in Haggblade et al., 2010).

2001).[165] Plants and animals from forests and woodlands are used for food, energy, medicine, fodder, housing, furniture, baskets, and tools. As Kaimowitz puts it: "*One typically thinks of these people as farmers, not foresters*" (2003, p. 46). Recent studies indicate that the returns to rural households from forest and woodland products on average are as high as 20% of the total household income. If environmental services are added, this increases to 25% (Angelsen et al., 2011). A second meta-data study found an average contribution of forest environmental income of 22%, with agriculture (crop and livestock) and off-farm activities accounting for 37% and 38% respectively (Vedeld et al., 2007).[166] Some authors therefore refer to the benefits of forest product use as the "*hidden harvest*" (Campbell & Luckert, 2002).[167]

Forest products are especially important for the poorest households. Typically women and children collect and consume or sell fuel wood, and food items, and also make handicrafts from forest materials. These activities not only provide limited income but women often depend on them for subsistence needs (Behrman & Meinzen-Dick, 2011; Dessalegn, 1988; Heubach et al., 2011; Meinzen-Dick & Mwangi, 2009). As displayed in Figure 3.5, higher income groups may depend more on forest products for income, while the poorest are more likely to use forest products for subsistence purposes. Also if an asset-based approach is used to cluster groups the results seem to be similar. In a recent study from the Democratic Republic Congo, Nielsen et al. (2012: p. 37) found "*[…] that the chronic poor are most reliant on forest income, while the transient poor consume a higher share of harvested forest products. The transient rich have higher agricultural productivity and absolute forest income.*"[168]

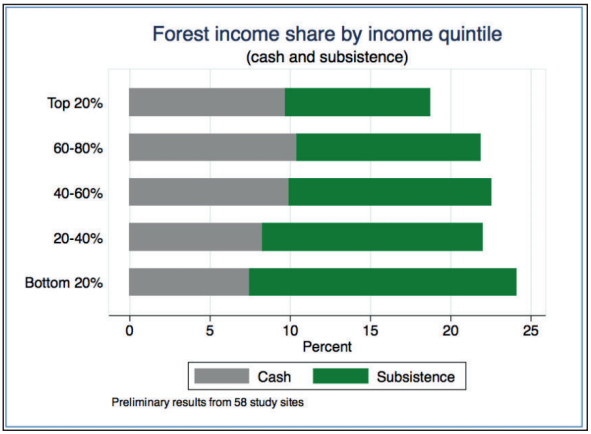
[165] The definition for forest products or forest resources included "*[…]woodlands, wooded savannas, trees on farms and wild plants and animals growing partially wooded terrestrial ecosystems, as well as closed forests*" (Kaimowitz, 2003, p.46).

[166] Few detailed studies exist on the exact share of forest products on rural household incomes. One detailed study in Zimbabwe during the mid-1990s estimated that as much as 35% of household income was derived from forest products with fodder, wild fruits, and fertiliser accounting for the largest part (Cavendish, 2000). Monela et. al. (2001) estimated that for six Tanzanian villages, wild honey, charcoal, fuel wood, and wild fruits accounted for almost 60% of household income. Other studies from Tanzania and South Africa estimated a range of 15–20% of total income (Munishi et al., 2008; Shackleton, Shanley, & Ndoye, 2007).

[167] This contribution is often neglected among researchers on rural livelihoods, as the absence of environmental and forest product income in a review by Ellis and Freeman (2004) illustrates.

[168] In addition to these economic values, many social science researchers underline the importance of forests to indigenous identity. According to animalistic beliefs, spirits live in the forests and the land itself might be closely linked to people's identity.

Figure 3.5 **Contribution of forest products to household livelihoods from 58 country cases, by quintile (PEN research)**



Source: Poverty Environmental Network - (Angelsen et al., 2011) p.12 (Figure 7)

While all of these findings underline the importance of forests for rural livelihoods, there remains a controversy on the relationship. Do people rely on forest products because they are poor, or vice versa. In discussions on agricultural extension both views are implied. Proponents of agricultural extension argue that the poor will eventually have other opportunities to replace their dependency on forest resources, while critics highlight the significant loss of income due to deforestation or lost access to forest.

3.2.4 Business activities within Abobo town

Abobo Town is the economic centre of the *woreda*. It hosts the only weekly market, a hospital, a few restaurants, hotels and several small shops. Most supplies and equipment are only available there.[169] Daily buses commute between Abobo and Gambela Town, and several vehicles transport goods and passengers. Two NGOs have offices in Abobo Town, electricity is available some days of the week through the national grid, and the district level administration maintains various offices there (e.g. Agriculture and Rural Extension, Health and Sanitation, etc.).

I conducted a survey enquiring about the main characteristics of businesses (education of the owner, founding year, profitability, opinions about current change and business climate, etc.). Table 3.3 lists the key characteristics by type of business.[170] Food vendors/small shops were most common (eleven cases), followed by tea and coffee shops, and hotels. Most businesses

[169] Village 17 and Pukedi are the two exceptions with small shops.

[170] See Table 7.26 for further details on the survey (Appendix).

relied on family labour. Some hired personnel, especially among those run by highlanders. The last three columns show the average daily expenses, revenues and net-profits (calculated as residuals). The data in the second column shows that the vast majority of business owners were highlanders. Anyuak only accounted for four out of the 31 cases (ca. 12%), which is in line with observations from visits to the study site.[171] This uneven distribution of ownership across the two ethnic groups stands out, given that in Abobo town their population shares are almost equal.

Table 3.3 Characteristics of small/medium businesses in Abobo Town, Ethiopia (N=31)

	Frequency & Characteristics			Employment (average worker)		Profitability (daily averages)		
Type of business	Totals	Eth. share (Anyuak: Settler)	Av. edu. owner	Total empl.	Total hired	Expenses (US$)	Revenue (US$)	Profit (US$)
Food vendor/ Small shop	11	(1: 9)	Grade 8	2.3	0.1	5.18	20.43	15.24
Tea/coffee shop	9	(1 : 8)	Grade 8	1.7	0.4	4.15	8.78	4.57
Hotel	3	(1 : 2)	Grade 8	4.7	3	9.39	17.26	7.87
Clothing shop	2	(0: 2)	Grade 8	1.5	0.5	6.10	8.11	2.01
Mill grinder	2	(0: 2)	Grade 10	3.5	2.5	3.66	10.98	7.32
Car repair/ garage	1	(1: 0)	Grade 10	15	0	3.35	7.62	4.27
Barber	1	(0: 1)	Above Grade 10	3	2	3.05	4.88	1.83
Local trader	1	(0: 1)	Grade 10	1	0	1.10	2.13	1.10
Restaurant	1	(0 : 1)	No Edu.	4	0	3.35	6.10	2.74

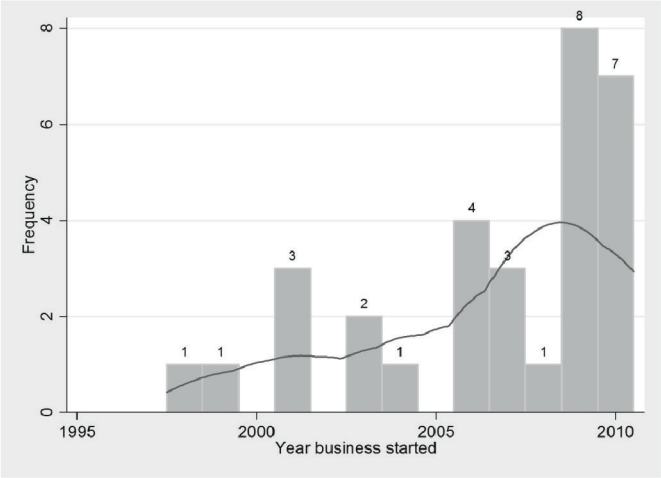
Source: own data (Abobo Business Survey , Feb 2011)

The histogram (Figure 3.6) shows that most of the businesses in Abobo were started in the five years prior to the survey. A few dated back to the 1990s. However, this picture might be misleading, as other businesses may have existed but went bankrupt or quit operating for other reasons. Still the trend seen in the two years prior to the survey suggests a correlation with increased commercial agriculture activity in the area. In addition, many business owners indicated that the LSAI had positive or very positive impacts on their business activities.[172]

[171] From the field data it was not possible to explain the limited entrepreneurship among the indigenous group. When asked during interviews Anyuaks stated that their social ties and linked obligation to re-distribute any profit with the broader kinship worked as a strong disincentive to operate businesses.

[172] For further details on the average daily profitability and employment figures of the businesses surveyed see Appendix (Figure 7.7 and Figure 7.8).

Figure 3.6 The ages of businesses in Abobo Town, Ethiopia (N=31)



Source: own data (Abobo Business Survey, Feb 2011)

3.3 Sample, data sources, and methodology

3.3.1 Sample frame and data collection

To understand local level impacts of LSLAs, local level data is required. I requested available secondary data for Gambela during and prior to the establishment of the investment project. Unfortunately, very few sources for the Abobo *woreda* were available, leaving the need to collect my own data, especially regarding household socio-economic conditions.[173] Fortunately, the investor of Saudi Star Agricultural Development PLC was supportive and permitted me to conduct research at the investment project site. This allowed me to collect relevant data on the evolution and organisational form of the investment project. However, the approval of the investor[174] was only partially sufficient for conducting the required field work.

[173] Potential sources would have been: agricultural survey and health survey data from the CSA—only regional level data; secondary data from IFPRI on rural development in Ethiopia—no data on Gambela available; or secondary sources on the local context from the large international development organisations (World Bank, FAO, etc.)—only very aggregated estimations regarding yields etc.

[174] Conducting applied research in remote rural settings is costly, as transportation costs are comparatively high. The farm management team thus proved very helpful in assisting with transportation and coordination of group interviews with workers etc. Careful attention was paid to not rely on investor support, and to build trust with village representatives and local government representatives.

Table 3.4 lists the data collected during the two field visits.[175] To improve contextual understanding, various semi-structured interviews with available key informants in Addis Ababa, Gambela town, and within the district of the investment project were conducted. Village visits were key to locating the settlements and presenting the research to locals. Significant time investment and thorough explanation of research purposes were required to gain trust in the villages and permission by village elders and local leaders to conduct the household survey.[176] From each village a list of households was obtained to serve as sampling frame.

Table 3.4 Primary data collected during field work on the Saudi Star case study, Ethiopia: 2010–2011

	Data type	Generated through...
Quantitative	Household survey (N=131)	Stratified, random sampling; drawn from all affected communities
	Saudi Star workers survey (N=46)	Stratified, random sampling; strata payment groups
	Business survey (N=31)	Random walk; every third small/medium business in local town
	Village survey (6)	6 Questionnaire on village level characteristics with local leader and 1–2 knowledgeable local residents
Qualitative	Village interviews (one in each settlement)	7 Explorative interviews with 3–6 elderly and local leaders (both men and women)
	Focus group discussions (5)	2 with women (both ethnic groups) 1 with workers (both men and women) 2 local population (mixed)
	Expert interviews	Semi-structured interviews. 32 expert interviews, (10 with staff at investment site at various levels, 11 with local officials on livelihood situation of local population, 6 in Addis on Gambela context, 5 with regional experts in Gambela).

I needed to collect household and village level quantitative and qualitative data in order to address the research objectives. After two visits to the Ethiopian study site in the summer of 2010 and in early 2011, and consultation with local experts and staff of the Ethiopian Economist Association (EEA), six communities (*kebeles)* were selected as the target population based on proximity to the investment project. Each of these communities consists of a number of sub-villages and differs significantly in spatial distribution. For example, Village 17 (the settler

[175] See also related discussion on data generation in Appendix 7.3.

[176] The advantage of this initial investment was twofold: (i) it provided a better understanding of the situation and modification of the questionnaire, and (ii) it provided the opportunity to complete the surveys with household members, since the purpose of the research was well communicated with the communities.

village located near the dam),[177] is divided into two administrative units divided by the main road through the village. The distance from one end of the settlement to the other is relatively confined (ca. 3 km). Some of the indigenous settlements are spread out over a significant area.[178] Using a stratified sampling design, 131 households were selected from the eight nearby villages and the local town. This was approximately 10% of the households living in the area prior to the arrival of Saudi Star.

The setup of the model used in this analysis was based on the contextual information derived from all data sources. The results of the expert interviews, village visits and group discussions were used to justify the selection of two groups and the appropriate mix of activities. The village surveys and household surveys provided sufficient data to quantify the model parameters.[179]

3.3.2 Methodology for early impact scenario: Simulation - Linear Programming

Since the investment is at an early stage of its development I had to predict impacts before they actually occurred (*ex-ante*).[180] Future impacts are difficult to extrapolate, especially if local circumstances such as technology or economic structure are likely to change. One solution for addressing these two challenges was to use an optimisation programme (mathematical programming) based on the cross-sectional data that were collected. Mathematical programming has been used in agricultural economics since the 1950s. Models fulfil two important tasks: (i) they provide a link between economic theory and data, and (ii) allow for practical appreciation of problems and policy orientations (Hazell& Norton 1986, 2ff).

Model description:[181] During the course of one year individual farmers have to continuously make decisions on how to allocate resources according to different production options and seasons. These decisions depend on the physical (land, labour, etc.) and financial (working

[177] During the resettlement scheme in 1984 there were few new settlements. Some of these settlements dispersed, but many still exist. Locals sometimes use alternative names to the original names applied when the settlement were established, but I use the original administrative names.

[178] For example, the former Anyuak kingdom of Pukedi located about 40 km west of Abobo town consists of four sub-village units. Two of these are located in close proximity; while one sub-village is more than three hours walk away. A similar pattern applied to the *kebeles* of Tenji and Perpengo.

[179] For a short description of data generation methods used, see relevant sections in Appendix 7.3 and 8.

[180] See Chapter 2 for further details.

[181] For further information see chapters 2–5 from Hazell & Norton (1986).

capital, assets, credit etc.) constraints.[182] For appropriate specification, any farm-level model requires the following information:

1) *Details of alternative farming activities, their units of measurement, their resource requirements and any specific production constraints*
2) *The fixed resource constraints of the farm*
3) *The forecasted farming activities' net-returns (gross margins)*

In a mathematical formulation this can be described as below:

X_j	= the level of the *j*th farm activity, such as the acreage of rice. Let *n* denote the number of possible activities; then *j*=1 to *n*.
c_j	= the forecasted gross margin of a unit of the jth activity (e.g. value per hectare)
a_{ij}	= the quantity of the *i*th resource (e.g. hectare of land or days of labour) required to produce one unit of the jth activity. Let *m* denote the number of resources: then *i* = 1 to *m*.
b_i	= the amount of the *i*th resource available (e.g. hectares of land or days of labour).

With this notation, the linear programming model can be written as follows:

1.	$\max Z = \sum_{j=1}^{n} cjXj$
Such that	
2.	$\sum_{j=0}^{n} aijXj \leq bi, all\ i = 1\ to\ m$
and	
3.	$Xj \geq 0, all\ j = 1\ to\ n$

The problem is to find a farm plan (defined by a set of activity levels X_j, *j*=1 to *n*) that has the largest possible total gross margin *Z*, but that does not violate any of the fixed resource constraints (2.), or involve any negative activity levels (3.). This problem is known as the *primal linear programming problem*. The mathematical solution of the model assumes certain characteristics. Table 3.5 lists these core assumptions and describes their applicability to the Gambela case study.

[182] Such a prescriptive design is possible if individual farmer makes decisions based on his or her defined objective(s).

Table 3.5 Assumptions of the agricultural model, Ethiopia

General assumptions for *any* LP model*	Reaction regarding *the Gambela* LP Model
• *Optimisation*: it is assumed that an appropriate objective function is either maximised or minimised (e.g. total gross margin Z is maximised)	**Assumed:** local uses maximise returns under given resource constraints, especially until self-sufficiency is met; high poverty levels at initial stage justify '*prof-max*' assumption (P-5)
• *Fixedness*: at least one constraint has a nonzero right hand side coefficient	**Holds**: both groups have endowments (Land, Labour, Capital, etc.)
• *Finiteness*: it is assumed that there are only a finite number of activities and constraints to be considered so that a solution may be sought	**Holds**: realistic to reduce to 5–7 activities to describe their livelihood strategy
• *Determinism*: all c_j, a_{ij}, and b_i coefficients in the model are assumed to be known constants	**Holds**: values derived from survey data or secondary literature
• *Continuity*: it is assumed that resources can be used and activities produced in quantities that are fractional units	**Holds**: coefficients calculated based on units; valuation in monetary terms allows continuity
• *Homogeneity*: it is assumed that all units of the same resource or activity are identical	**Assumed**: my assumption that all HHs of one group react uniformly to the model change (**limitation**)
• *Additivity*: the activities are assumed to be additive in the sense that when two or more are used, their total product is the sum of their individual products; no interaction effects between activities are permitted	**Holds:** since each group's "large farm" is operated as a collection of smallholders farms, no economies of scale are achieved (assumed crs)
• *Proportionality*: the gross margin and resource requirements per unit of activity are assumed to be constant regardless of the level of the activity used; a constant gross margin per unit of activity assumes a perfectly elastic demand curve for the product, and perfectly elastic supplies of any variable inputs that may be used; constant resource requirements per unit of activity are equivalent to a Leontief production function (a linear ray through the origin)	**Holds:** decreasing returns are not assumed; constraints are given(e.g. for off-farm employment) which is limited initially

Source: *Hazel and Norten (1986, p13).

3.3.3 Model specification

To simulate the changes resulting from the advent of Saudi Star, I modelled each of the two local groups operating a single large farm, with all households of each group as members and their cumulative endowments as resources. Both farms followed a mix of income strategies to meet their basic needs and generate income.

The Table 3.6 lists descriptive statistics of household characteristics of both groups. Looking at the first four variables regarding size, age and education characteristics, both groups show similar results. Educational levels averaged between primary (four years) and secondary (eight years). More differences appeared based on comparisons of off-farm employment activities

across both groups. The indigenous group reported higher levels of wage-employment (0.7 members per household compared to 0.51 for settlers), but lower shares of members involved in any self-employment or business activity. There were fewer job applicants at the Saudi investment among the Anyuak. Most households of both groups owned livestock (77% and 78%), but only among the highlanders was there a significant share of cattle ownership. This reflects the significant difference in the value of livestock. Anyuak possessed fewer chicken and goats, while highlanders accumulated cattle if they could afford it.

Farming variables were relatively similar regarding plot and farm sizes, though farm sizes of highlanders were about 10% bigger on average.[183] There was a difference in the distance between plots and homes. Anyuak fields were often located in the forest up to two hours walk from their homesteads. A bigger difference was observed for hired labour during the last main harvest. Anyuak households almost exclusively relied on family labour (only one household reported hiring labour), while settler were more likely to hire workers (30%).[184] The reported number of hours spent on domestic work per week[185] were much higher for settler household heads (9.2 hrs versus 6.3 hrs for Anyuak), which was consistent with observations of higher involvement of settler male heads in domestic tasks (including cooking, cleaning, care, firewood collection, etc.). On average, Anyuak household heads tended to spend many more hours per week on farm work than settlers did (30 hrs versus 21hrs). This huge difference is explained by farming practices (the use of draft animals among highlanders greatly reduced labour inputs) and specialisation within the households (intra-household division of labour).[186]

The last three variables in the table describe the use of natural resources and whether households received food aid over the previous twelve months. Anyuak households collected their own firewood more frequently than settlers (72% versus 45%). Seventeen per cent of the Anyuak households reported hunting (five did not respond –7%). None of the settler households reported hunting. Hunting is forbidden therefore it is likely that responses were affected by concerns about legality.[187]

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[183] Based on survey responses, plots were not measured and numbers are thus likely to be inaccurate, however, they should reflect overall trends and relative shares.

[184] This is still very low when compared to highland Ethiopia where sharecropping and wage employment are more typical.

[185] Here results are only reported for the household heads, thus they are not considered very accurate as most households in the survey had male heads and women were responsible for domestic work.

[186] Exploring this change in division of task at the household level due to new livelihood strategies would be a relevant dimension for further research.

[187] The shares reported very likely under-represent real activity levels. Highlanders are almost exclusively Orthodox Christians, which prohibits eating game meat and thus hunting (including the use of traps) is discouraged. In group discussions in two Anyuak villages it was reported that hunting success had changed significantly due to Saudi Star.

Table 3.6 Descriptive characteristics of households of the two ethnic groups in Gambela, Ethiopia

		Anyuak				Highlander				Difference of Means* (H-A)	
	Variable	Mean	SD	Range	N	Mean	SD	Range	N		Comment
GEN	**HH-size**	5.53	1.79	9	88	5.57	2.15	9	42	0.04	
	AEU per HH	2.99	1.53	9	88	2.69	1.16	5	42	-0.3	Members age 16–59yrs.
	EDU HH head	5.19	4.21	13	77	4.6	3.92	13	40	-0.59	Years of education
	Age of HH-head	40.16	11.01	58	76	38.56	12.9	64	41	-1.6	Years
JOB	**Members wage-employment**	0.7	0.59	2	88	0.51	0.71	2	41	-0.19	Both permanent and occasional employment
	Members self-employment	0.33	0.54	2	86	0.6	0.78	3	40	0.27	# of self-employed members
	Members applied for Job at Saudi Investment	0.43	0.51	1	23	0.72	0.57	2	18	0.29	Submitted application only (not working)
STOCK	**Livestock ownership**	0.77	0.42	1	87	0.76	0.43	1	41	-0.01	0–No; 1–Yes
	Oxen ownership	0.02	0.15	1	88	0.4	0.5	1	42	0.38	0–No; 1–Yes
	Value livestock 2010	864.36	1,606.54	8,500	73	3,967.87	4,726.27	23,605	36	3,103.51	Priced at average local market value (2010)
FARMING	**Farm size (2010) [ha]**	1.78	1.13	5.5	81	1.95	1.79	8	31	0.17	As stated; (accuracy low)
	Plot size (ha)	1.43	0.84	3.58	78	1.46	0.85	3.75	30	0.03	Reported by farmers
	Plot distance from HH (min)	41.48	39.31	180	80	24.58	18.45	71	30	-16.9	
	Hire labour main season	0.04	0.25	2	80	0.3	0.6	2	30	0.26	0–No; 1–Yes
HH	**Hours farm-work head**	6.32	7.94	35	76	9.22	11.47	42	41	2.9	hrs/week
	Hours domestic work of head	29.88	19.83	108	77	21.63	19.36	56	41	-8.25	hrs/week
NAT. RES.	**HH Collect Firewood**	0.72	0.45	1	88	0.45	0.5	1	42	-0.27	0–No; 1–Yes
	HH Hunting**	0.17	0.38	1	83	0	0	0	41	-0.17	Hunting is illegal, thus likely to be underreported in the survey
	Received food aid past year	0.67	0.47	1	87	0.54	0.51	1	39	-0.13	0–No; 1–Yes

Source: own HH-survey, Gambela (January 2011); *Note*: *Differences refer to Settler/Highlander – Indigenous/Anyuak,** see discussion on hunting below.

More Anyuak households reported receiving food aid from either the government programme or the World Food Programme (WFP) during the previous 12 month. Differences in farming practices and technologies used and the subsequent variation of yields were also highlighted during interviews with local experts and village level groups. For the main staple maize reported yields were 5–6 quintals (qt)/ha among Anyuak and 12 qt/ha among highlanders. Yields reported in the survey averaged 5.5 and 7 quintals of maize for Anyuak and highlander farmers, respectively. These low figures might underestimate productivity, as: (i) households begin consuming fresh maize from the stalks before harvest and (ii) losses due to baboons can be substantial. In addition, measurement in the survey was difficult.[188] Under good conditions, up to 18 quintal of maize per hectare are possible, according to an agricultural economist working in Abobo Town. Minor improvements in access to extension services, and inputs (such as improved seeds, pesticides and fertilizer) could further raise yields up to 26 qt/ha (CSA, 2012b).

Thus, despite many household level similarities across both groups (Edu, HH-size, etc.), the differences in technology and practices, wealth, settlement structures, and the degree of market integration distinguished these two groups. In addition, the noted differences in self-organisation and degree of off-farm labour and market integration underline differences in how the two groups can be expected to respond to changes brought by Saudi Star.

To allow for optimisation, the model requires a 'limited and known set of activities.' Based on the focus of the research and the relevance of different livelihood strategies, I grouped the observed aspects used by households to meet their daily needs and generate further income into seven 'activities.'[189] Each group was considered as a single 'composite farm' that engaged in seven activities for which a combination of six resources was required (Table 3.7). The objective of each of these farms was to find the combination of activities that generates maximum gross-revenue.

[188] Size and yield estimates rely on farmers' responses, which are not expected to be completely accurate, especially for plots that were not registered (thus never measured). Triangulation with secondary data and expert statements was used to reach reliable results.

[189] Such grouping poses obvious difficulties, as some categories might be easier to distinguish from others, while others could be further disaggregated. For the purpose of my analysis these seven activities proved useful and sufficient, even though further disaggregation (e.g. of the types of employment) could yield additional insight, however, this would require additional research or assumptions regarding some coefficients. Table 7.10 in the Appendix list details on the sub-sets of each of the seven activities for both groups, including input requirements, weights and gross-revenues.

Table 3.7 Overview of activities and endowments utilised in the LP model for households from the two ethnic groups in Gambela, Ethiopia

	Abr.	Description	Unit (input/output)	Time (for product.)
Activities	**AGR1**	Agriculture (manual), mainly maize and sorghum	1 ha	1 year
	AGR2	Agriculture (Ox), mainly maize and sorghum	1 ha	1 year
	LC	Land clearing (forest conversion to farmland)	1 ha	1 month
	HN	Hunting for game meat	1 mammal (ca. 25kg meat)	1 activity (4–5 days)
	GATH	Gathering of wild fruits, roots and fuel wood	1 package/bundle (~ HH's meal)	1 activity (1–4 days)
	SELF	Self-employment and small business	1 monthly return	1 month
	OFFJOB	Wage employment and daily labour	1 monthly salary	1 month
Endowment	**A-LAND**	Agricultural land	Ha	
	O-LAND	Open access land	Ha	
	P-Labour	Labour during peak season (3 months)	AEU working days	
	O-Labour	Labour during off-season (9 months)	AEU working days	
	Oxen	Oxen used for ploughing	Ploughing days	
	Capital	Capital (cash income and assets owned)	Birr	

Note: For the detailed table on the activities, their input requirements and respective requirements, see Table 7.10 in the Appendix.

Based on contextual information seven groups of activities were defined:

- **Manual planting with hand tools (AGR1):** Both groups used hoes (settler) and digging sticks/*Chala* (indigenous) to plant some of their crops. Among the settlers the poorer households that did not own oxen relied on manual planting. There was only one indigenous community that reported ownership of a few oxen. More than 95% of the indigenous plots were cultivated using manual techniques only. Crops cultivated were mainly maize and some sorghum (accounting together for more than 88% of plots).[190] I focused on these two mayor staples.

  Agriculture activities are highly seasonal according to the annual precipitation pattern. During April and May there was peak demand for domestic labour to first clear and then prepare the fields. Weeding is also important, requiring a considerable amount of additional labour during July/August (depending on the date of sowing). Thus, I estimated that the peak season included three months of the year.

- **Ploughing using draft animals (AGR2):** The settler use the same agricultural practices used in highland Ethiopia. They plough their fields with oxen, reducing labour inputs and generating higher yields and better results if fertiliser is applied (McCann, 1995). Ploughing with oxen is also highly seasonal. Preparation of the fields must happen close to

[190] Maize accounted for 97% of the first plots of each household, indicating its importance. Most households cultivated sorghum (more drought resistant) on smaller second plots, but only wealthier households cultivated three or more plots that included additional crops such as sesame or rice.

the onset of the rains, as late sowing will drastically reduce yields. Using a yoke of oxen farmers can plough 0.25 ha per day. In the model I assumed that the key time for ploughing is during the first 25 days before the start of the rainy season. A few households rented oxen. Costs to plough a 1 ha plot ranged 600–800 Birr (US$ 36.60-48.8). Yields for plots using draft animals were much higher (e.g. 18qt/ha of maize compared to 7qt/ha using manual planting practices).

- **Land clearing (LC):** If land was required for agricultural production, both groups had the option of converting forest to agricultural land. This was done by the indigenous group every 3–7 years when plot fertility declined.[191]
- **Hunting (HN):** The indigenous group reported hunting year round, though there was a seasonal aspect to this activity due to variable abundance for different migratory mammals (e.g. the white ear kob).[192] Hunting is performed in groups of 4–10 people and normally took place for several days. In addition to hunting parties, snares were used to catch smaller mammals near the homestays.[193]
- **Gathering of forest products (GATH):** Open access land was used by both groups for firewood and timber collection. While mainly done to satisfy domestic demand for fuel, some products were sold, especially to wealthier settler households that reported purchasing fuel-wood or charcoal. The indigenous group also collected a large variety of wild fruits and roots from the forest. The gathering of fruits and roots mainly occurred in the early months of the year when harvest stocks were depleted (more activity in the off-season). In addition to these gathering activities both communities engaged in fishing for subsistence purposes as well as for sale on the local market (sun-dried).[194]
- **Self-employment and on-farm business activities (SELF):** Both groups engaged in a number of business activities to generate additional income. In particular, the indigenous group required cash income to purchase salt, coffee and sugar. The single most important business activity was brewing maize-based beer (*borde*), which was mainly performed by women. The beer was sold to neighbours and community members, and used as in-kind payment for collective work (e.g. clearing forest for agriculture). The importance of brewing was often highlighted, especially by the women, during village visits and group interviews.

  The settlers also reported brewing beer. In addition there were a number of small shops in the two settler communities. As frequently seen throughout Ethiopia, tea shops serving

[191] Out of the 158 plots, 104 plots were established by the households themselves through conversion of forest. The remaining share was mainly inherited or allocated through village leaders (see Table 3.2 above).

[192] The mainly orthodox settlers do not eat game meat and therefore do not hunt. Though prohibited to own firearms by law, a few households reported the possession of arms used for hunting.

[193] Wildlife populations in Gambela are significant. The region hosts one of the largest mammal migrations in East Africa. Wildlife spotting efforts by the Ethiopian Wildlife Conservation Authority and team of experts reported core wildlife areas, some of which are threatened by on-going large-scale investments (see Appendix 7.3 for details on Gambela's forest and wildlife).

[194] Fishing does not explicitly require open-access land—indeed some occurred at the irrigation dam—and it therefore might lead to an underestimation of the land requirement of the 'gathering' activity, especially among the indigenous group where fish is an important part of the diet and fishing with spears is common after field work and by children after school.

sweet black tea (*chai*) or coffee (*buna*) were found in both communities. In Abobo town, there were two larger hotels, a barber shop, a mechanic, and other small businesses.[195] In both communities, table-soccer and billiard tables are rented out by wealthier households to generate additional income. Recently, construction and renting of houses has become an important income source.[196]

- **Off-farm employment and casual paid labour (OFFJOB):** As indicated in Table 3.6 households from both groups often had members working for daily or monthly wages. Jobs were mainly concentrated in: (i) the small business sector of Abobo Town and (ii) the local Ethiopian-owned commercial farms that occasionally hired additional workers. In Abobo Town jobs were mainly in public administration (*woreda*-level government), the hospital, two small NGOs, several shops, and restaurants. Prior to the arrival of Saudi Star investment, jobs outside of Abobo existed at an old state farm (only applicable to a small share of the survey sample because the farm was located at the other end of study area), and at 3–4 Ethiopian-owned commercial farms (30–100 ha) that cultivated cotton and maize. While these seasonal jobs contributed income, jobs were characterised as "hard work," "bad conditions," and "too little pay" in two group interviews.

Each of the activities described above consumes a set of inputs. These endowments were listed in Table 3.7(above) and are described as follows:

- **Agricultural land (ALand)** describes land used by households for crop cultivation and was measured in hectares.
- **Open access land (OLand):** Communal land used for collection of firewood, timber, wild fruits and roots, and hunting. Hunting and gathering were not competitive activities. Open access land was measured in hectares.
- **Labour (family labour):** Both groups relied largely on family labour for cultivation (Proposition-1). I assumed no labour mobility across groups. Labour was measured in working days by *Adult Equivalent Units (AEU)*, (i.e. household members age 16–59).
- **Oxen:** Draft animals were important for the AGR2 activity, as their use increased productivity of labour and land, and increased yields and revenues. Unfortunately the climate and prevalence of sleeping sickness in Gambela make livestock husbandry difficult, explaining low rates of cattle ownership among the local population. Oxen as an input are measured in ploughing days per yoke of oxen.
- **Capital:** Many of the activities required capital input, either in the form of equipment or cash to purchase inputs. Capital was measured in Birr at 2011 (Jan) exchange rate. For later calculation of purchasing power parity World Pen Tables the ppp-coefficient was used.[197]

[195] See the discussion on business activities in the area (section 3.2).

[196] Migratory workers were often denied ownership of land in these new communities (or were not interested), and therefore relied on rented housing. Poor migrants seeking employment at Saudi Star also lacked the necessary capital to build their own homes.

[197] At the time 16.4 Birr = 1 US$ and ppp-coefficient was 5.22.

Constraints for the given sets of activities can be expressed through a limiting factor of production (endowment) on the right hand side (RHS) of the equation. Additionally, there can exist constraints in the form of upper or lower restrictive bounds for activities (Hazell & Norton, 1986). In my model there were the following four constraints assumed to be critical for production decisions of each of the farms:

- **Peak-labour constraint:** Agriculture production was highly seasonal. Labour was needed mainly for land preparation, weeding and harvesting. These tasks are needed during peak seasons. I assumed this peak accounted for three months of the year. While it is possible to work harder, one AEU cannot work more than one day, thus the labour supply was limited during this peak season to 25% of the total annual labour supply. The remaining 75% accounted for the off-season labour supply. Labour will be denoted as Lp (labour in peak season) and Lop (labour during off-season), respectively.
- **Oxen constraint (AGR2):** The availability of draft animals limits the amount of land ploughed and thus the area under cultivation. Ploughing must be done at the onset of the rainy season to allow optimal crop germination and growth. A yoke of oxen takes four days to plough a hectare of agricultural land (ALand). I assumed this preparation must be done within a 25-day period around the onset of the rainy season. Therefore the limiting factor for AGR2 was the available ploughing days, derived from the number of oxen available within each group.
- **Market constraint (small RNFE):** Both groups engaged in several means of self-employment or small-scale business activities selling products or services in the local market. However, the small RNFE has a limited demand for self-producers.
- **Limited off farm employment:** For agricultural production households rely mainly on family labour. Few businesses in Abobo Town and some Ethiopian owned commercial agricultural projects demand labour. In addition, the government employs a number of civil servants, which are not necessarily from the area itself. Thus, there is not a functioning labour market (yet) and demand for labour remains relatively low.

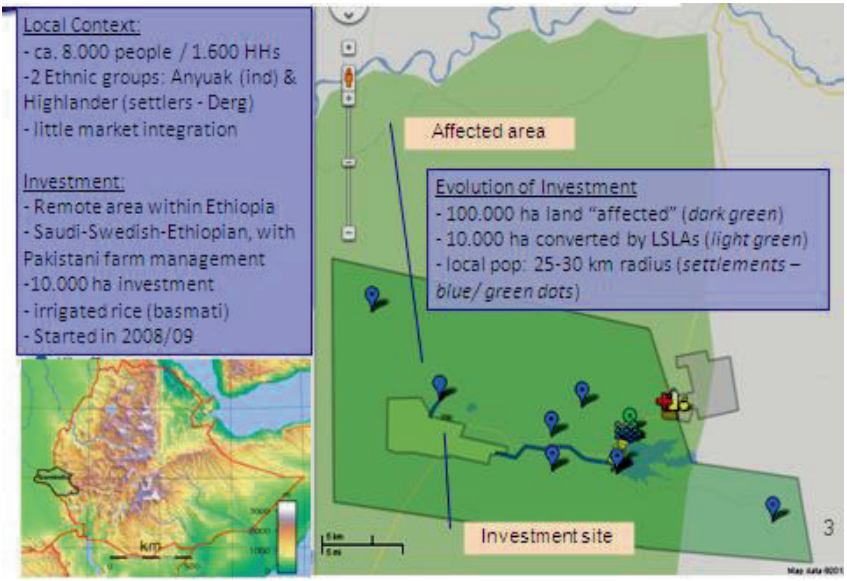
3.3.4 Parameterisation of the Model

After the model has been conceptualised and the set of activities and endowments was defined, they needed to be parameterised. Endowments of both groups were derived using mean values from the household survey. The key variables are presented in Table 3.8. Since precise demographic data on the composition of the two ethnic groups in the Abobo *woreda* was not available, expert consultations and field visits were used to derive proportions of both groups. Accordingly a composition of 70% Anyuak to 30% highlander was assumed for the sampling frame and the model. The total population was assumed to be 1,600 households, which roughly

sums up to a population of 8,000–9,000 people, or about half the population of Abobo *woreda* (Census Commission, 2008).[198]

The area considered 'affected' has the size of 100,000 ha. Some of this land has been converted into private land (ALand), the rest remaining open land (OLand). The amount of initial ALand was calculated based on average farm sizes of both groups.

Figure 3.7 Stylised map of investment project location, local settlements, and key characteristics used in the LP model, Gambela



Source: own graph, based on maps from Google (2013)

Total annual labour supply was calculated from average AEU per HH multiplied by working days per year. Initial levels of capital were a combination of assets and livestock owned, priced at current values stated in the survey. The number oxen owned by the respective groups were the average per household in the survey multiplied by the total number of households in the model.

[198] Since Abobo town is part of the population affected by the investment, ca. 25% of the population lives in semi-urban setting (28 out of 131 HHs in the survey). Without these households the population density was about 6–7/km^2 (Figure 3.4).

Table 3.8 Total values of key endowments for both ethnic groups used in the LP model in Gambela, Ethiopia

	Indigenous	Settler	Total	Comment
# of HHs	1,040 (70%)	560 (30%)	1,600 (100%)	As in sampling frame.
Private land (ha)	1,872	1,120	2,992	Based on average land/HH.
Communal Land (ha)	67,906	29,102	97,008	As residual from total area (Ind. 70%; Settler 30%).
Labour (days/year)	898,560	435,456	1,334,016	Based on average.
Capital (Birr) **(US$ equivalent)**	2,676,648 (163,210)	4,212,376 (256,852)	6,889,024 (420,062)	In ppp the total would translate to 2.2 mio US$
Oxen	0	168	168	Based on average.
TOTAL area ([ha)			100,000	Open land + agric. land. (Simulation: 10K ->Inv).

Source: Derived from HH Survey results (January 2011)

For each livelihood activity, values were derived using a four-step analysis. (i) First, reported livelihood activities or 'sub-activities' of both groups were grouped into the seven clusters of *activities* (AGR1, AGR2, LC, HN, GATH, SELF, and JOB). For example, operating a small tea-shop and sales of home-brewed beer were grouped as SELF activities. (ii) Second, to derive the matrix of input-output relationships, resource requirements for each sub-activity were derived.[199] Labour input requirements were based on the amount of time reported in the survey for different tasks (AGR1, AGR2, GATH, JOB) and village members interviews (HN, SELF). *Open land* (Oland) requirements were based on literature and estimations. For HN I assumed that an area of 100 ha (1km^2) was needed to locate and take prey and that a typical mid-sized mammalian prey would provide ca. 25kg game meat, valued at the market prices for a similar quality of meat (US$ 3.40 or 55 Birr/kg at the time of the survey) plus a transportation/access cost (5 Birr/ 30 cent).[200] For gathering forest products smaller areas were assumed to be sufficient to find the equivalent of a daily meal from roots/fruits or a bundle of timber/fuel wood (5 ha and 10 ha respectively). In general, *Labour inputs* had to be divided between peak and off-season labour requirements to reflect seasonality of activities. For the agricultural activities (AGR1, AGR2) more weight was put on the peak season. While the normal ration would be 1:3 (i.e. 25% to 75%) of the annual labour supply, for agriculture activities a ratio of 2:3 was chosen. In the cases of hunting and gathering it was the opposite, as they are mainly performed during off-season I chose a ratio of 1:4. Land clearing is only performed before the growing season (ratio 0:5). Other

[199] While deriving this from the survey results was straightforward in some cases (e.g. cost for brewing beer, or land requirements for maize cultivation), for other parts it was more difficult to define precise input requirements.

[200] This estimation is rather conservative, as sometimes larger game mammals yield 50kg or more.

activities are supposedly performed year round at equal intensity (ratio 1:3). *Capital* requirements were based on costs for inputs or equipment (including hiring labour). In case of the wage-employment categories (JOB), transportation costs accounted for most of the capital required. (iii) Third, returns were priced in monetary terms to allow comparison across activities and hence optimisation.[201] For agricultural production the local market price was multiplied by yield estimates. As most households were net-consumers of environmental services, pricing was established using normal prices for a bundle of firewood, sack of charcoal, etc. at the local market and a lump sum for transportation costs was added. For wild fruits and roots, a day's meal equivalent amount was used and priced at local market prices for similar vegetables/staples. The same applied for pricing of yields per ALand hectare: quintals of maize/sorghum were priced at local market prices and added as a lump sum for transportation costs per quintal (net-consumer). Transportation costs differed for both groups due to better road access in highlander settlements. (iv) Finally, the *weights* for each of the sub-activities were applied. Weights reflected the importance of the activity and the frequency reported in the survey and interview results. For each group of activities the weighted sum of sub-activities amounted to 1. For example, the manual agriculture of highlanders consists of the two sub-activities; manual sorghum cultivation and manual maize cultivation. Each activity was weighted based on the respective percentages of total plots in the survey, with 0.125 and 0.875 respectively. The background table for the set of sub-activities describing all four steps can be found in the Appendix (Table 7.10).

Following the parameterisation of the activities, the constraints were quantified as follows.

Peak labour constraint: Given the seasonality of some activities and the lack of a local landless class, I delineated the peak demand corresponding to land preparation, planting, and weeding over a three-month period, which seems appropriate since farmers have a certain degree of flexibility for performing these activities and can work extra hours, although timing is often determined by weather and climate conditions (see also Hazell & Norton, 1986, p.44f). The peak labour constraint was thus derived as 25% of the total annual labour force from the total labour supply, leaving the other 75% for the off-season tasks.

Ox constraint: Ploughing must take place close to the onset of the rainy season to allow for a good seed bed and right levels of moisture. Early ploughing would increase erosion; late ploughing will not allow optimal germination of seeds and reduce yields. Thus, I defined a window of 25 working days (four weeks) around the onset of the rainy season as the limit. To

[201] This is required to satisfy the model assumptions:(5) continuity,(6) homogeneity, and (7) additivity (see Table 3.5).

properly prepare a seed bed a yoke of oxen needs four ploughing days (Aune, Bussa, Asfaw, & Ayele, 2001; McCann, 1995).

Market constraint: The area of Abobo is barely integrated into regional or national markets. Villagers mainly rely on stable local demand (absence of market for outputs and no trade—Proposition-4). Lacking precise expenditure data, I relied on secondary data at the national level. Recent analysis by Tafere et al. (2010) explored the elasticity of households demand in Ethiopia using recent country-wide data (from CSA 2004–2005). They reported expenditure shares per staples and other food and non-food items.[202] For the purpose of the model the total capital stock available can be used as the potential maximum expenditure and thus to calculate the upper bound (market constraint) by taking 42% of this maximum expenditure for both groups. The levels of SELF reached were 1,256.54 for Anyuak and 1,864.25 for Settlers (*upper bound SELF*).

Labour market constraint: As described above and consistent with Binswanger and McIntire (1987), the study context was characterized by a very limited labour market. There was little opportunity for off-farm employment apart from the few daily labour jobs offered by the medium-scale Ethiopian owned commercial farms in the area, the hospital, local NGOs, and the *woreda* administration. The initial limit was derived by estimating the amount of jobs that each of these institutions offered, and to what degree they were occupied by locals. For example, many of the civil servants working in the Abobo government offices were from other parts of the region (Table 7.9 in the Appendix lists the respective number of jobs). The initial maximum number of monthly jobs per group were 1,228 for indigenous and 818 for settlers (*upper bound JOB*).

3.3.5 Calibration of model parameters and sensitivity testing

After the values had been derived, results of the base run were compared with the observed data and survey outcomes. The reported number of days invested in agricultural activities might represent the peak working weeks accurately, but overestimated average monthly working time in the fields. I thus reduced these figures, which did not significantly change the different activity shares, but increased the amount of land cultivated, which had been very low. Hunting activities, while remaining a significant contribution to household diets and a substitute for purchasing meat from the local market, was initially too profitable. I reduced the assumed amount of meat provided per mammalian prey from 35 kg to 25 kg. Larger antelopes, like the frequently hunted

[202] Regarding the importance of location in their analysis Tafere et al. (2010) distinguished between urban and rural areas. For our purposes I took the average expenditures on key resources for rural areas as an approximation of how much each group required for services and goods produced by the activities grouped under SELF. If it is assumed that these activities account mainly for services (haircuts, meals, repairs, etc.) and expenditure on non-food items (including clothing, shoes, etc.), it accounts for ca. 42% of expenditures. I did not have precise expenditure data for the study area.

white ear kob can yield up to 60 kg of meat. However, smaller pigs (*Kul*) or warthogs are also commonly hunted, justifying an average value of 25 kg.[203]

Similarly, labour input for beer brewing was slightly increased after the initial test. It seemed that women understated the amount of time invested in preparing the malt brew and required for continuous supervision of the containers during fermentation, etc. In addition, I cut the returns from forest products slightly. The initially used market prices might have been only achievable with good road access, and thus I reduced the values by 10%.

Once the matrix of coefficients had been defined the sensitivity of the model was tested. For each of the core parameters the model's behaviour was analysed if the initial value changed by one standard deviation (+ s.d. | –s.d.). The respective results are displayed in Table 7.12 in the Appendix. The models' behaviour and observed changes in output levels and shadow prices were in line with the assumptions and economic theory. Thereafter the model, with limitations, was found to be robust and the simulation of scenarios performed.

3.4 Results: Income level changes due to re-allocation of land and RNFE growth

The base run of the model revealed: (i) the *composition* of each farm's total gross return and (ii) the *level* of the total gross return (Table 3.9). The indigenous group had a balanced mix of income strategies to meet its annual income and nutritional needs. Agriculture (AGR1) accounted for 22.3%, gathering and hunting together accounted for more than 40% and business activities formed another 18.5%. Wage employment only contributed 13.3% of annual income. Farming (AGR1 + AGR2) was the major livelihood source for the highlander group, accounting for 43% of total gross revenue. Business activities were second with a 37.5% share, gathering forest products contributed 7%, and wage employment 12.1%. The indigenous and settler group annual gross returns were ca. 6.1 million Birr and ca. 4.7 million Birr, respectively. In US$ this translates to US$ 372,681 and US$ 289,109 (real), or US$ 1.95 million and US$ 1.5 million in ppp, for the indigenous and settler group. In purchasing power parity US$ (Jan 2011 exchange rate) this translated into average annual farm household income of 1,871 and 2,695 for the indigenous and settler groups, respectively. In daily per-capita income terms, this meant 0.93 and 1.32 US$ (in ppp term; or 18 and 25 cents in nominal terms) on average for the respective groups.

[203] Additional details on wildlife resources in Appendix 7.3 (especially Table 7.16 and Table 7.17).

Table 3.9 Composition and total gross returns for indigenous and settler groups from the base run of the Ethiopia model

Group	**Composition** of total gross returns *Activity share of total gross-return (in percentage)*							**Level** of gross returns *Absolute returns& per HH/capita*		
	AGR1	*AGR2*	*LC*	*HN*	*GATH*	*SELF*	*JOB*	TOTAL Gross-Rev. (US$ real)	US$ (ppp)/ HH/yr	US$ (ppp)/ cap/day
Anyuak	22.3	0.0	0.0	16.7	29.3	18.5	13.3	372,681	1,871	0.93
Settler	1.6	41.8	0.0	0.0	7.0%	37.5	12.1	289,109	2,695	1.32

Note: Base scenario; %-shares of total gross income per group/large farm

3.4.1 Scenario 1—Impacts of lost forest access for both local ethnic groups

I assumed that after the establishment of the LSAI, that access to land would have changed, and simulated the impacts on the income levels of both groups. As the investment project increased in size, local users lost access to forest resources. Thus, the indigenous group lost a considerably higher share of income (4.4%) compared to the settler group (0.6%). More details are discussed below in the comparison of all scenarios.

3.4.2 Scenario 2—Impacts of large-scale commercial investment

The establishment of the investment project not only caused a loss of access to forest, but also created a growing demand for manual and skilled labour. This demand was only partly met by local supply, given the aforementioned absence of a landless worker class (P-1) and the lack of required skills (skill gap). Managers of Saudi Star complained that reliable and skilled workers were rare. In February 2011 the Saudi Star investment already employed more than 750 people (company data), out of which only a small share came from the surrounding villages. Approximately 20% were local workers from the Anyuak group. The share of local highlanders among the workers was not clear, since many migrant workers had already settled near the investment, working as semi-skilled and un-skilled workers on the LSAI.

The LSAI will be operated in 200ha units (blocks). Each will be operated by a block manager, a number of foremen, several tractor drivers, transplanters, and technical staff. Depending on the capital intensity there will be a trade-off between more technical staff and tractor drivers vs. more manual labour (e.g. for transplanting seedlings). I assumed the low-labour intensity option (for rice production) of 0.2 jobs created per hectare (i.e. 40 per block).[204] This added up to a total of 2,400 monthly jobs per year created for every 1,000 ha under operation. These jobs are expected to be filled primarily by migratory workers (2/3) and to a smaller share by local labour (1/3). Additionally, consistent with field observations and company data, I presumed that a

[204] During the field visit in 2013 I confirmed that Saudi Star opted for the more capital intensive option.

slightly disproportional share of jobs among the two groups, with Anyuak accounting for 60% and highlanders for 40%.

Demand for locally produced non-food items, services and beverages (e.g. local beer) are expected to increase as workers spend income locally. Assuming that a 10% share of the monthly salary will be spent on these local products, there would be an increase of slightly above 5% in demand for local SELF produce. In absolute terms, a significant increase of income was observed. Notably indigenous group incomes rose above the official poverty line (US$1.25 /day) to US$1.43/day once the investment is operational at 10,000 ha. The per capita income of highlanders increased from US$1.32/day to US$2.08/day. This equates to increases of 52.4% and 57.8% for the indigenous and settler group incomes, respectively. The evolution of LSAI affected the composition and thus relative shares of livelihood strategies for both groups. Table 3.10 lists the relative contribution of each activity before the investment project started (*Base*) and again once it is fully operational at 10,000 ha (*Full operation*), for both groups. The relative changes (i.e. the final share as a percentage of the initial share) are also presented.

Table 3.10 Changes in composition and income levels between the base scenario and full investment project operation for both ethnic groups in Gambela, Ethiopia

		Livelihood activities (percentage of total group income generated by)						Total income of full group	
Group	Status	*AGR1*	*AGR2*	*HN*	*GATH*	*SELF*	*JOB*	Total (Mill. Birr)	Total (%-Change)
Ind	Base	22.3%		16.7%	29.3%	18.5%	13.3%	6.1	100.0%
	Full size	12.4%		9.8%	17.2%	18.1%	42.5%	9.4	153.3%
	*Change**	*-44%*		*-41%*	*-41%*	*-2.1%*	*+220%*	-	-
Set	Base	1.6%	41.8%		7.0%	37.5%	12.1%	4.7	100.0%
	Full size	0.0%	22.7%		4.0%	35.7%	37.6%	7.5	157.8%
	*Change**	*-100%*	*-46%*		*-43%*	*-4.9%*	*+211%*	-	-

Note: AGR1—manual agriculture, AGR2—agriculture using draft animals, HN—hunting, GATH—gathering forest products, SELF—self-employment and SME, JOB—off-farm employment/wage-employment.
* *Change* = (End/Base)-100%; shows the *relative* change of an activity's importance with respect to group livelihoods.

Agriculture lost significance for both groups, with absolute decreases of 10% and 20% for indigenous and settler groups, respectively, and relative decreases as share of overall income of almost 50% for both groups. This indicates a shift of priorities among livelihood strategies. It also implies that less land is cultivated by the local population (i.e. more land will become available), and thus a potential drop in land values. This change would likely reduce local food supply. Gathering and hunting would decline strongly in relative importance for the indigenous group (dropping from over 45% of total income to below 30%). However, they would still contribute a large part of indigenous group's income (ca. 27%). Self-employment activities

remained at similar shares. These relative figures mask a considerable increase in absolute terms, as overall income increased by over 50% for both groups. Lastly, wage-employment increased considerably in its importance and contribution to total income (increases above 200% for both groups).

3.4.3 Scenario 3—Production shock of the large-scale investment project

Saudi Star, as natural to any agricultural enterprise, is subject to various risks. These can take the form of crop price fluctuations or stress of the mother company's financial status (MIDROC Ethiopia) etc. Hence, production was cut by 50%, causing a reduction of the workforce and money spent on local produces (production shock).[205] Under these conditions, per capita income would drop by 18.9% and 17.3% for members of the indigenous and settler groups respectively (Figure 7.10 in the Appendix).

The local population would attempt to compensate the shock by shifting back to gathering and hunting activities and increased household agricultural production. However, agriculture requires long time horizon planning, and could thus only partly serve as a substitute for the decline in employment. Hunting and gathering activities require access to open land, which would be partly restricted due to Saudi Star's expansion. Therefore, such a production shock would deteriorate local livelihoods (see Figure 3.9 below for details on shifts).

3.4.4 Scenario 4—Unequal division of employment opportunities

Developments in Gambela since spring 2012 indicate another trend for the investment project. From the onset of the government's efforts to lease out land, the indigenous groups feared marginalisation and the loss of access to 'their ancient' lands. The culmination of discontent with the Saudi Star's activities in the region erupted in the violent outbreak between some Anyuak of unclear origin, and security forces of the Saudi Star investment. On April 28, 2012, two Pakistanis and three Ethiopians died in a shooting at the construction site.[206] All victims were working for the largest sub-contractor, which subsequently asked most Anyuak employees to leave the premises. Afterwards, Saudi Star only hired members of the Anyuak ethnic group with good references, and has tried to fill positions with either local highlander or migrant workers

[205] In the model this implies that while all land had been converted from forest to farmland, only 50% is operational and thus the demand for JOB and SELF activities decreased accordingly.

[206] Directly after the shooting, very diverse figures regarding the number of people injured and killed circulated. Some media sources reported figures as high as six Pakistanis and four Ethiopian's killed with an additional ten victims injured (Ethiopiamedia, 2012). It was also claimed that at least one Anyuak member of the security force was killed, indicating that the clash should not be reduced to simple ethnic divisions according to the long history of the narrative on the region. Government media even reported that 10,000 residents gathered in the regional capital to condemn the killings (Walta, 2012).

(based on conversations with farm managers in May 2013).[207] Therefore I ran a simulation where only 40% of the jobs are filled by Anyuaks, and the highlanders account for 60% of the jobs.[208] In consequence, per capita income of the indigenous group would increase from US$ 0.93 to US$ 1.24/capita (+33%), while settler per capita income would rise from US$ 1.32 to US$ 2.39 (+81%). Thus, the gap in per capita terms would almost triple in absolute terms and more than double in relative terms. However, the difference would not only be reflected in per capita income, but also in the composition of livelihood strategies. Such a high share of the job opportunities dominated by the highlander group would cause a shift of a considerable share of their population out of agriculture, resulting in an important structural change in local livelihoods. For the Anyuak, on the other side, agricultural and gathering activities would remain very important, making them more dependent on natural resources. Under such a scenario, it becomes obvious that the indigenous group would participate far less than the settler group, leading to a sharp increase in horizontal inequality (i.e. inequality between the two groups, see Stewart (2001)).

3.4.5 Scenario 5—Investment paired with inclusive rural development plan

A more positive scenario would be that the government, donor supported development programmes, and/or the investor would make an effort to improve smallholders' productivity and market access. At the moment yields are very low, ranging around 7–9 qt/ha with manual planting and 16–18qt/ha using draft animals. In a similar agro-ecological context, yields of up to 26qt/ha can be reached (i.e. an increase of 40%–75%) (CSA, 2012b). Application of modern inputs is very low in Abobo. For example only 10 % to 20% of cereal crops were fertilised with chemical fertilisers during the 2002 Meher season, and only 6% to 12% of the plots planted used improved varieties (Tadesse et al., 2006).

In the following scenario a 'smaller' investment (5,000 ha) was paired with a public investment in higher yield varieties, extension services, and infrastructure (reducing isolation). In addition, greater availability of draft animals or tractor rentals would be made available (either through public or private investment). In quantitative terms, I assumed a yield increase of 50% for

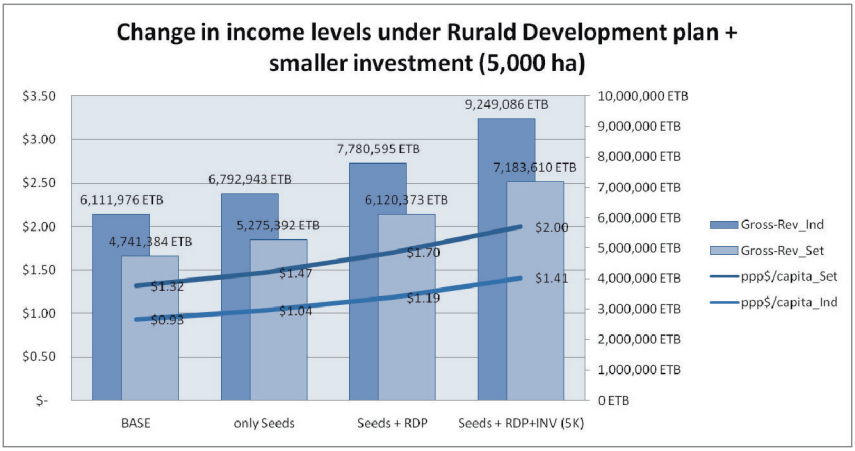
[207] While the farm management stated in an interview reaction to the violence, that they planned to overcome resistance by locals through offering additional jobs and training (Davison, 2012), a field visit in May 2013 indicated a different development. Trust had eroded and Anyuaks—even though many condemned the violence—felt mistreated (based on response to a group interview, May 17, 2013). This shooting was followed an ambush on a bus in March 2012 that killed 19 people, some of which were Saudi Star workers, but an official link to the investment project was not confirmed in that event (BBC, 2012).

[208] It could be argued that the overall amount of jobs available for locals has been reduced since the violence, but I assume similar numbers. I did, however, change the relative shares of participation (from 40:60 to 60:40 for Highlander and Anyuak).

manual agriculture (AGR1) and 25% for the use of draft animals (AGR2), plus a public investment equivalent to 40 new oxen in the area. Through the development of infrastructure, the demand for self-employment increased by 15% and the introduction of new technology implies a change in the labour market (relaxing P-4), which is consistent with Binswanger and McIntire (1987). As discussed in the literature, small-scale production is more labour intensive, and the assumed push for more commercialised agriculture requires local businesses, traders, etc. (Ellis & Freeman, 2004; Haggblade et al., 2010). For this scenario an additional 165 off-farm jobs per month were assumed.[209]

The poverty impact of such an inclusive rural development policy (RDP) can be seen by step-wise introduction of the improved varieties or measures to boost yields, then additional draft animals or tractor services, improvements in market connections and infrastructure, and finally add an investment project of 'only' 5,000 ha (Figure 3.8).

Figure 3.8 **Potential impacts of an inclusive rural development policy, paired with a smaller investment project in Gambela, Ethiopia**



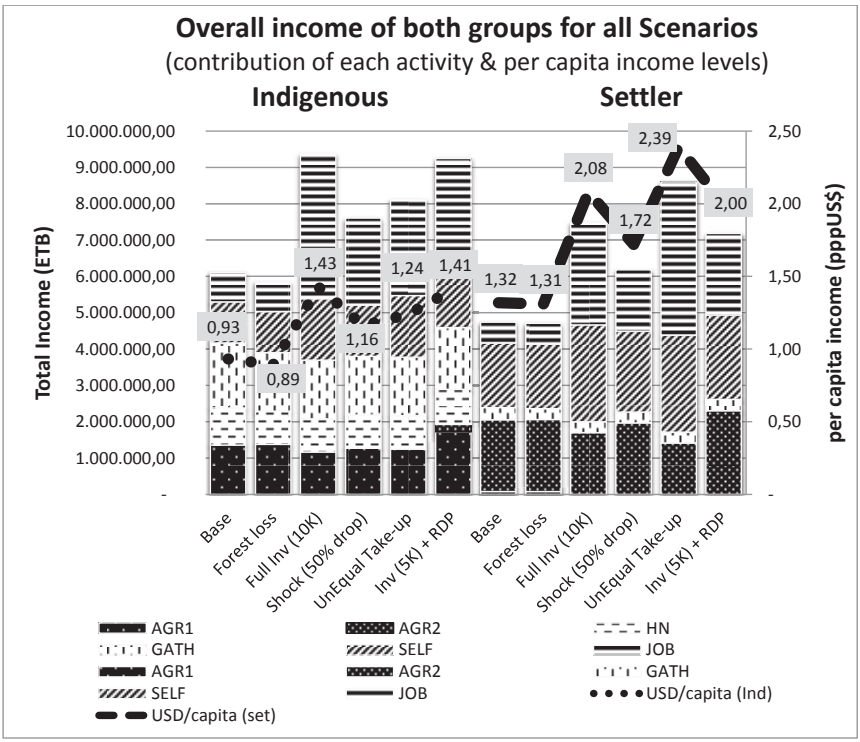
3.4.6 Comparison of all scenarios

Having examined these different scenarios it is interesting to compare total revenues (income level) of each scenario and the respective shares of the different livelihood activities (composition of income), for both groups.

[209] This is justified by increased labour movement across households once productivity gains release labour and make additional income available to hire workers or invest in SME activities. For the 1,600 households in the model, this number indicates that every tenth household would start hiring a worker each month.

Figure 3.9 shows the change in daily per-capita income (in ppp US$) as well as both groups overall total revenue and the respective composition. Based on the average per capita income of both groups (dotted lines), would the loss of forest caused overall income losses for both groups? The emergence of a LSAI, brought about new employment opportunities and increasing demand for self-producers and local services, and increased incomes by more than 50%. Such growth, however, is prone to shocks as the results for scenario four have shown: If the investment was assumed to shrink by 50% and thus had to lay-off workers and reduce production, local income shrank by almost 20%, pushing the indigenous group—on average—below the poverty line. In the next scenario, the access to jobs created was biased toward the highlander group. This scenario was motivated by observations at Saud Star following the violent clash in spring 2012. Such unequal division of jobs yielded significant inequality in the results. The beneficiary would be the highlander group, which reached an average daily per capita income of US$2.39 (ppp), while the indigenous group was at US$1.24 (ppp) per capita/day.

Figure 3.9 Comparison of the composition and income levels across all five model scenarios



Thus the highlander group, which was relatively better off before the establishment of the investment activities in the area, would be twice as wealthy (measured in income). The relative income gap between the two groups grew from around 41–48% in the other scenarios to 93% (**Error! Not a valid bookmark self-reference.**). The last scenario of a smallholder oriented rural development plan paired with a large-scale investment yielded similar increases in per capita income to the full-size large-scale investment scenario (as planned), but maintained a more balanced mix of livelihood strategies.

Table 3.11 Relative differences in per-capita income of both ethnic groups in Gambela Ethiopia across the five model scenarios

Difference in per capita income (gap between groups)				
	Indigenous	Settler	Difference	
Scenarios	(ppp$/capita/day)		absolute*	relative (%)**
Base	0.93	1.32	0.39	41.5%
Forest loss	0.89	1.31	0.42	47.0%
Full Inv (10K)	1.43	2.08	0.65	45.7%
Shock (50% drop)	1.16	1.72	0.56	48.3%
Un-Equal Take-up	1.24	2.39	1.15	93.0%
Inv (5K) + RDP	1.41	2.00	0.59	41.7%

Note: * absolute = Settler - Indigenous; **relative = absolute difference/indigenous income

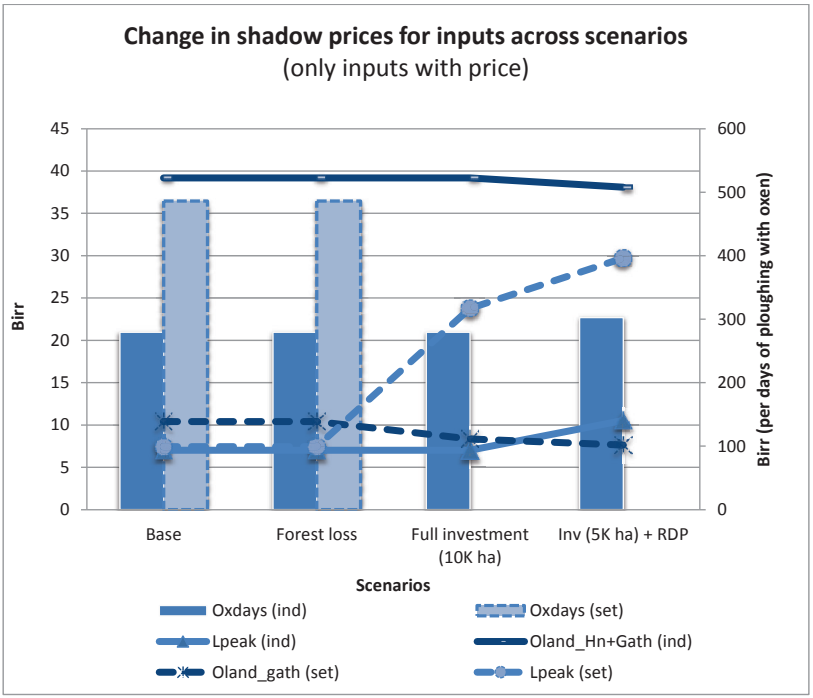
The investment activity boosted the shares of wage employment as source of income for both groups (Figure 3.9 and Figure 7.11 in Appendix). Self-employment activities among the indigenous group also increased significantly in share. However, this came at the expense of local farming activities (the dark bottom section of the columns) and hunting and gathering activities, indicating a structural change. For both groups income from the RNFE increased, amounting to between 50–60% (indigenous) and 60–80% (settler), for the four scenarios.

After observing the change in the 'output' side attributable to the emergence of the investment project, it is interesting to see the underlying change on the input side. Six inputs are required for the set of activities whose cumulative return equates to the total revenue of each group. These inputs are Land (Aland and OLand), Labour (Lp and Lop), Capital, and draft animals (oxen). These are measured in hectares, working days (of one AEU), birr, and ploughing days respectively.

From the optimisation I derived the shadow price for each of the inputs under a given scenario. This was the marginal value if the constraint of this resource would be lowered by one unit. It thus reflects the marginal utility (expressed in monetary terms) of one additional unit for the given group. In this case three of the six resource constraints were binding. The strongest

binding constraint was the amount of Ox for AGR2, followed by peak-labour and hectares of OLand accessible to the local population. Figure 3.10 depicts the change in prices for those factors that have a shadow price. The (dotted) lines represent indigenous (settler) group shadow prices for each working day of an AEU and the use of one hectare of OLand for hunting and gathering. For the lines, the left axis lists the respective unit shadow prices (in Birr). The columns depict the shadow price per oxen day. For the columns the right axis represents the value in Birr.

Figure 3.10 Change in shadow prices for resource inputs across the three model scenarios



Beginning with the change in shadow prices for open access land (OLand), the indigenous group relies on open forest and savannah land. Their aggregated shadow price for the purpose of hunting and gathering (complementary use) was initially at a value close to 40 Birr (US$ 2.44) per hectare and only dropped slightly, once agriculture became more profitable (and labour relatively more expensive). The value remained high. Thus, each hectare makes an important contribution to the overall livelihood situation of households in this group. On the contrary, shadow price for forest land among the settlers was comparatively lower. This is partly explained by the absence of hunting. However, even the comparison of gathering showed a much

higher shadow price for the indigenous than for the settler group (24 vs. 10 Birr; US$ 1.46 vs. 0.61).

Looking at the shadow prices for one unit of labour during the peak season, there was an interesting development across the two scenarios. The shadow prices began slightly above 7 Birr (43 cent; US$ 2.23 in ppp) for each group.[210] These prices remained the same for the two initial scenarios, but then increased. For the indigenous group there was a slight increase once more employment was generated, increasing the peak labour constraint for working a full-time job and/or cultivating on their own plots. The price rose further once agriculture activities became more profitable in the 'rural development scenario.' A similar pattern emerged for the settler group, however, increases were much higher. They reached 23 Birr (US$ 1.40) in the case of the full investment and nearly 30 Birr (US$ 1.83; US$ 9.55 in ppp) as the rural development plan further increased agricultural yields. Notably, the wage level for manual labour at the investment site in February 2011 was 23 Birr/day and rose to 30 Birr/day in the spring of 2013, which despite inflation indicates an increase of close to 10%.

The shadow price for a day of ploughing (yoke of oxen) was much higher for the settler group compared to the indigenous group (485 vs. 280 Birr/day; US$ 29.57 vs 17.07 per day). The field survey data revealed that some members of the highlander group pay between 600 and 900 Birr (US$ 37 to 55) to have a one hectare ploughed. Since in the model I assumed four ploughing days for a hectare of land, the shadow price seems slightly high for the settler group. One possible explanation is that the true price was lower, as an owner of an ox would not get such a high price in the presence of cash constraints and the risk of crop failure. However, if I use values from the literature, which suggests that farmers in Ethiopia might share between 50% and 75% of their harvest for having their field ploughed, these values seem very realistic again.

The shadow prices among the indigenous groups dropped, as off-farm and business opportunities opened up. With the observed transition of labour from agriculture to the non-agricultural sectors of the local economy, the ox-constraint lost its binding nature. Suddenly there were enough oxen within the settler group to plough all of the fields cultivated. In this situation manual agriculture also vanished from the settler group. For the indigenous group, initially no oxen were available. Their marginal utility for one ox would be as high as 280 birr/ US$ 17 per ploughing day. As the higher yield varieties and the 'rural development plan' scenario were introduced, the marginal utility increased.

[210] This seems a realistic value since prior to the establishment of Saudi Star wage levels for daily labour ranged approximately 13–16 Birr/ 79-98 cent (US$ 4-5 in ppp) (i.e. a wage that is slightly above shadow price) and thus compensates a worker for the forgone return of working on his own plot (Proposition-1).

3.5 Limitations of the model and discussion of findings

"All models are wrong, but some are useful"
(Box & Draper, 1987, p. 424)

In the research presented in this chapter, I developed a model that links theory with data in the context of a foreign investment in the *woreda* of Abobo, Ethiopia. Model simulations revealed various impacts on the composition and levels of income of the two major ethnic groups in the local population. A number of limitations to the analysis remain. (i) The model assumed complete flexibility of household members across activities (i.e. if a job opens up, labour will have access to this new opportunity, regardless of factors such as proximity to family, etc.). (ii) The profit maximisation behaviour assumption does not capture risk behaviour of local actors. Though, using conservative estimates with regard to changes in work availability for the local population (only 1/3 of the projected workforce), I tried to incorporate this concern into the simulation parameters. (iii) I did not attempt to capture gender specific impacts of the land investment project context, however, these are likely to be significant as—depending on the technology applied—labour demand was highly skewed towards men. This may have implications for the work burden of women, who may increasingly be responsible for domestic household work and also subsistence agriculture tasks.

Finally, there are a number of aspects that the analysis does not capture and would be relevant to explore in further research: (i) Food security is not part of the model. The decline in subsistence agricultural production due to a shift to increased reliance on wage-employment might contribute to a shortage of local food supplies, which can only be compensated for when local food markets allow for purchases. (ii) The model only predicted the value of direct economic benefits from the land and natural resources, such as value of forest products. This fails to consider the wider value of ecosystem services that forest and scrubland provided prior to being converted to commercial agriculture, such as watershed preservation, protection against wind erosion, etc. If those 'losses' were valued, the direction of the impacts of commercial land investments might change. (iii) The model also did not include potential local economy-wide gains from large commercial agriculture investments, e.g. the feedback on the Ethiopian rice value chain as a whole.

Results from linear optimisation revealed a number of interesting findings. With regard to levels of income five key points stand out: (i) The 'non-intensive' use of open-access land, namely hunting and gathering activities, contributes significantly to the livelihoods of both groups living in the area. Thus, the transfer of 10,000 ha of open bush-land and forest to the investor and subsequent conversion into farmland led to a decrease of overall income of both groups. (ii) This

loss of income was overcompensated by increasing employment and marketing opportunities. Agricultural and gathering activities subsequently lost significance as sources of income and less land agricultural land was cultivated by the local population, who allocated their resources (land, labour, time) increasingly towards the production of local goods/services and wage employment. Incomes of both groups rose by about 50% once the investment operated at full scale. Implications for food production and consequently food security are not clear. (iii) These income gains, however, come from a single source of employment and as the simulation of a production-shock showed, would be reduced considerably in the case of mismanagement of the farm or external shocks. This would even push parts of the population back below the poverty line of US$1.25 per day. (iv) The unequal up-take of employment opportunities has the potential to sharpen inequalities between the two social groups. This becomes even more apparent if the conflictive situation with some members of the Anyuak community is not resolved in a constructive way. (v) A more integrated rural development plan, assuming only half of the investment project size paired with increased private or public spending in smallholders' productivity and infrastructure would have the same poverty alleviation effects, but would also significantly increase agricultural production among smallholders.

The underlying logic driving these income effects was partly revealed by the changes in factor prices. This analysis revealed that: (i) opportunity costs of labour in scarcely populated parts of Ethiopia will rise, especially during the annual peak of farming activities. This is consistent with the observed wage increases in the area since the onset of the investment. (ii) Shadow prices for open woodland and forest were especially high among the less commercially integrated group. Marginal utility of one hectare of forest-land even reached as high as 45 Birr (US$ 2.74; 14.3 in ppp) per year, which is higher than the initially planned rental price of the investor.[211] Finally, labour saving technology such as oxen for ploughing fields instead of manual planting has a high shadow price. This high price fell as soon as a structural shift away from mainly agricultural livelihood activities occurred, as the example of the settler group showed. For both groups, agricultural land did not (yet) show a positive shadow price, as forest can be converted into farmland by investing labour.

[211] Such price, however, only reflects the benefits from direct use under the conservation of existing biodiversity. If costs for the loss of non-direct benefits would be added, conversion of forest to commercial farming might only be 'socially desirable' at high output levels.

4 LONG-TERM IMPACTS ON TECHNOLOGICAL AND INSTITUTIONAL CHANGE: LARGE-SCALE AGRICULTURAL INVESTMENT IN BUGIRI, UGANDA

4.1 Introduction and framing of analysis[212]

In this chapter I present an analysis of the long- and mid-term impacts of LSAIs on the population in their vicinity. This case complements the neoclassical, ex-ante analysis of the early stage impacts in the Ethiopian case with an institutional economic, ex-post analysis.

4.1.1 The spread of new crops and institutional change: what is the role of LSAIs?

Eastern Uganda has become the rice basket of the nation. While lowland rice cultivation existed in the country since the Second World War, the crop only became popular domestically over the past two decades. Its spread originated in eastern Uganda and is believed to have been triggered, in part, by large-scale rice production in the wetlands of Kimba and Doho. One of these schemes has been privatized and is now operated as a commercial rice company that supplies the higher end domestic market and exports to neighbouring East African countries. Tilda Rice Company Uganda Ltd. (hereafter Tilda) started operating in the area in 1997 and cultivates rice on 1,200 ha. In the vicinity of Tilda's operations there are also small-scale rice farmers on plots ranging 0.1–2.0 acres (0.05–0.8 ha). Most of the wetlands have been transformed into rice fields, and millers and rice traders are located along the road. In a recent review of the potential impacts of LSAIs on food security, the FAO (Arias, et al., 2012, p. 141) found that: "*Transnational corporations such as Tilda Uganda Limited have contributed to increased food production in Uganda*." The authors justify this statement based on the continuous expansion of area under rice cultivation in Uganda, which correlates with the onset of Tilda's activities there. In this chapter I present my examination of the veracity of that statement.

As the case of Tilda underlines, LSAIs in Uganda are not necessarily a new phenomenon. Most of the existing LSAIs began operations before the millennium and some date back to colonial times

[212] Parts of this chapter have been presented at the UN-WIDER annual conference on Inclusive Growth in Africa. A paper and the presentation are available online at the institute's webpage (see: Baumgartner 2013).

(see Chapter 2). Given their history, these older LSAIs offer an opportunity to explore the mid- and long-term impacts of LSAIs on local small-scale agriculture. In my analysis I considered Tilda's history since its inception in 1968 as an example of an LSAI and explored its impact on the current livelihoods of the local population.[213]

4.1.2 Objectives and conceptual framework

The mechanism and dynamics of how rice became the main staple crop in the area is not well understood. With the exception of Elepu and Nalukenge (2009), the links between the LSAI and local smallholders have not been addressed by prior research. The main focus of the research presented in this chapter lies in the channels of institutional and technological change. These changes then explain (at least partly) why today transactions of rights over valuable assets (factors of production, outputs, etc.) are governed this way. Precisely, I sought to answer the following four research questions:

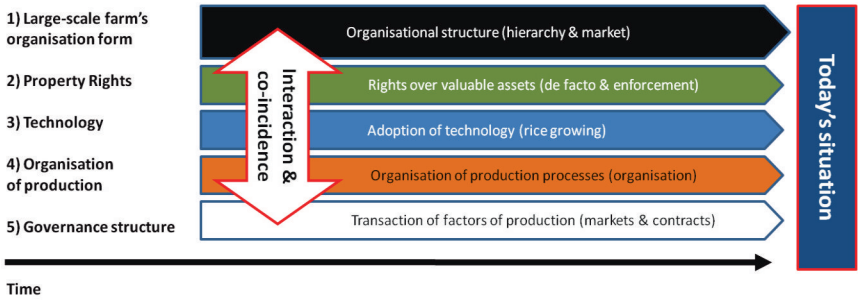
1. *Does the LSLA affect local level **institutional change,** especially the emergence of property rights and exchange of those rights (land markets)?*
2. *How did the **adoption** and **dissemination of technology** (rice cultivation) take place? How were they related to the LSAI?*
3. *Did **organisation of lowland rice production** change over the past decades? How is this related to the LSAI's activities or to its internal governance structures?*
4. *How does the **governance over the transaction of production factors and outputs** between the LSAI and local smallholders change (interaction)?*

Conceptual framework: In this chapter I adopted an *ex-post* perspective on the impacts of an LSAI on local livelihoods. The analysis concentrates on Level 2 and Level 3 of William's (2000) layered approach to social analysis and examines historical changes across five dimensions to explain the current situation (Figure 4.1). These five dimensions are: (i) the organisational evolution of the LSAI itself, (ii) the establishment of private property rights over previously untenured land (wetlands), followed by the evolution of a rental market for the wetlands, (iii) the introduction of new technology and subsequent technological change, (iv) the formation of farmer groups (organisational change of production and processing), and (v) the current governance of the production process at the local level (i.e. the 'playing of the game' or contracting of transactions). As I was interested in better understanding the impact of this particular LSAI, I related the last four to the evolution and organisational changes of the LSAI

[213] I analysed the impact of a project that started more than 40 years ago, as compared to the Ethiopian case that was only four years' old when I collected the field data.

(see the top black arrow in Figure 4.1). Due to the limited scope of the research I only partially discussed other interactions across the five dimensions in my analysis.

Figure 4.1 **Five core dimensions of the conceptual approach to the analytical narrative on institutional and technological change in the Bugiri district, Uganda**



Note: While the first channel relates to the understanding of the (internal) organisation of the LSAI, the other four correspond to the four research questions and focus more strongly on the rural economy surrounding the LSAI.

4.1.3 Theoretical foundations

Since the end of the Cold War, economists had to adjust their understanding of economic growth. Initially saving and investment (Solow, 1956), as well as technological change (Romer, 1986, 1990), were considered the key driving forces of economic growth. Since markets are not created overnight, research has increasingly focused on the emergence of institutions (e.g. North, 1990; Eggertsson, 1996; Acemoglu, Johnson, & Robinson, 2001; Rodrik, Subramanian, & Trebbi, 2004). Economic transactions are governed by their institutional environment and economists and other social scientists continue exploring why these environments change or resist change (see e.g. Khan & Jomo, 2000; North, 1990; E. Ostrom, 1990, 2005; Williamson, 2000).

> *"Institutions are humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies."*
> (North, 1996, p. 344)

In this quotation, North defines institutions and their three core characteristics: *Prescription* (rule/constraint), *form* (informality/formality), and *enforcement*.[214] In this context a rule can

[214] Institutional economics builds on ideas regarding the importance of *property rights* and *transaction costs* first introduced by Coase (1937, 1960). They were further elaborated by property rights economists from the Los Angeles-Seattle school, Alchiam, Demsetz, Posner and others. Analysis of the

be defined as "*[…] generally agreed-upon and enforced prescriptions that require, forbid, or permit specific actions for more than a single individual"* (Schlager & Ostrom, 1992, p. 250). Thus, a rule relates to shared understanding among at least two individuals.[215] These authors defined operational actions as "*[…] constrained and made predictable by operation-level rules, regardless of the source of these rules*" (ibid. 1992, p. 250; own emphasis). Hence, rules govern behaviour, even if self-imposed by a group of people or prescribed by a formal government. Rights are the product of rules. Rights refer to particular actions that are authorized (V. Ostrom, 1976), in the sense that rules refer to the prescription of authority and rights are the authority over something.

Property rights[216] define the rights for the use of valuable assets and their protection from destruction (Alchian & Demsetz, 1972; Alchian, 1965). Thereby they secure the (future) economic rent from the use of such assets (Khan & Jomo, 2000).[217] Conceptually, five different types (or dimensions) of property rights of a valuable asset can be distinguished (Schlager & Ostrom, 1992). These five dimensions are 'access', 'withdrawal', 'management', 'exclusion', and 'alienation'.[218] A property right can be held by a single person, a group of persons, the state, or a private enterprise. In addition, rights can be limited to a defined period (e.g. season), product type (e.g. fuel wood but not timber), or other condition (e.g. in times of drought).[219]

"Users of a resource who have developed de facto rights act as if they have de jure rights by enforcing these rights by themselves."
(Schlager & Ostrom, 1992, p. 254)

Unchallenged *de facto* rights determine individual behaviour as much as *de jure* rights. Only when de facto rights are challenged does the difference becomes apparent. In some cases de

economics of organisation, especially work on the firm by Coase and later Williamson (1985) played a key role.

[215] An individual's plan might also have prescriptions as defined above, but should be called a 'strategy' in that regard.

[216] The economic use of the term does not correspond with its role in legal theory (Eggertsson, 1996).

[217] On the importance of rents for the function of markets see Stiglitz and Weiss (1981). The importance of the distribution of future rents for the development path of an economy is elaborated in an analysis by Khan and Jomo (2000) of South and East Asian economic transformations.

[218] The most relevant operational level property rights are 'access' and 'withdrawal'. These two build what is sometimes referred to as 'user-rights'", which have to be distinguished from the 'decision-rights' or 'decision-maker-rights'". The latter have the capacity to define the former.

[219] For the same piece of land, different individuals and groups might have overlapping rights(e.g. a farmer may have the right to manage, access and to harvest crops, a herder may have rights to access and utilize pastures only during the dry season, and community members may have the right to access and trespass, but only for the harvest of fuel wood. In this regard the term property as a '*web of interests'* has been instrumental (C. A. Arnold, 2002; Meinzen-Dick & Mwangi, 2009).

facto rights might eventually be given recognition in court. Until then, they are less secure than de jure rights.

If the property rights over attributes of a valuable asset are transferred from one individual or group to another, a transaction takes place. In that regard, trade within institutional economics is the exchange of property rights for various attributes of a valuable asset, rather than an exchange of the asset itself (Eggertsson, 1996, p. 14f.). Transaction costs can be understood as the costs of measurement and enforcement, to protect resources in voluntary exchanges, such as trade, as well as costs to prevent involuntary exchange, such as theft (ibid.).[220]

Private ordering between the parties involved in a transaction is a frequent method of settling disputes and managing contracts. Governance of every transaction has to "*[…] craft order, thereby to mitigate conflict and realize mutual gains*" (Williamson, 2000, p. 599). This highlights the three key dimensions of any transaction: *mutuality, conflict,* and *order*. A governance structure shapes incentive structures. One form of governing exchanges is to establish a contract. A contract reflects the situation of both parties, including their institutional environment and internal control cost structure. Here it is important to highlight that in institutional economic analyses, contracts are a 'theoretic fiction,' and do not require the form of a written legal document. They can be reflected in the rules of trading networks, such as informal norms or even religious beliefs (Eggertsson, 1996).

An organisation describes the joint cooperation of actors to secure user rights over resources (enforce property rights) or produce jointly (North, 1990). The types of organisations that emerge depend on the institutional framework and what activity it incentivises.[221] If robbery is favoured, gangs might evolve, but if productive economic activities are rewarded, firms are more likely to emerge. Common objectives or goals lead groups of people to organise themselves. Thus, an organisation is the outcome of the 'process of organising.' Therefore, "*[…] the core of organization involves changes that order activities so that sequential, contingent, and frequency-*

[220] It can further be distinguished between internal control and external control over resources. The *internal control* is enforced by the actors themselves through investments made to gain control over scarce resources. This includes construction of fences, hiring guards, monitoring goods, as well as investing in reputation or other measures that increase the security of control (or reduce the likelihood of theft, expropriation, etc.). *External control* depends on formal and informal institutions, such as statutes, laws, norms and customs, etc., that constrain actors' behaviour and secure property rights for given individuals or groups. In this case transaction costs refer to "*[…]an actor's opportunity costs of establishing or maintaining internal control*" (Eggertsson, 1996, p. 8). In a closed economic system, at the level of aggregation of all individuals, the distinction between internal and external control disappears.

[221] North (1996, p. 346) distinguishes four types of organisations: political bodies (parties, councils, regulatory bodies), economic bodies (firms, farms, unions, cooperatives), social bodies (churches, clubs), and educational bodies (schools, universities).

dependent decisions are introduced where simultaneous, non-contingent, and frequency-independent actions had prevailed" (E. Ostrom, 1990, p. 39). Once the organisation is established, it creates common meaning among its members by forming a pattern of communication that provides members with information, assumptions, goals, and attitudes that shape their decisions and make decision-making predictable (Simon, 1955, 1957).

The logic of any organisation is challenged by asymmetries within its membership in terms of availability of information, or the costs associated with gaining access to information. This problem is sometimes overcome through a third party (Alchian & Demsetz, 1972) or as a group manages to collectively establish a *credible commitment*, sustain a monitoring system, and enforces punishment (E. Ostrom, 1990).

Institutional Change: There are two predominantly referenced concepts on institutional change, which partly complement each other. They draw attention to different aspects and drivers of institutional change, which are interlinked: technology and agency.

Technology-induced institutional change: The seminal work on the 'nature of the firm' by Coase (1937) has brought the concept of transaction costs to the heart of economic analysis. If the costs of transaction are very low in the market, there is no need for a firm to internalize transactions within its structure. If, however, transacting in the market is costly (e.g. because of high enforcement costs), it is profitable for the firm to internalize these transactions. In other words, transactions are internalized if the marginal costs of transacting exceed the marginal benefits of the transaction. The costs of transacting are—at least partly—a function of technology. In this vein, Coase argues that under a *given* technology, a firm will chose a governance form to suite that technology. This implies that a firm will restructure the exchange of property rights to minimize the costs of exchange (transaction costs). This recognizes a causal relation between technological change and institutional arrangement.

North and Wallis (1994) further develop this theory. They distinguish 'transaction costs' from 'transformation costs'.[222] The latter describe *"[…] any costs of physically taking land, labour and capital and making physical things*" (North & Wallis, 1994, p. 609). In their view, growth driven through technological change, that reduces transformation costs, is ultimately limited by rising transaction costs. Thus, growth is not only driven by technological change, as assumed by

[222] In line with this distinction they re-write the production function of a firm with the firms output depending on labour (L), land (D), capital (K), and intermediate inputs (IG) for transformation and transaction, plus entrepreneurial input (E), technique (T), and institutions (I). The letters *a* and *f* denote transaction and transformation costs respectively: $Q = f(L_f, K_f, D_f, IG_f, L_a, K_a, D_a, IG_a, E; T, I)$ (North & Wallis, 1994, p. 11).

growth theory until the 1990s, but also driven through institutional innovations, especially in organisation and governance, that minimize transaction costs.[223]

Technological change does not happen automatically. Actors need to adopt new technologies before they will impact on the institutional environment. On the individual level, farmers' willingness to adopt new technologies depends on their knowledge of benefits and risks as well as their socio-economic status. For example, a study in Ethiopia revealed that younger farmers with larger properties located closer to markets were more likely to investigate new technologies (Admassie & Ayele, 2011).

Actor-driven institutional change: While institutions, as a framework of formal and informal rules, govern actors' behaviour, actors (can) shape these rules to bring about institutional change. One such example is the formation and enforcement of property rights through their definition among resource users: "*Property rights may also originate among resource users. In some situations resource users cooperate to define and enforce rights among themselves. Such rights are de facto as long as they are not recognized by government authorities"* (Schlager & Ostrom, 1992, p. 254).

Similarly, the formation of an organisation, that determines its internal rules to coordinate the actions of its members and to render others' decision-making predictable, with the final goal of achieving the maximum common benefit, is an institutional innovation in itself. Once an organisation is founded and has created a credible commitment to punish the violation of established rules (e.g. respecting rotation of water withdrawal, etc.), the organisation becomes an institution. In that sense, an organisation may be an actor itself, as well as an emerging institution in the domain of work collaboration (Aoki, 2007).

> *"[T]he interaction between institutions and organisations […] shapes the institutional environment of an economy. If institutions are the rules of the game, organisations and their entrepreneurs are the players."*
> (North, 1996, p. 345)

For the case presented, both theoretical perspectives help understanding institutional change. They indeed complement each other, as will be shown below.

[223] Since the 1960s, technological change has been a key factor driving economic growth. To gain a deeper understanding of how this change occurs, it is necessary to go beyond neo-classical economic analysis (Rosenberg, 1976), which tends to focus on efficient resource allocation under given technology (L1—in layered analysis).

4.1.4 Analytical approach and data sources

Institutional analysis is prone to focus on the *form* of institutions (e.g. presence or absence of a cadastre for property rights), rather than on the *function* they perform (Chang, 2010).[224] Taking a historical perspective and looking at the evolution and change of institutions over time within a given context reveals the change in both the form and functionality of institutions. This particular type of analysis was labelled 'analytical narrative' (Moore, 1966; Rodrik, 2003).[225] It uses a combination of qualitative and quantitative information to support a 'probable' narrative that explains the current (observable) situation.[226]

Institutional change is a multidimensional, multilevel phenomenon that empirical studies cannot capture in all its complexity. Any empirical study has to be simplified in various ways: (i) scope of analysis, (ii) limitation to one/a few central theoretical concepts (such as agency, collective action, etc.), (iii) treatment of time, and (iv) political system variations (especially in the case of cross-country studies) (Alston, Eggertsson, & North, 1996). Causal relationships are difficult to establish, but a structured response to the preceding four points should reveal the driving elements of the observed 'emergent order' (see Table 4.1).

Table 4.1 Core components of the institutional analysis of the evolution of the Tilda/Kibimba rice company in the Bugiri district of Uganda

	Bugiri context
Scope of analysis	Community-level analysis of institutional and technological change (in the local rural economy). Five aspects: PRs over wetlands, land rental market, rice production, organisational change of the company and neighbouring smallholders, and the governance of transactions between the company and smallholders.
Central theoretical concepts *	• Layers of institutional analysis (Williamson, 2000) • PRs as a bundle of rights with distinction between de facto and de jure rights (Ostrom & Schlager, 1992) • Change of governance structure regarding transactions (transaction economics: market ↔ hierarchy) (Williamson, 1986, 2000)
Treatment of time	*Ex-post* analysis of the past five decades (1960s–2011) (Rodrik, 2003)
System variations	Changes in the ownership structure of the LSAI (development scheme –> state farm –> private sector) within the Uganda context

[224] This is especially true for cross-country economic analyses based on institutional indices (e.g. Kaufmann, 1999).

[225] Bates et al. (1998), in their book on analytical narratives, suggest five main questions that narratives must answer to provide credible and explicit explanations: 1. Do the assumptions fit the facts as they are known? 2. Do the conclusions follow the premises? 3. Are its implications confirmed by the data? 4. How well does the theory stand up by comparison with other explanations? 5. How specific is the explanation and does it apply to other cases? (pp. 14–18).

[226] There are a number of other studies using a similar approach (see e.g. Acemoglu, Johnson, & Robinson, 2003; Bates et al., 1998; DeLong, 2003; Subramanian & Roy, 2003; Väth, 2013).

Source: based on Alston et al. (1996).
Note: * The central theoretical concepts are explained in this chapter, apart from the layered approach which is discussed in Chapter 1.

Data sources: The lack of panel data prevented me from reaching statistically robust conclusions about causal relationships.[227] Cross-sectional household survey data in combination with an evaluation of semi-structured biographic interviews with rice growers form the core of my analysis. To evaluate the current situation in this case study, I derived descriptive statistics from the primary data (own household survey, N=170). I constructed an asset-based wealth-index following a principal component analysis (PCA) to make comparisons across groups.[228] Prior to the collection of survey data, contextual information was gathered through consultation with experts and key informants, including: a rice researcher, agricultural economists, Japan International Cooperation Agency (JICA) staff, and other informants in Kampala. Contacts in the Bugiri district were identified and local government officials provided valuable information, approved the research, and identified additional informants during the first field visit. Focus group discussions were organised and conducted with three groups of farmers in April 2011. In addition, village heads or other well-regarded community members were interviewed about the impacts of the investment over recent decades. The company manager was interviewed once in Kampala and again on site during a second field visit. The company did not oppose the research, but was also not particularly cooperative. However, it agreed to complete a questionnaire containing key questions regarding current production status and interactions with local communities.

In addition, I conducted semi-structured biographic interviews with 14 rice farmers in four localities near the LSAI site. Using 10 open-ended questions, the questionnaires attempted to stimulate a personal narrative on four major aspects of interest. [229] The four interview localities are the villages of Igogo, Namasere, and Nainala B., and the Buwuni trading centre. Buwuni and

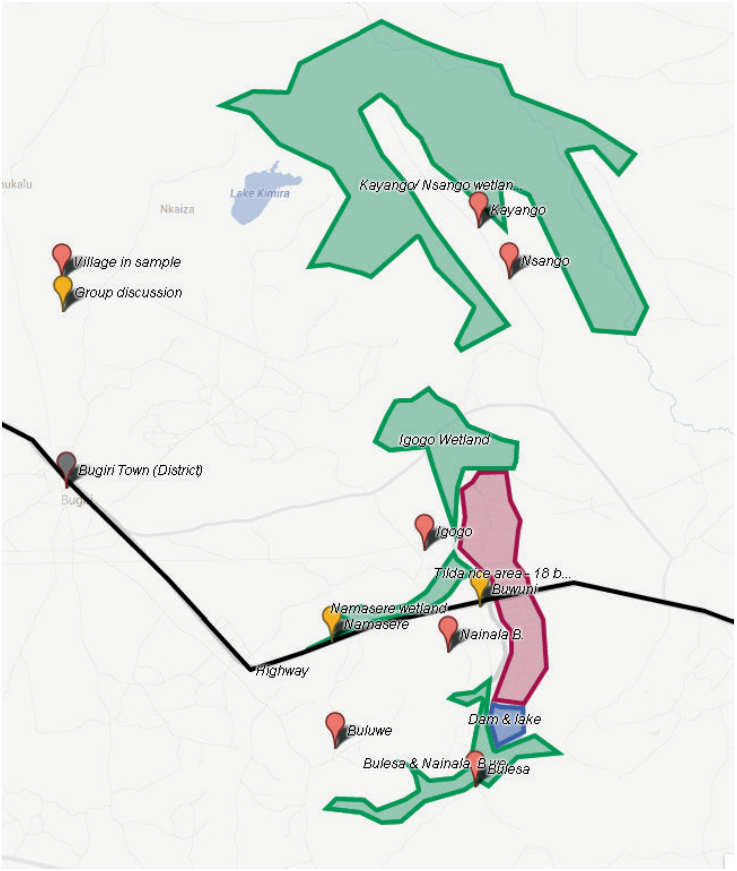
[227] See the discussion on ontology and to what extent a researcher or their methods are able to explain causality or rather to support or refute explanatory hypotheses based on observed phenomena (Section 1.3).

[228] The asset index analysis was adapted from the framework recommended by the Bill and Melinda Gates foundation (BMGF, 2010; in Njuki et al., 2011). It is calculated for all movable assets including livestock. Each of the assets is assigned a weight and then (where applicable) adjusted for age (see Table 7.22 in the Appendix). The indicator's values are normalized around the mean using a Hazel transformation (Cunnane, 1978). Assets have the capacity to not only explain current wealth, but also to indicate the potential of different groups to form a capital base (accumulation) over previous years. It thus qualifies as a better ex-post indicator of wealth or poverty than income, which is subject to greater fluctuations (Fafchamps & Quisumbing, 2002; Carter & Barrett, 2006; Nielsen et al., 2012).

[229] The questionnaires covered questions regarding: the original acquisition of wetlands for rice farming, including their transfer or rental; the use and change of technologies to cultivate rice; their relationship with the LSLA; and how they are organised with regard to production, water management, and marketing. A list of these farmers is included in the Appendix (Table 7.20).

Igogo neighbour Tilda's fields and have both been deeply involved in the company's activities since its inception in 1968 (indicated by red dots in Figure 4.2). Namasere is located immediately west of the property, but has access to the same broad strip of wetland. Many of the local farmers started cultivating rice in the late 1980s. Nainala B is located south of the Tilda property and marginally further away from the main road (see Figure 4.2 for a map of the study site).

Figure 4.2 **Map of wetland areas, Tilda rice fields, and selected villages in the Bugiri district, Uganda**



Source: created using Googlemaps (2013).

The selection of these villages was based on contextual information about where rice cultivation began locally and where workers were initially recruited from. Farmers from Buwuni and Igogo have been actively involved in rice production since the onset of the LSAI, while residents of Nainala B. and Namasere started growing rice under the 'second wave' of the LSAI's development. Stratification for the sampling frame was developed based on the information gathered from field visits and focus group discussions. Six villages were randomly selected and a total of 170 households were surveyed (Appendix 7.4 for more quantitative data details). The in-depth interviews and household survey provide the principal body of data used for the analyses presented in this chapter. Secondary sources, such as government reports and related academic literature were used to complement the data and to frame it within the broader Ugandan context.[230]

4.2 Country context and the Ugandan rice sector

4.2.1 Country overview

Uganda is a landlocked developing country that is ranked among the 33 least developed countries (LDCs) in Africa.[231] The total land area is 240,040 km,^{2} out of which 66% is agricultural land and 18% is open water. In general, an equatorial lowland climate with limited variation in annual temperature and humidity prevails.[232]

Uganda had 35.87 million inhabitants in 2012 (estimations by UBOS, 2013). Its economy is still predominantly agrarian, with approximately 70% of the population reliant on agriculture for their livelihoods. Approximately 87% of the population lives in rural areas and 34% of these rural residents are poor. Circa 180,000 km^2 (18 million hectares), or more than 80% of the country, is cultivated by small-scale producers.

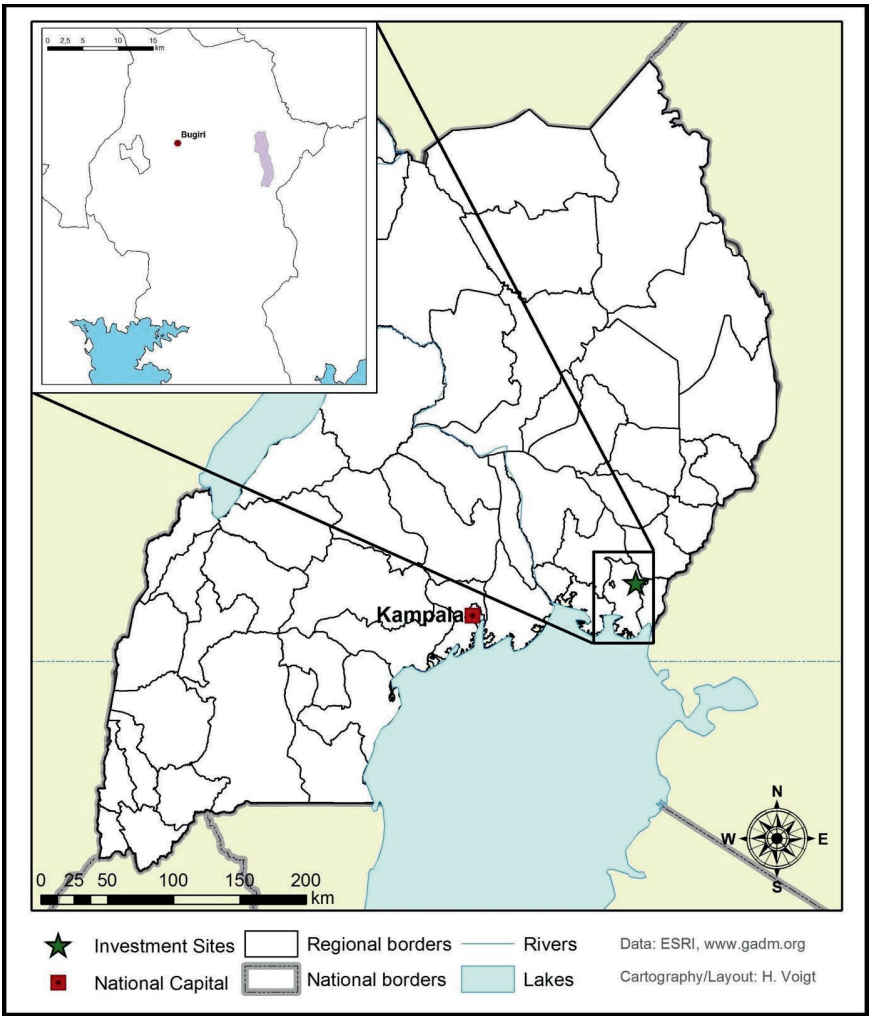
[230] Unfortunately, secondary data on land distribution and properties at the district or parish level were not available. Some information was obtained from government documents in Kampala at the district level, as well as from JICA experts and Tilda personnel. This problem is also described by (Yamano et al., 2011) who studied the impact of rice cultivation training on the adoption and diffusion in some sub-counties of the Bugiri district in Uganda.

[231] A more detailed discussion of the history and prevailing land tenure systems are provided in Section 2.2. Uganda is bordered by five countries: South Sudan, Kenya, Tanzania, Rwanda, and the Democratic Republic of Congo.

[232] On a more detailed level, four major agro-ecological zones can be distinguished: (1) a high altitude zone in Kigezi, Sebel, parts of Ankole, west Nile, Toro, and Mbale where temperate-zone crops may be cultivated; (2) a pastoral arid to semi-arid zone in east Ankole, west Masaka, Karamoja that supports pastoral activities; (3) a short-grass prairie zone in the north and east that supports mixed cotton-finger millet production systems; (4) a tall-grass prairie zone in the south and west that supports a mix of perennial and annual crops.

Uganda became fully independent in 1962. During the first 25 years after independence, the country experienced frequent regime changes and repressive rule under Idi Amin and Milton Obote. Since the 1990s the Museveni administration has proposed profound political reforms to establish a more democratic, participatory state with a sufficient tax base, civilian political control over the military and policy, and sound economic growth. Since then, Uganda has become the 'pearl of Africa', and a 'donor's darling', where economic policy reforms and poverty reduction efforts seem very promising (Ellis & Bahiigwa, 2003). Between 1987 and 1996, GDP grew at an impressive 6.5% per annum and despite high population growth per capita GDP increased by 3.4% annually. The share of people living below the poverty line declined from 56% to 44%, and more recently to 31% in 2005–06.

Figure 4.3 Map of the districts of Uganda, Bugiri is enlarged



The current National Development Plan proposes a private-sector led agriculture development strategy (GoU, 2010). Thus, the priority of the national agriculture policy is to *"[...] pursu[e] a private sector led and market-oriented economy. In doing this the government will work on constraints that hinder the private sector to invest more in agriculture*" (MAAIF, 2010, p. 28).

4.2.2 The Ugandan rice sector

Rice production in Uganda began in 1942, when small amounts were produced to feed British soldiers during World War II. Today, Eastern Uganda is the major lowland rice growing area in the country.[233] In the 1970s, two Chinese rice cultivation projects introduced a variety developed by the International Rice Research Institute.[234] According to a study commissioned by the Ministry of Agriculture, Animal Industry and Fishery (MAAIF), 80% of Ugandan rice producers are small-scale farmers who use simple technologies, rain-fed cultivation, and operate on less than 2 ha. Another 15% are medium-scale farmers who operate under similar conditions on 2 to 6 ha. Small- and medium-scale rice farmers often use non-motorized tools such as line-makers. Finally, about 5% of rice producers are large-scale operations on more than 6 ha. This broad category includes the large rice production operations mentioned above. Processing capacity is limited by old machinery. This limits the quality of milled rice, which cannot compete in international markets.[235] Trading is organized through the private sector, mostly by intermediaries who buy rice at the farm gate or miller and sell at local markets or in the capital. Prices range from US$ 0.63 to 1.05/kg for lower quality rice, while polished and packaged higher quality rice from the commercial producers can reach market prices ranging from US$ 1.05 to 3.16/kg (in 2009).

Rice became a priority crop in 2004/2005 and was prominently promoted by the country's vice-president.[236] The National Agricultural Advisory Service (NAADS) began providing extension services for rice cultivation, focusing on upland rice production, especially using the NERICA 4 variety. In 2007 production was an estimated 165,000 tonnes and consumption reached 225,000 tonnes, making Uganda a net-importer of rice (MAAIF, 2009).[237] In 2009 the GoU published the second Ugandan National Rice Development Strategy (NRDS), which lays out ambitious plans for tripling the total national production (MAAIF, 2009).[238] Interestingly, the

[233] Many swamps and valleys are used for rice cultivation, accounting for about 2% of Uganda's total wetland area (GoU, 2010). As in other parts of the country, there is a conflict between agricultural use of wetlands and indirect benefits they provide to flood and watershed management, as well as wildlife habitat, etc.

[234] These producers were the Doho and Kibimba farms. While the Doho operation was partly transformed into a farmer's cooperative, Kibimba was privatized and is today known as the Tilda rice company. Kibimba began on 600 ha, Doho began on 1.000 ha.

[235] The vast majority of rice (ca. 95%)is milled with Engelberg or Milltops mills, and only 1.7% is milled in modern mills (MAAIF, 2009). Tilda possesses the most modern mill in the country.

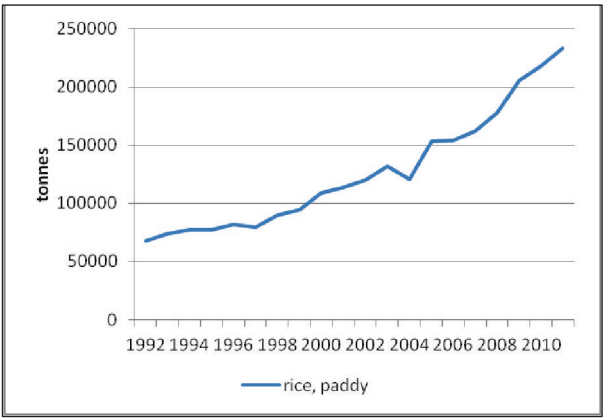
[236] Prof. Gilbert Bukenya was vice president of Uganda between 2003 and 2011.

[237] In Uganda approximately 65,000 ha are under rain-fed lowland rice production, 5,000 ha are irrigated lowland rice production, and 40,000 ha are rain-fed upland rice production.

[238] Necessary policy measures stated in the strategy are: "*Strengthening the Institutional Framework; Research, Technology Dissemination, and Capacity Building; Production, Multiplication, and Dissemination of Certified Seed; Improve Irrigation and Water Management; Increase Utilization of*

GoU/MAAIF perceives more potential for the expansion of upland rice production, as there is more upland production area available.[239] Other rice experts have proposed intensification of lowland production as the corresponding yield gaps are more likely to be closed with limited improvements—especially through training in cultivation practices and some modern inputs (Kijima, Ito, & Otsuka, 2012). According to FAO data, total production in 2011 reached 233,000 *t* (Figure 4.4).

Figure 4.4 Total annual rice production in Uganda, 1992–2011



Source: FAOSTAT, accessed Jun 12, 2013

Uganda has high rice production potential. About 10% of its territory is lowland wetlands that are suitable for rice cultivation (Kijima et al., 2012).[240] It was estimated that in 2000 about 6–7% of the country's total wetlands had been converted to agricultural, urban development, or industrial use (GoU, 2010), and on-going population pressure in rural areas continues to drive this trend.

Agro-Inputs and Sustainable Soil Management; Post harvest Handling, Processing, and Marketing; Mechanization; Access to Agricultural Finance; and, Policy Development."(MAAIF, 2009, p. v). Under the Development and Strategic Investment Plan (DSIP) 2009/10–2013/14 MAAIF/GoU has committed over 300 million UShs (ca. US$ 126 000) directly to rice production, excluding other indirect investments.

[239] Despite the mentioned government interest in boosting rice production, nationwide in 2009 there were only ten permanent full-time staff involved in rice related research or administration, with an additional 85 part-time and project staff. JICA has four more senior experts working on improving rice production along the supply chain (MAAIF, 2009).

[240] As in other parts of SSA, in Uganda rice can be grown in upland, and both irrigated and rain-fed lowland areas. The areas with the highest potential for productivity growth in SSA are rain-fed lowland areas, as upland rice production is not necessarily sustainable and the construction of irrigation infrastructure is beyond the financial capabilities of small-scale producers (Miyamoto et al., 2012).

4.2.3 Bugiri context

The Bugiri district is located in eastern Uganda. It extends from the shores of Lake Victoria, where it shares borders with Kenya and Tanzania, and northeast towards the mountainous Elgon region. According to the 2002 census Bugiri hosts 426,527 people, resulting in a population density of 278 persons/km^2, a considerable increase compared to 165 persons/km^2 in 1991. While the district is far away from central Uganda and its capital Kampala, it is relatively well connected to transportation infrastructure as it is bisected by the northern transportation corridor from the Kenyan coast through Uganda to Rwanda. The district is predominantly rural with 84% of the population living in rural areas and about 90% depending on agriculture for their livelihoods. Production is typically on small properties averaging about 2.2 ha (GoU, 2007). The main staple crops are millet and cassava, with maize also grown commercially and for subsistence. Coffee, cotton, maize and increasingly rice are major cash crops cultivated by small-scale producers. Agricultural practices tend to be rudimentary with most agricultural labour provided by farm families. "*Mechanization is very minimal and restricted to large commercial farms like those managed by TILDA (U) Ltd at Kibimba*" (GoU, 2007). There are approximately 611.3 km^2 of arable land in the district and in 1999 an about 75% was under cultivation (GoU, 2007) (see Table 7.19 in the Appendix). A significant proportion (~40%) of Bugiri consists of wetlands (631.1 km^2).[241]

4.2.4 Asset base and HH expenditure of rice grower compared to non-rice grower

The two most visible impacts the LSAI is assumed to have had on the local population is the technology transfer of rice growing and the employment generation at the farm. Both can be traced in the cross-sectional data collected in 2011. In the last season of 2010, one third of the households interviewed did grow rice. Looking at the asset-based wealth-index for rice farmers versus non-rice farmers a significant difference in assets accumulated is revealed. In addition, households who send at least one member over the past 12 month to work at the LSAI possessed on average less (movable) assets (Figure 4.5).[242]

[241] Three quarters of these are seasonal wetlands and the rest are permanent wetlands.

[242] For further information, disaggregated by type of asset, see Figure 7.14 in the Appendix.

Figure 4.5 **Asset indicator for rice farmer and households having a member working at Tilda, Uganda (HH-Survey 2011)**

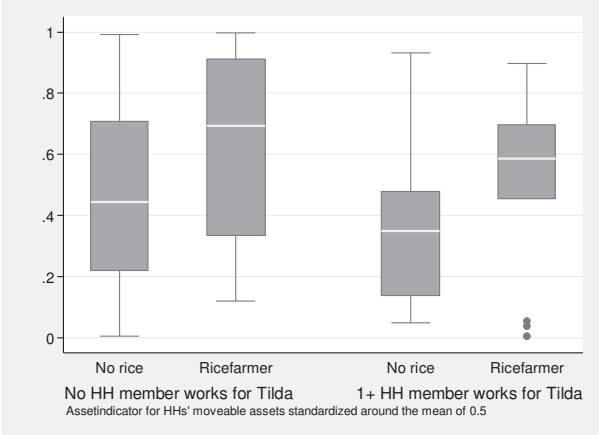
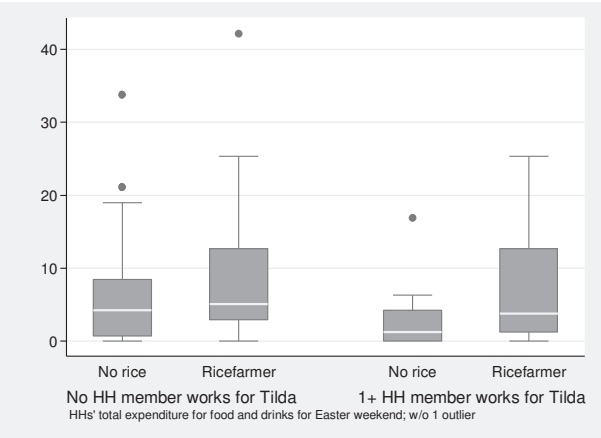


Figure 4.6 **Expenditures for food and drinks over 2011 Easter weekend, per rice farmer and households having a member working at Tilda**



The survey was conducted ten days after Easter and the Easter weekend was thus found an appropriate comparison for consumption expenditure.[243] The consumption data confirms the same, that those households growing rice and having no member working at the LSAI are—on average—best off, followed by rice farmers with a member working at the LSAI. The poorest

[243] The share of Muslim households in the area was below 10%, and there was no correlation found between religion and rice-growing. Mann-Whitney test supports this difference in expenditure between rice farmer and non-rice farmer (z = - 2.416; p = 0.015).

households tend to have a member working at Tilda and do not/are not able to grow rice. These descriptive statistics, however, do not say anything about causality or how this situation as captured in today's cross-sectional data, emerged. The following section will thus evaluate the historical trend that led to the observable situation of today.

4.3 Analytical narrative from the Bugiri district, Uganda

4.3.1 Evolution of the large-scale rice farm in three steps: development scheme (1968–1992), state farm (1992–1997), and private company (1997–today)

In August 1965 Ugandan Prime Minister A.M. Obote visited China.[244] On this visit the idea of developing rice production in Uganda was conceived and the eastern part of the country was identified as an area with high potential. The Chinese started two projects: the Kibimba Rice Scheme (KRS) (1968–1988) and the Doho Rice Scheme (DRS) (1976–1985).[245] The Kibimba Rice Scheme was initiated in August 1968. In 1972 the cultivation of rice began and local people—especially from the neighbouring sub-counties, Kibimba, Buwuni and Igogo—were employed and trained in rice cultivation. The Kibimba wetland was subsequently converted to rice production, initially covering about 600 ha. During the first phase of its operations the KRS was as a rice technology development centre where various varieties were tested.[246] In addition, the Chinese operated a brick factory, an orchard of economically valuable tree species, as well as a poultry and pig farm.

In 1988, 20 years after the establishment of the KRS, the contract with the Chinese ended. At that time the government of Museveni had recently seized power in Uganda and the contract was not renewed. Reliable data on the viability of the scheme is not available, but farmers reported that KRS was then operating on 1,000 ha (interviews B3, B2, B7). However, the management decided to lay off half of the permanent staff. In 1988 the company had approximately 430 permanent employees and many temporary workers that assisted during peak activity periods, especially during transplanting. In 1990 another third of the staff was laid

[244] Diplomatic relations between China and Uganda began in October 1962 and intensified over the following four decades despite the political turmoil in Uganda. The Government of Uganda voted in favour of China at the UN general Assembly several times (1971, 1996, and 2000). Economic and technical cooperation focused on rice cultivation, porcelain production, and construction of the national stadium in Kampala. In addition, several cultural exchanges took place.

[245] Initially KRS operated on 600 ha as a rice technology development centre and DRS (on 1,000 ha) focused on seed production and promoting rice production. Both continue to be major rice production operations in eastern Uganda (Yamano et al., 2011).

[246] The varieties *K5* and *K23* have been the two most popular rice varieties and are still cultivated in many parts of eastern Uganda.

off, and in 1992 a substantial proportion of the remaining workers was fired. In that year the last Chinese experts left Uganda and KRS was fully transferred to government management (B10).

In 1992 the KRS was transformed into the Kibimba Rice Company (KRC), a government parastatal with the mandate of producing rice on a commercial basis. Since the new management was not yet capable of managing the full cultivation area (12 blocks), it provided four blocks (approximately 400 ha) to a group of contract farmers (out-grower) founded by former company employees and one Chinese expert (B3).[247]

The KRC was put up for sale and the Tilda Rice Company Uganda Ltd. (Tilda) won the tender and bought the state company for 2 million UShs in 1996 (ca. US$ 850,000 nominal/ US$ 1.9 million in 2010 prices). The British-Indian management of Tilda took over operations in early 1997. Initially the company collaborated with the in-grower organisation, but in mid-1998 the company reclaimed all of the cultivation area and expelled the group's members cultivating there.[248] This led to major tensions with the local communities that continue to affect relationships between the company and local communities. Over the past 15 years Tilda has expanded cultivation to 1,200 ha and is currently operating on 16 blocks. Further expansion is limited by the capacity of the dam used to store water for irrigation and the availability of land. Between 2004 and 2008 Tilda operated a contract farming program.[249] In 2010 the company produced 8,000 *t* of rice and received an additional 3,000–5,000 *t* from local farmers. Tilda has a 99-year lease agreement with the national government. It pays rent for the grounds and property to the sub-county. Tilda employed up to 1,000 daily workers during the expansion of the company's operations (CQ). There were 180 permanent staff members in early 2011. In 2009 Tilda announced plans to extend operations to eventually 10,000 ha of rice cultivation. This 'public-private-partnership' (PPP) between MAAIF, Tilda and the Islamic Development Bank was approved by the GoU in September 2013 (Parliament of Uganda, 2013).[250] Plans from

[247] The large-scale rice producers divide cultivation area into blocks, each of which represents an operational unit, usually with a block manager and staff that manages each block.

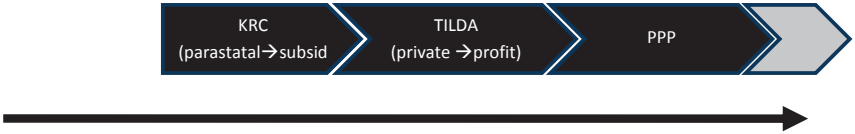
[248] In August 1998 conflict between members of the out-grower association and Tilda management erupted (B3, B10). Tilda did not wish to extend lease agreements with the out-grower group, but rather intended to resume management of the plots. The out-growers had already planted rice and were expecting to harvest their crops later in the year. Tilda prevented the irrigation of fields used by the out-growers. Some farmers were able to make do without irrigation due to sufficient rainfall for proper germination, but in August Tilda ploughed under all standing crops. This caused massive tensions between the company and the two local communities from which most out-growers originated (B1, B3, B10). Tilda later offered a compensation of 40 kg rice to farmers who lost harvest, however, most refused this offer as it was perceived as ignoble.

[249] I discuss the performance of the contract-farming arrangement and reasons for its collapse in the section on organisational change below. For a details see Elepu & Nalukenge (2009).

[250] Project costs for the Tilda extension were estimated at US$ 32 million in 2009 (Muwanga, 2009). The main focus lies on raising the dams capacity from 4.5 million cubic meters to 15.76 million cubic meters, construction of irrigation infrastructure and develop the 6,000 ha of land (Parliament of

2013 foresee to increase the production area of the nucleus farm by 3,000 ha and develop additional 3,000 ha for small-scale farmer as out-grower. The current information is not clear on how these out-growers will be selected and/or how current land holders' rights are recognized (ibid.).

Figure 4.7 Historic evolution of the Tilda rice farm's organisational form, Bugiri, Uganda



Note: KRS = Kibimba Rice Scheme, KRC = Kibimba Rice Company

4.3.2 Institutional change: evolution of property rights over wetlands

Traditionally land tenure and natural resource use rights in the eastern part of Uganda have been determined by clans. Often parcels of land stretched from hills down to streams that served as property boundaries.[251] During the first half of the twentieth century clan leaders had the right to allocate land to households according to their need. Initially these households became proprietors of the agricultural land allocated to them. They had full user rights and were entitled to manage the land and to pass those rights on to their descendants. Clan leaders, however, remained the nominal landowners on behalf of the clan, with the right to pass on management and exclusion rights (alienation). In addition to these privately allocated plots for agriculture and domestic use, substantial parts of each clan's territory remained as communal land.[252] Wetlands, for example, were used by all members for fishing and grazing activities, as well for planting some crops during annual dry seasons or during times of drought (E1). At that time, only the few plots used for agriculture had individualized rights. The transfer of land was either through inheritance from parents to their children or if the clan leader agreed to re-allocate land to newcomers.

Uganda, 2013). Tilda furthermore stated in earlier media interviews to include substantial investment in power generation at the site, mainly by using husk and straws for energy production.

[251] Natural boundaries would indicate boundaries where one clan's area ends and the next clan's territory begins.

[252] For an introduction to the formalization of land rights in Africa see Benjaminsen & Lund (2002). Peluso & Lund (2011) explore the changes in access to land over recent decades and the drivers of these changes.

Before the establishment of the KRS in 1968 the wetlands were mostly either used for grazing or left untouched, with some cultivation of yams and rice in lowland fields.[253] According to local experts and farmers who were interviewed or participated in the group discussions, currently all of the wetlands in Namasere surrounding Tilda's operations are privately owned by local farmers.

The '*scramble for wetlands*' started in the mid-1990s, when a significant proportion of the population began cultivating rice. I identified four factors that drove this trend in Bugiri: (i) arrival of new technology/crop, (ii) organisational change of the LSAI; (iii) changes in the relative prices of other crops, and (iv) population growth.[254]

"I went to swamp and just started to cultivate the piece of land that I thought I can manage by myself."

(B12: a 50-year-old Buwuni farmer who began cultivating rice in 2002)

Interviews with a number of older farmers revealed that some of the earliest rice growers began on their own plots in the mid-1970s (B7, B3).[255] Many older farmers had opened up their land by removing native papyrus and turning the swampy soils before attempting to cultivate rice. This indicates that farmers took action and invested (mainly labour) into preparing land to create and protect their rights to access, withdrawal, and manage those plots as well as to exclude others from using those areas. At that time swamps were undisturbed apart from limited papyrus cutting, livestock grazing, and minimal crop production during the dry season. The situation is well described by the statement from one 73-year-old farmer (B3): "*People whose land stretched to the wetland appropriated the wetland*." This reflects the de facto tenure rules that were accepted and enforced by the communities at the time: those who have land bordering the wetlands were also the legitimate owners of adjacent wetlands. Traditional demarcations such as trees and canals or streams were used to delimit individual plots.

In the early 1970s a few farmers in the village of Bugiri next to the KRS site began cultivating rice. According to statements from various interviewees, their number increased over the 1970s and 1980s. The main motivation for growing rice was the financial benefits. In that regard, farmers were *pull*ed into growing rice to augment their income.

[253] Further west of Bugiri, wetlands were primarily granted to migrants who arrived in the area between the 1960s and 1980s. Today these migrants lease these plots back to the original indigenous population, which seeks to plant rice in the wetlands (E1).

[254] While population growth occurred throughout the period covered in my analysis, I assumed that land scarcity only became severe in the past decade or so.

[255] This is illustrated by a quote from a rice farmer and village vice-head: "*Kibimba started in 1971 and farmers who went there for employment acquired rice cultivation skills, and currently no wetland remains idle*" (B1, Igogo).

A second major factor *push*ing farmers to convert the wetlands to rice cultivation was the loss of employment among a large number of former permanent and temporary workers at the two specific points in time described above.[256] These massive layoffs were *catalytic* for the growth of the rice farming in the district, as they motivated the broad application of an untraditional technology.[257]

Two additional factors unrelated to the LSAI also contributed to the spread of rice production in the area: population growth and changes in relative profitability of other cash crops. Population growth increased pressure on land and *push*ed farmers to convert land that had not yet been used for agriculture. The conversion of wetlands was one indicator of this growth. Furthermore, in the early 2000s the price of maize declined, while the price of rice either remained stable or increased (IRRI, 2013).[258] Maize has been one of the main cash crops for farmers in the area and the decreasing returns on maize production partly explain the risky and labour intensive step of preparing new cultivation areas and adopting a new crop.

"There is no land available around Buwuni anymore". (B10; Buwuni)
"Today all land is taken, but expansion is possible through rental markets". (B12; Buwuni)
"No more land for expansion." (B5; Igogo)
"[There is] no land available around Namasere, but you can rent it from an individual." (B9; Namasere)

Note: These quotes refer to lowlands suitable for rice cultivation.

As above quotes from local rice farmers indicate, today all of the wetlands are privately owned. This was a consequence of the aforementioned drivers of the '*scramble for wetlands*' in the

[256] It was particularly notable during interviews in the village of Igogo, located approximately 3 km north of the Tilda's operations, that most farmers (or their parents) had begun growing rice in 1989. In 1988 the Chinese had to lay-off a significant share of the permanent staff and reduce production considerably. The local population, which had relied on cash income from employment at KRS, subsequently applied the skills acquired there to the remaining wetlands and started cultivating rice on their own account. The production of this cash crop served as a substitute for the lost employment. The privatization of the parastatal company and subsequent take-over by Tilda in 1996/97 was the second seminal point that triggered the growth of rice production in the area. Tilda closed the brick factory, orchard, and other non-rice related activities of the former operations and downsized the number of staff at the mill. Former permanent staff was compensated. In one village it was reported that this compensation was then invested in the acquisition of wetlands around Namesere, upstream from the LSAI.

[257] A big landholder in the village of Igogo stated that, "*before the land was transformed into rice production, the wetlands were used for grazing livestock, until 1989 when we started growing rice*" (B7, Igogo).

[258] This trend was further enhanced through the introduction of an import tax on rice in the mid-2000s (IRRI, 2013).

district, and especially around the LSAI site. In the villages where I conducted the biographic interviews there was no land left for agricultural expansion, but renting land remained an 'easy' option for gaining access to land (rental market). Interviewees reported that there are suitable wetlands available in more remote areas (B13, B6).[259] Conversion to rice production was most pronounced in the wetlands directly neighbouring the investment site, and expansion continues in wetlands that are further away. This spatial trend was also reflected by differentials in rental prices across villages, with the highest prices in villages nearest to the LSAI site (see below).

To summarize, property rights over wetlands passed from traditional collective right holders (clans) to individuals (farmers with holdings adjacent to wetlands) over the second half of the 20th century. These individualized ownership rights were respected even if a farmer did not yet use the wetlands, as the story of one female rice farmer (42-year-old) in Namasere confirmed. She reported having started growing rice in early 1990 and had to prepare the wetland herself (i.e. it had not yet been used for agriculture). The wetland was inherited from her parents and her ownership rights were not challenged (B11).[260]

4.3.3 Evolution of the wetland rental market and revaluation of wetlands

The renting of wetlands has become standard practice in the Bugiri district. Many interviewed farmers indicated that they rented at least some of the land used for rice production (B1, B3, B4, B5, B13, B6). Large-scale producers rent some of their wetlands if they are not cultivating it themselves (B8). A female farmer in Nainala B (B4) mentioned that it was not difficult to rent land, "*[…] as many weak, older ones or those who want to take a break rent out their land*". It appears that the elderly and those with other income sources more often rented their land to farmers. One owner of a large property in Igogo indicated another motivation. The two main reasons for renting out his land were to earn cash income, which he partly uses to invest in his remaining property, and to meet social obligations. Within the village, social cohesion motivates some owners of larger properties to rent out land to those in need.

Rental agreements are not written, but rather they are typically verbal. Sometimes they are made in front of a third party, but in general the parties rely on trust. Tenants must pay rental fees up-front and landowners normally rent on a seasonal basis. As a result many tenant farmers cultivate a different plot each season (B5).[261]

[259] Land for the expansion of rice production was available until 2005 in most villages.

[260] A rice farmer in need of land could always approach other farmers with available wetlands (B4).

[261] The frequent change of plots impedes the application of fertilizer and measures to increase long-term soil fertility. Several farmers indicated that degradation of soils was a challenge for them.

On indicator of the functionality of the local land market is the share of plots rented by farmers as reported in the household survey. In both seasons 23% of the total plots were rented or borrowed from relatives. The share of rented plots among plots where rice was cultivated was higher than the average for all plots during both seasons. During the long season (Aug-Nov) close to 30% of the wetlands were rented and during the short season nearly 40% of the plots were rented. The higher share of rented wetlands over the short season may be explained by the higher risk of crop failure on upland plots. Thus the opportunity cost of labour invested in rice cultivation versus growing upland food crops is lower, incentivizing farmers to rent land during the short season. Among crops, rice was one of the three crops grown most frequently on rented plots (together with cassava and peanut).[262]

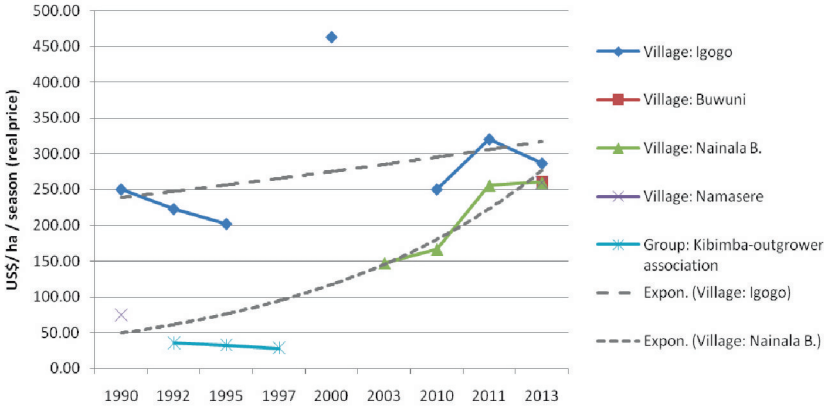
If land has become scarcer over the past three decades in Bugiri, this scarcity should be reflected by rental prices. Assuming that a major household investment, such as land rental fees is recalled appropriately, I used the rental fees reported by interviewees to analyse the spatial pattern of price variability within the district.[263] By controlling for inflation and converting rental fees to price per acre prices, I was able to use these few data points to depict the rental price patterns across villages over the past 20 years (Figure 4.8).

Overall Igogo was the village with the highest mean rental prices, while Nainala B. had relatively lower mean prices. Price ranges for use-right over hectare or wetland for one season rose from between US$ 75–220 in the 1990s to US$ 166–320 in the 2010s (an increase of 30% to 400%). While these ranges do not offer a very precise description of prices, there was an observable upward trend. In Figure 1.6 the interrupted lines indicate trends for these two villages and thereby depict how the range of local rental prices has evolved over the past two decades. In 2013, farmers rent wetlands at about 790K UShs/ha (ca. US$ 333, 2013 price; and ca. US$ 260 in 2010 price) each season. In one community prices range even up to ca. US$ 500/ha/season. The downward trends for Igogo and among the contract farmer group are explained by nominal stable prices that were discounted for the 2010 price. Several sources reported the same rental price for the years described.

[262] There was a slight increase in the proportion of rented plots as the distance from households increased. But even within a very short distance (less than a five minutes' walk from households), 12% of the plots were rented.

[263] The customary unit of spatial measurement in this part of Uganda is a '*catala'* (16 catala are equivalent to one acre, 0.4 ha). The nominal price for land was around 1,500 UShs per catala in the mid-1980s (ca. US$25/ha). Farmers from several villages reported that during the late 1980s and early 1990s rental prices (nominal) rose to around 5,000 UShs/catala/season (ca. US$83/ha), which appears to have remained constant until the mid-2000s when nominal prices rose again in some villages to 8,000–16,000 UShs/catala (ca. US$133-266/ha). In 2010/2011 rental prices (nominal) in most villages were at 20.000 UShs/catala/season (ca. US$ 333/ha). In Igogo some farmers reported prices of up to 30.000 UShs/catala (ca. US$500/ha nominal price, 2013 prices) (B11).

Figure 4.8 **Trends in the rental prices for wetlands among selected villages of the Bugiri district, Uganda (1990–2013, 2010 real prices)**

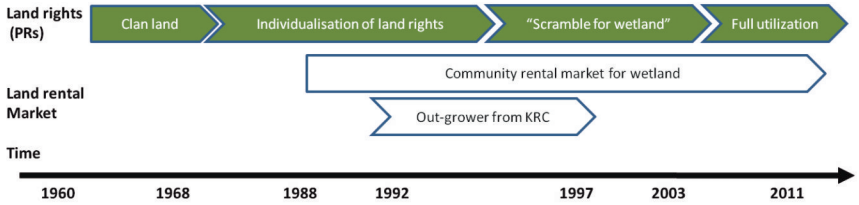


Source: own data, recall questions from farmers and group interviews.

Note: Prices were deflated using World Development Indicators and standardized for 2010 prices (World Bank, 2013); prices were converted to seasonal rent per acre even though local farmers usually rent much smaller pieces of land (0.1–0.5 acre/0.04–0.2 ha); the exchange rate was from January 2011 (Oanda, 2013).

In Figure 4.8 it is clear that the price paid by members of the contract farmer association operating on KRC land between 1992 and 1998 was far below the market prices in the surrounding villages. Farmers there paid about 35 US$ per ha/season at the time, about 12–16% of contemporary rental market values in the neighbouring wetland of Igogo Village. This dual market might have existed for two different reasons. State management officials may not have been aware of local rental prices level. The other explanation, which I find more convincing, is that under state management there was not a sincere effort to generate income through rental agreements, rather there was an emphasis on maintaining the rice production operations and on feeding the mill.

Figure 4.9 **Historic evolution of individual land rights over wetlands and the emergence of a land rental market in the Bugiri district, Uganda**



4.3.4 Technological change: the introduction of rice as a new crop and its diffusion

The Bugiri region, together with the Doho wetlands, is currently considered the 'rice basket' of Uganda. National lowland rice production is concentrated in these districts. Using the household survey data, which is representative of the communities located near the LSAI, I explored the status of rice cultivation in early 2011.[264] In the survey rice growers were asked how they had acquired their skills. The vast majority of farmers reported having learned rice production practices either from their parents (33%) or neighbours (40%). Fourteen per cent of the respondents reported having acquired the skills during previous employment with the LSAI (i.e. either during the Chinese administration or from working at Tilda). A small share mentioned having acquired skill through government extension services (4%) or other sources (7%). These results indicate that the main source of technology transfer occurred from one generation to the other either from parents or through experiences with peers, neighbours, or relatives.

Rice growers were also asked when they began farming rice. Most farmers reported that they started to grow rice after 1998 (78%), which may be partly explained by the smaller share of older farmers participating in the survey. I labelled these younger farmers third generation rice growers because potentially there were two generations of growers before them. The first generation includes those who started to grow rice before 1988 (i.e. before the first large lay-off of KRS employees). The second generation are those farmers who started growing rice in 1988 and includes those who became rice farmers up to 1997 when the LSAI was privatized. The first generation is not well represented in my survey, which was one reason to complement the survey data collection with additional in-depth semi-structured biographic interviews with older rice farmers (see the next section). The second generation is represented in the survey, but

[264] I asked farmers whether they knew how to grow rice. Close to two-thirds (58%) reported that they knew how to grow rice, 41% reported not having rice growing skills, and a few declined to respond (1%) (see Table 7.21 in the Appendix). Out of those who reported knowing how to grow rice, about 55% claimed to have grown rice in the past season.

not comprehensively (only 8 out of 51 participants). Table 4.2 summarises the reported sources of rice production practices with the third generation further disaggregated to observe the preceding dynamic expansion of rice production in the area. The year 2003 was used to separate third generation growers for two reasons: In 2004 Tilda reached its current operational size and the Government of Uganda started to promote rice farming as a major rural development strategy (MAAIF, 2009).

Table 4.2 Sources of rice cultivation knowledge by successive generations of rice farmers in the Bugiri district, Uganda

Year started growing rice	Source of rice cultivation knowledge (%)						Total
	Parents	Neighbours	Working at KRS	Working at Tilda	Extension	Other	N
1st Generation (before 1988)	–	33.3	33.3	–	–	33.3	3
2nd Generation (1988–1997)	12.5	50.0	12.5	–	–	25.0	8
3rd Generation-*a* (1998–2003)	42.9	50.0	–	–	7.14	–	14
3rd Generation-*b* (2004–2011)	50.0	26.9	11.5	3.9	3.9	3.9	26
Total	39.2	37.3	9.8	2.0	4.0	7.8	51

Note: see also Table 7.21 in Appendix for further details on rice knowledge.

It appears that as time progressed, learning from parents and neighbours became the most common pathways of knowledge transfer. Neighbours and friends, however, were already identified as important knowledge sources among the first two generations. Extension services only became a relevant pathway after 2000.

Notably, even some farmers who began growing rice over the previous ten years reported having learned to grow rice from work experience at the LSAI.[265] This indicates that some farmers had the required knowledge, but only started to cultivate rice at a later time once they either had accumulated sufficient capital to invest in rice production or were compelled to do so by other factors such as falling prices for other crops, loss of employment, etc. The data summarized in Table 4.3 reveals that many rice-farmers learned how to grow rice as a teenager (20%) or before reaching 30-years-old (65%). Parents and neighbours were again the dominant sources of rice production knowledge.

[265] This has two potential explanations. First, many local farmers were sent to work at the LSAI by their parents as teenagers in order to supplement household incomes. These farmers might have needed a relatively long time to reach a point in their lives at which they were prepared to become independent farmers. Second, locals still refer to the LSLA as Kibimba even though it changed its name after privatization. While enumerators had been sensitized, some miscoding could still have happened during data processing.

Table 4.3 Sources of rice cultivation knowledge according to the age at which farmers began to grow rice in the Bugiri district, Uganda

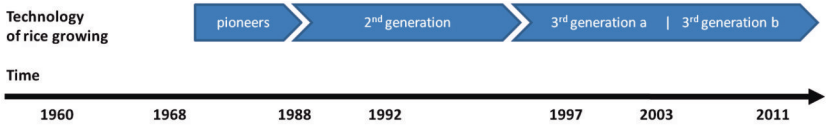
Age when farmer began growing rice	Source of rice cultivation knowledge						
	Parents	Neighbours	Working at KRS	Working at Tilda	Extension	Other	**Total**
10–19yrs	6	4					**10**
20–29yrs	11	7	1	1		2	**22**
30–39yrs	1	5	1			1	**8**
40–49yrs	1	2	1				**4**
50+yrs		1	1		2	1	**5**
Total	**19**	**19**	**4**	**1**	**2**	**4**	**49**

To better understand past developments, I deliberately asked older interviewees about their production techniques, their motivations to begin rice farming, how they acquired land, and how they sell their produce. Most rice farmers started on small plots, often less than 0.1 ha, on an experimental basis to learn about rice cultivation practices. This is not surprising given the high labour inputs required for rice cultivation and the opportunity costs implied regarding the cultivation of other crops or off-farm employment. Some of the pioneer rice farmers interviewed at the Bugiri trading centre explained that they cultivated small plots in the evenings and weekends while working for KRS.[266] Regarding the acquisition of skills, farmers very often made a reference to Kibimba, either through personal experience or through someone who had learned rice cultivation skills there (B4, B6, B8, B9, B10, B13, B14). Several younger farmers had gained knowledge working at Tilda (B7). From the qualitative data I concluded that most first-hand knowledge that led to the adoption and spread of rice cultivation had come from the Chinese.

Three explanations are suggested based on the narratives of the local population: (i) the Chinese effort focused on knowledge transfer and they frequently visited farmers who adopted rice cultivation to help them improve their skills; (ii) the Chinese had healthier relationships with many of the local villagers relative to their modern Tilda counterparts, who appear to have contentious relationships with most local communities; and finally (iii) there may also be what I refer to as a 'life cycle argument', that assumes young people are more likely to work as casual workers in the rice plantation to accumulate capital before getting married and investing in their own farmland. While the Tilda company had already existed for 13 years at the time of the interviews (2013), and it is very likely that many future rice farmers are currently working there as daily labourers.

[266] One farmer reported that after having worked with KRS for five years, he began farming in 1979 on half an acre (0.2 ha). After only two years he managed to expand up to ten acres (4 ha) and rented a tractor from the Chinese to plough his fields (B6). While this case was exceptional, it indicates the local adoption of a new crop and mechanized production practices among the first generation of rice growers.

Figure 4.10 **Generations of rice growers in the Bugiri district, Uganda**



Excursus—constraints on the expansion of rice cultivation in Bugiri, 2011: The lack of available land for further cultivation was reported as the most important constraint on the expansion of rice cultivation. Capital constraints ranked as the second most important, followed by labour shortage. Table 4.4 presents a summary of the most important constraints reported among the three categories of survey respondents. In the two groups that reported they were not growing rice limited capital was the most frequently mentioned constraint, followed by the lack of capacity, and the shortage of land. Interestingly, those who knew how to grow rice, but were unable to cultivate in the season prior to the survey most frequently mentioned capital as the major constraint (44%) followed by the lack of available land for expansion. This suggests that capital would enable them to finance an option—either through renting of land or labour. The last group were respondents who were both knowledgeable about rice growing and had actively grown rice during the previous season. They reported the lack of available land as the greatest constraint (51%), followed by capital constraints (26%).

Table 4.4 **Constraints on the expansion of rice cultivation reported by farmers in the Bugiri district, Uganda (2011)**

Respondent categories	Percentage of respondents that identified constraint as most important					Total
	Labour shortage	Land availability	Limited capital	Capacity limitations	Lack of inputs	N
Does not know how to grow rice/does not grow rice	5.0	30.0	35.0	30.0	–	40
Knows how to grow rice/does not grow rice	8.8	38.2	44.1	8.8	–	34
Knows how to grow rice/currently grows rice"	8.5	51.1	25.5	8.5	6.4	47
Total sample	**7.4**	**40.5**	**33.9**	**15.7**	**2.5**	**121**

Overall, respondents in the group that lacked knowledge about rice growing and had not grown rice were nearly twice as likely to perceive capacity constraints as the most important (30% vs. 16% for the entire sample), whereas members of the group that knew how to grow rice but were non-growers reported being more constrained by the lack of capital (44% vs. 34%), and members of the group of those both knew how to grow rice and were active growers were more constrained by land availability (51% vs. 40%).

4.3.5 Organisational change: restructuring of the LSAI's organisation and the evolution of farmer groups

"Truly among man's innovations, the use of organization to accomplish his ends is among both his greatest and his earliest."
(Arrow, 1971, p. 224)

One of the expected impacts of the arrival and evolution of an LSAI on local conditions is that it will affect the organisation of production. I assume this to be partly a process of organisational change of the actor itself (i.e. internal changes to the LSAI's operational structure to adjust to the local context and external pressures). In addition, the arrival of the new actor will influence how other actors operate within the given set of rules. This might lead to the formation of other organisations, either to complement the new actor (e.g. as an out-grower association), or to adjust to changes in technologies or transactions (e.g. a saving group, collective selling, etc.). The research in Bugiri revealed two phenomena that I consider organisational change. First, the transfer of ownership of the LSAI changed the internal governance structure, which had an impact on the markets for labour, rice, and land for rice production. Second, a number of farmer groups emerged that were related to the LSAI through agency.

Organisational change at the LSAI

The original Chinese administrated LSAI (KRS) started as a rice research and technology dissemination centre. It was established under agreement between the Ugandan national government and the Government of the People's Republic of China and funded through the governments. Rice experts from China worked with locals to test existing and newly developed rice varieties. In addition the LSAI engaged in unrelated operations such as a brick factory for the construction of facilities as well as orchards and a pig farm.

After the Chinese transferred management of the LSAI to the government in the late 1980s, operations were reduced to a minimum level, causing the layoff of many workers. A group of 114 former workers established the *Kibimba Out-grower Association* and rented up to 400 ha of land from the new company. The Kibimba Out-grower Association was registered in 1995. After registration the group could access loans from the Uganda Commercial Bank and the Women Trust, which were mainly used to hire labour and purchase inputs.

In 1996 the KRC was privatized and bought by the company Tilda. The Indian-UK management of Tilda assumed operations in the summer of 1997. Commercial production of rice for domestic and export markets are Tilda's business objectives. From a business perspective, the company achieves these goals effectively; the production process is well structured and it is the leader in

packaging and milling of rice in Uganda (MAAIF, 2009). Tilda's products are competitive in the regional market.

Formation of farmer groups and organised production among smallholders

The cross-sectional data collected in 2011 came from 170 households. From this sample only 15 households reported having one or more members who were part of an organisation. Organisational membership was evenly distributed across the six sample locations, indicating that there is no spatial variation in this respect. Table 4.5 presents a list of the household group membership by wealth (ranked by a standardized wealth-indicator, with a mean of 0.5).[267] The quartiles are designated by the horizontal lines in the table. Only one case belonged in the lowest quartile, while the top quartile includes eight memberships from seven households, with the richest household being involved in two organisations. The relationship was especially pronounced for the farmers' association, where all members are from the top third of the income categories. This table suggests a correlation between organisation membership and asset ownership.

Table 4.5 Household group membership by wealth categories in the Bugiri district, Uganda

No. HH	Wealth-Indicator (standardized around the mean)	Farmers' association	Savings/ credit group	Funeral group	Total
1	0.185		x		1
2	0.391		x		1
3	0.403			x	1
4	0.526			x	1
5	0.591		x		1
6	0.609		x		1
7	0.615		x		1
8	0.644	x			1
9	0.762	x			1
10	0.803		x		1
11	0.838	x			1
12	0.868	x			1
13	0.885	x			1
14	0.915	x			1
15	0.962	x	x		2
	Total	**7**	**7**	**2**	**16**

Note: total number of households (N) = 170.

[267] A principal component analysis was applied for all mobile assets (see Table 7.22 in Appendix 7.4).

Because of the lack of panel data, the causal relationship cannot be clearly identified using this data set. Theoretical arguments in both directions seem convincing: group membership helped farmers to increase their wealth through access to new technologies, credit, etc. and protected their rights in a collective manner. Similarly, it is plausible that wealthier households might have more time and resources to engage in organising their activities, which is initially costly (e.g. time for meetings, fees, etc.). Probably both causal directions play a role in the Bugiri district. I used the data obtained from the interviews and group discussion to explore the origin of some of these organisations, and to reveal how they relate to the emergence and organisational change of the LSAI.

There have been (at least) two cases of managers involved in the organisational evolution in the Bugiri district. First, a former farm manager under the Chinese administration of the LSAI advised the out-growers to form an association with a legal structure and rights, so they could "speak with one voice" (B3). Even though out-grower collaboration with KRC ended with Tilda's take-over of the LSAI in 1998, the group had been managing up to 400 ha of irrigated rice production using tractors and modern inputs. Output was purchased and processed by KRC. Second, the *Kibimba Saving and Credit Group* (KISACS) was initiated by an Indian manager, who encouraged the permanent staff, including the rice-mill operator, to form a savings organisation. Initially, workers were encouraged to join under an agreement that a part of their salary would be immediately transferred to their saving account. This allowed the organisation to build up enough savings to provide credit to its members.[268]

In both cases there were trusting relationships among organisation members. In the course of group discussions with members of KISACS, it became apparent that the opinion leaders were frequently associated with Tilda, even though they were very cautious not to make this link public. After a conflict regarding payments, Tilda has forced KISACS to separate itself from the company and even discouraged workers to continue associating with it (E3).[269] This created a situation in which many members and the acting director of the savings group feared that research would reveal their company affiliation.

Furthermore, positive work relationships at the LSAI facilitated the formation of the rice grower groups. The founders of one rice grower organisation in Namasere had worked for KRS in the 1980s. Many continued working with the out-grower organisation and suffered from poor

[268] Initially KISACS only planned to contribute up to 30% of the total amount invested, but often 80% to 90% is provided to members. Loans range from US$ 40 to US$ 400. Personal credibility (trust) was stated as main reason for selection. In early 2013 the organisation had more than 1,200 members.

[269] In November 2010 a conflict over payments and the formation of an union provoked a strike that escalated into violent conflict during which the health clinic was destroyed and operations at the LSLA were stopped for an investigation into the incident (Ssenkabirwa & Miti, 2010).

relationships between Tilda and the group in 1998 due to the loss of a portion of their harvest. This historical event strengthened the will to become independent and economically successful (common goal). Today the group promotes the integration of fish farming with irrigated rice production.[270] While these examples relate to the company's activities in the region, there were also examples of farmers groups that are not related to the LSAI (e.g. a farmers group currently being established in Nainala B. (B11), where members decided to form a small group to improve the acquisitions of inputs and potentially access loans to build irrigation canals. This is worth mentioning because most households in the survey were not associated with any farmers group.

Contract farming is an option for LSAIs to increase production without incorporating increasing costs from supervising labour. Tilda's modern mill has a capacity of 40,000 tonnes per year. In 2006 Tilda was producing approximately 4,000 tonnes of rice (Elepu & Nalukenge, 2009). This indicates the low level of capacity utilization. Therefore, the company established a contract-farming scheme in 2004 with ca. 600 farmers from Bugiri and three neighbouring districts. The *Kibimba Savings and Credit Scheme* (KISACS) was established and initially managed by company staff as a contract grower organisation to facilitate cash transfers. Elepu and Nalukenge (2009) analysed the profitability of the contract-farming operation and found that a large majority of contracted rice growers received extension services from Tilda (97%), and that many were provided access to credit through the KISACS (85%). Out of their sample, about one third of the growers cultivated land owned by Tilda. These 'in-growers' also acquired seeds from Tilda, giving the company better control over the quality of the rice produced. The company not only supplied contract growers with seeds, but also subsidized some input costs (Elepu & Nalukenge, 2009). The gross profits (Ushs/acre—US$/ha) of participating contract farmers, however, was significantly lower than those of non-contract farmers (Table 4.6). This indicates an economic reason for the collapse of the contract-grower operation. This could also be due to better local market prices compared to Tilda's purchase prices offered to contract farmers, and an argument often made during the field visit in justification for not selling rice to Tilda. Other explanations include higher yields among independent farmers due to better management or greater inputs.[271]

[270] The water for rice irrigation is used for fish ponds before being channelled into the fields, which contributes additional organic fertilization of the soils. The sale of fish produced provides additional income.

[271] Unfortunately not much detail about the contracts was made available by Tilda management and I was unable to access information on transportation costs or how loan arrangements were made.

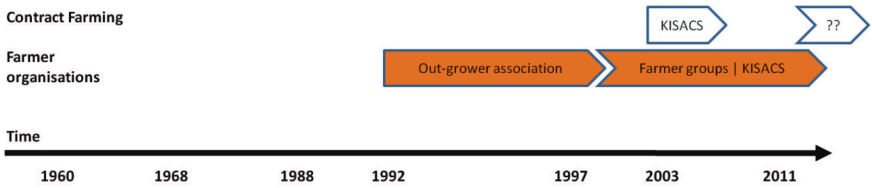
Table 4.6 Mean profitability of farmers by organisational status in the Bugiri district, Uganda

Mean profitability per unit of area (UShs/acre) [*US$/ha*]	Contract farmer (N=72)	Non-contract farmer (N=170)	Total (N=242)
Gross revenues	402,000 [*419*]	414,000 [*432*]	408,000 [*425*]
Total variable costs	334,000 [348]	330,000 [*344*]	332,000 [*346*]
Gross profit	68,000 [*71*]	84,000 [*88*]	76,000 [*79*]

Source: Elepu and Nalukenge (2009), figures are from the 2006 season.

Tilda management claimed that farmers did not comply with contractual agreements (side-selling) and that adequate product quality was difficult to achieve. In addition, Tilda checks rice moisture and filters out impurities before paying for rice by the kilogram, which leads to lower prices than can be attained through local millers or traders. In 2008 the out-grower operation collapsed. In 2011 there were no written contractual arrangements with farmers, but the company purchased rice at competitive prices and made immediate payment, which was appreciated by farmers.[272]

Figure 4.11 Organisations that emerged in response to the LSAIs in Uganda



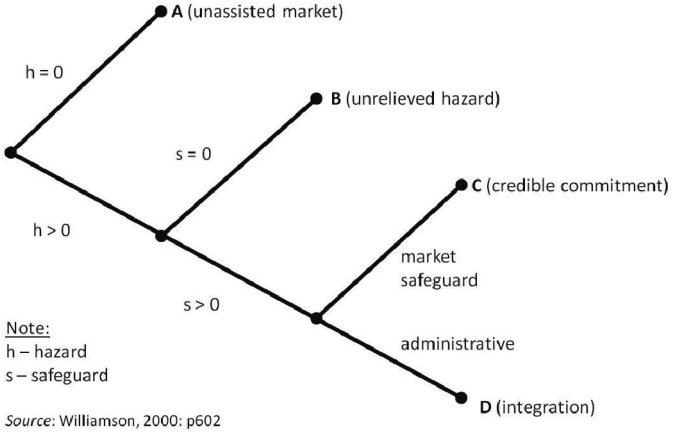
The failure of the out-grower operation indicates that mutual gains were not achieved, and that enforcement and quality control became too costly for the company. Demand for rice in Uganda exceeded supply and local traders had established a system of farm gate rice purchases that was much more attractive to farmers.

[272] According to company records, the total production of Tilda in 2010 was 8,000 *t* of rice on 1,200 ha with 2,5 harvests per year. In addition, Tilda purchased 3.000 to 5,000 *t* from local farmers.

4.4 Changes led to the adoption of transaction governance

If adoption is the central problem of organisation (Hayek, 1945; Williamson, 1985, 2000), it is important to observe how the organisational structure of the LSAI changed over the past five decades and how surrounding smallholder production adapted to these changes. This, however, is not a clear indication of one-way causality, as changes in both—the broader environment (e.g. land and labour markets among smallholder) and at the LSAI—might have affected each other. Transaction costs are, at least partly, a function of technology and can be understood as the opportunity costs of establishing and maintaining internal control. The control can either be internalized into the farm/firm (hierarchy) or formalized through contracts in the market.

Figure 4.12 Theoretical governance structure evolution from simple to complex



Source: Williamson, 2000: p602

I assumed that initially governance structures are simple and only become more complex in reaction to conditions. In a heuristic way, structure moves from market to hierarchy to cope with problems of moral hazard or the lack of market safeguards. While in a market setting parties transact voluntarily, in a hierarchical structure some overarching agreement defines clear order-command structures. Figure 4.12 depicts this evolution from simple to complex governance structure.[273] In the absence of moral hazard problems, transactions can take place in an unassisted, free market (Point A).

[273] New Institutional Economics (NIE) drove economists to consider the key attributes of human actors more explicitly. The following three are among those most frequently mentioned and constitute an integral part of many economic problems: (i) as human brain capacity is finite, resource specialization has its consequences. Actors cannot process all information at the same time, but face *bounded rationality* (Simon, 1955, 1957). This has an important implications for contractual arrangements

If, however, strategic behaviour or asymmetric information access leads to moral hazard problems, these markets stop functioning and actors will refuse to enter transactions (Point B). In the case of safeguards in the market, situation C can be reached through credible enforcement mechanisms or other mechanisms of credible commitment (e.g. trust or mutual dependency of parties). If such market safeguards are insufficient or costly to enforce, firms may attempt to integrate transactions within their internal governance structure (Point D) (Williamson, 2000). Such a shift *from simple* to more *complex* governance arrangements to improve security increases bureaucratic costs. In the following, I apply this logic to the above mentioned four main changes to explore how transaction of the factors of production and rice output changed over the past five decades.

4.4.1 Labour

At the establishment of the LSAI in the area, off-farm employment opportunities were very scarce. During the first 20 years of operation, there were about 430 permanent staff members, who were mainly recruited from local communities. Considering the much lower population size of the area at that time, this means that a large share of households had at least one family member or a relative working at the LSAI permanently with relatively secure income. In addition, casual labourers were hired for transplanting and other manual labour needs. Relations between the LSAI and local communities were described as good during that period (B2, B6, B10). The LSAI not only offered a good source of income, but was also a reliable employer.[274] The state operated large farm was characterized by a hybrid operational form. The contract farming arrangements offered a way to limit labour supervision costs and generate income by leasing land rather. A credible commitment was established and contracts were enforced among the parties. Tilda changed the hiring practice to safeguard itself against hazards through sub-contracting foremen and disengaging in direct labour supervision of manual labour on the rice fields. The new management also reduced permanent staff to 180 people. In this way Tilda avoids monitoring costs and does not need to directly engage in the management of local

designed by human actors; they are unavoidably incomplete and cannot capture complexity in all its dimensions. This relates to the second characteristic; (ii) *opportunism or strategic behaviour*. Individuals do not disclose true conditions or fulfill all agreements. Thus, contracts are not self-enforced, but require credible commitment that violations are penalized and performance is rewarded. Finally, humans have the capacity for (iii) *conscious foresight*. They anticipate potential hazards and include these in their decision making relevant to engagement in transaction with other parties.

[274] Information on past employment might be biased. The elderly are likely to view the past in a better light than actual conditions would infer. Nevertheless, the overall positive perception of these first two decades under Chinese administration of the LSAI supports this interpretation.

labour.[275] The payment for daily labourer is standardized and well known among the local communities. Workers must commit themselves to at least one week of work to a foreman who will pay them after the week is completed depending on their task. In 2011, 16% of the sample households reported that at least member worked at Tilda or had done so in the past 12 month. Out of these, most reported working as a daily labourer 14%, and the remaining 2% were permanent employees.

Thus, the original hiring by the LSAI was based on long-term commitment from both sides (permanent employment), which mitigated conflict, maintained order, and to some extent secured mutual benefits.[276] After privatization and the subsequent emphasis on economic sustainability and profitability, the Anglo-Indian administration adopted a more integrated employment approach that features out-sourcing labour supervision. This has reduced the transaction cost of labour management. Workers complained most about decreased non-economic benefits, such as poor treatment. Further public unrest is now partly prevented by public police forces and guards who patrol the LSAI premises at night.

4.4.2 Wetlands

Transactions involving wetlands became more frequent in the 1990s as the community rental market emerged. In addition to this rental market, many members of the Namasere rice farmer group, who had previously worked at the LSAI under state management, used their retirement/separation payments from the company to purchase land.[277] However, most transactions among farmers regarding wetlands occur through rental agreements. The contractual arrangements, often made verbally in front of a third party witness (B1, B4), served as credible commitment. Thus transacting through market relations among landowners and tenants is feasible.

In addition to these interactions among farmers, there were two distinct periods of land transfers between the LSAI and rice growers: (i) the Kibimba Out-grower Association rented up to 400 ha from the company during the early 1990s. Since the government management was not interested in operating the farm at full-scale, land was rented to farmers at relatively low rates. Rental agreements were made seasonally and were usually extended over longer periods (B3).

[275] In the group discussions and some interviews farmers admitted to having stolen equipment from Tilda while working there. This might have contributed to the erosion of the relationship between the local communities and Tilda.

[276] As mentioned above, the objective of the Chinese administrated LSLA was not to maximize profit, but to train people and introduce new rice varieties. Information on the economic sustainability of the LSLA during this initial phase was not available.

[277] When Tilda took over control of the LSLA and discontinued the orchard and brick factory operations, some of the foremen and higher officials received compensation payments (B1).

After the take-over Tilda resumed management of these fields. (ii) However, during the first 4–5 years under Tilda's administration a number of farmers cleared land for the company under in-grower arrangements. Little information about these arrangements could be obtained from respondents. During an interview with a company manager it was revealed that at that time Tilda was not yet able to fully manage production on 1,200 ha. Thus, it rented out small plots to farmers. In both cases, these transactions ended after management became capable of operating at full scale, indicating that management of labour was not more expensive than maintaining the quality and delivery of rice.

The use of wetlands occurs within a safeguarded (rental) market. Communities/neighbours who are knowledgeable of the set of user rights from the owner to the new renter safeguard both parties against moral hazard and thus ensure enforcement. However, high levels of land degradation due to the lack of long-term investment in soil fertility management were mentioned as one challenge. Customary property rights have protected legitimate claimants' rights. Tilda's current expansion plans might challenge these rights, especially in areas deeper within the wetlands due to a conflicting environmental law that establishes wetlands as government property.

4.4.3 Inputs

The Chinese provided inputs and technical assistance to interested farmers. Rice experts visited fields of early growers (B3). This was part of the objective of government cooperation between (at that time) the two 'socialist brother states'. While I could not obtain information on technical assistance from the state farm to the rice growing communities, based on testimony a close level of cooperation existed between the state farm and the out-grower association. At the time the administrators of the association were employed by the state operated company. The company also provided a tractor rental service and other inputs. The costs of these inputs were deducted from final payments when farmers sold their rice harvests to the company (B10, B12, B3). If growers wanted to keep rice for home consumption they had the option to purchase it back at a subsidized price (US$ 0.25/100 kg versus US$ 0.34-0.38 at the market) (B3). The farmers used their contacts and relationships with fellow farmers to harvest and deliver the rice to the company's mill (B12). Former workers in the association with greater experience not only arranged to rent land, machinery, and other inputs, but also gained irrigation rights. The formalization of the association as a legal entity provided an opportunity to access credit and represent farmers' interests to third parties (B3).

Commitment from both sides was credibly enforced and transactions were governed in a way that avoided conflict and maintained order. While this arrangement seems to have been highly

profitable for the out-growers, no information on the economic viability or degree of subsidy for the state farm was available. Tilda management claims that the government had not been very successful in managing operations. Thus the degree to which the arrangement was mutually beneficial is unclear.

Tilda currently offers seed to local farmers. According to the company management seed prices are below market value. Local farmers claimed that farmers typically procure seeds by either setting aside seed from previous harvests or from their neighbours. According to the survey the most frequently used lowland rice varieties are Weta9 (27%), Bukasolo (22%), Kaiso (15%), and K5/K23 (6%). Weta9 is a variety promoted by Tilda, indicating that about one third of the respondents used a variety introduced by Tilda. The second and third most common varieties are local breeds. The K* varieties were developed by the Chinese (Kibimba). In addition, about 20% of the farmers engage in upland rice production. This is most likely is due to the recent promotion of upland rice production in Uganda. Equipment and other inputs are purchased through local traders rather than the company.[278] During the years that the out-grower operation existed, the vast majority of participating rice farmers was supplied with technical assistance and inputs from Tilda (97%) (Elepu & Nalukenge, 2009).

4.4.4 Selling of rice (outputs)

At the onset of the LSAI, rice was almost unknown in Uganda and farmers neither planted it regularly, nor was there market demand for the crop (B2). Initially, the Chinese administrators provided rice to locals as part of their compensation. This was part of a strategy to popularize and familiarize communities with the new crop, but also served as in-kind payment that might have been less expensive than direct payments. Over the 1970s and increasingly throughout the 1980s farmers began growing rice and sold most of it to the Chinese. During that period there was still little alternative marketing opportunities for the farmers, as the only other mill was located in the neighbouring district (B2). Since the 1990s a number of changes have occurred. The number of rice producers has increased. Initially harvests were sold to intermediaries from Jinja or Kampala (B1). However, as the number of mills in the area increased an increasing share of farmers dried their rice, milled it, and then sold it to the mills or to intermediaries (B3).[279] The state-farm (KRC) bought rice from the out-grower association, which organised farmers to deliver rice to the mill. Under Tilda's management the LSAI has always offered to purchase rice from farmers, however, higher quality standards apply. Tilda had an intense relationship with

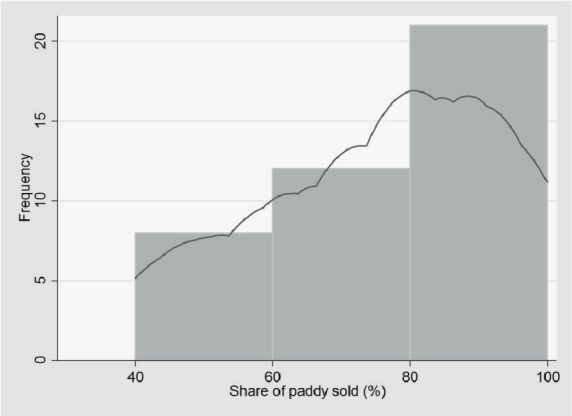
[278] One farmer mentioned that he stole necessary equipment while working at Tilda. Another example of the tense relationship and resulting moral hazard.

[279] The governments electrification program has contributed to the spread of mills in the area (B2).

the out-grower association, which later collapsed. Today a number of farmers continue to sell produce to Tilda, however, most farmers claimed that they preferred to sell directly to traders or mills due to better prices, less quality control, etc.

Using the cross-sectional data from the 51 farmers who grew rice in the season prior to the survey, I derived information on how and to whom they sold their harvests. Rice is a highly commercialized crop in Bugiri. The data summary presented in Figure 4.13 indicates that most farmers sold more than two-thirds of their harvests. Nineteen farmers reported selling their rice to local mills, 25 sold to a trader, and 7 sold to Tilda. Forty per cent of these farmers reported selling rice to a specific buyer, mostly because of prior contractual arrangements (25%) or loans (50%). Thirty-three farmers reported the reasons why they would not sell to Tilda, including: low prices (19), the lack of pricing transparency (6), and poor treatment (6). This indicates that local millers and traders offer better prices and/or treatment.[280]

Figure 4.13 Shares of rice harvests sold in the Bugiri district Uganda (autumn 2010)

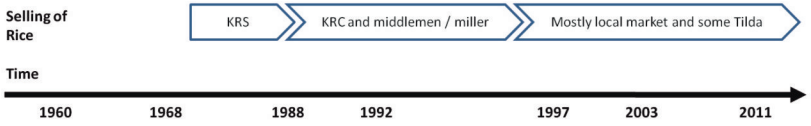


Note: Information on the shares sold were obtained from 41 farmers for the harvest prior to the survey. The line indicates the Kernel density estimate (Epanechnikov). Three households reported that they did not sell any rice and were excluded as outliers.

[280] All farmers were asked what they appreciated in a buyer. The most frequently stated qualities were a good price, quick payment, some advance provided, and no manipulation. Those farmers actually selling to Tilda came from the villages to the northeast of the LSLA (Nsango and Kayago), which are more distant than Igogo and Nainala B. This might have two explanations: first, both Igogo and Nainala B are home to former members of the out-grower association that was expelled after Tilda took over, and thus have a history of poor relationships with the company. The second explanation is related to access: Igogo and Nainala B are closer to the main road and thus prices might be better situated to engage with local markets. Nevertheless, the fact that Tilda does not provide transportation of rice to the mill suggests that farmers farther away would be more apt to sell to local mills or traders.

Market supply linkages of local rice growers, despite being of considerable interest to private investors, does not exist for two main reasons. The farmers are currently interested in getting the best price, rather than establishing a potentially long-lasting relationship with a larger market. The private investor may not yet find an economically viable way to invest in quality improvement of rice provided by the smallholders. The manager explained that the quality of most rice delivered was too low for Tilda to sell in higher value brands (E3, E2). They use this low quality rice for lower quality products sold on the national market.

Figure 4.14 **Historic evolution of the main market partner for small-scale rice growers**



4.4.5 Governance over transactions across organisation models of LSAI

The discussion above illustrates how the governance over transactions of production factors and outputs changed during the past five decades. I was able to partly relate these changes to management changes at the LSAI in Bugiri (Table 4.7).

Table 4.7 **Governance over transactions of production factors and outputs over the organisational evolution of the LSAIs in the Bugiri district, Uganda**

Evolutionary phase of the LSAI	Form of LSAI's governance	Attributes of governance structure/institutional environment (by transaction)			
		Labour	**Land**	**Other inputs**	**Output (rice)**
Before the LSAI	–	Family labour, little exchange	Communal land & private plots	Not used	Subsistence orientation
Kibimba Rice Scheme	R&D centre (*focus*: technology transfer)	Permanent contracts & in-kind benefits (rice); no other labour market	No change; conversion of wetlands for rice cultivation	Little change; some hiring of equipment from Kibimba	No market for rice
Kibimba Rice Company	State-farm (*focus*: rice production & profit)	Layoffs; less-direct control	Establishment of out-grower group (contract); Land rental market evolves	Supply of inputs and equipment from LSLA (loan)	Selling of produce to LSLA; Emerging market for rice and milled rice; increase in mills
Tilda Uganda Limited	Private company (*focus*: rice production; export quality)	Additional layoffs with compensation; Indirect hiring of casual labour (minimising labour management costs)	No further rental of company land; Communal rental market well established	Attempt to create contract-farming system;	Market for rice well established; Higher prices for produce (even low quality); Side-selling

4.5 Limitations and discussion of findings

4.5.1 Limitations and further research need

The analysis in this chapter was based on triangulation of primary quantitative and qualitative data. The focus was on five interlinked characteristics of the rural institutional setting in close proximity to the LSLA in eastern Uganda. While the analysis of interviews and cross-sectional survey data sheds light on the evolution of the rice sector, the establishment of property rights over wetlands, the organisational changes of the LSAI and surrounding smallholder production of rice, and the value of wetlands; a number or limitations apply. Establishing statistically robust arguments about causal relationships or attributing the magnitude of impacts to certain parameters was not possible due to the lack of data and resources to gather appropriate data. In addition, there remains a limitation of qualitative methods: both interviewees and interviewers might introduce biases into the narratives, which I could not entirely control for, especially due to the fact that I had to rely on translators. Throughout the fieldwork strong emphasis was placed on training assistants to remain neutral and avoid suggestive questions. Furthermore, I triangulated information obtained from interviews. Conceptually, I limited the scope of the Uganda case study to five main dimensions. Further research could explore some of the aspects little explored here, such who has been more willing to venture into rice initially and who are the current adopters, inventors, etc. As in the earlier chapter, full economic valuation of the ecosystem services provided by the wetlands was not considered in this analysis.[281]

4.5.2 Discussion of findings

As the case of Tilda has shown, LSAIs have substantial impacts on institutional settings in surrounding rural economies (Figure 4.15). I could show how technology induced institutional change strongly contributed to the establishment of individual property rights over wetlands. Rice growing made wetlands valuable assets that community members wanted to establish their 'right' over (i.e. authority over it). This followed the pre-existing *de facto* rule that attributed proprietorship to those whose land stretched to the borders of the wetlands. Demarcation was traditionally accomplished using trees, canals, or streams. Land rights are not challenged and are transferable.

In addition, the emergence of a large company introduced technological change. A combination of compelling and incentivising factors motivated farmers to venture into growing this new cash crop. For the first farmers to adopt rice cultivation, experience at the farm was key, while those

[281] Since the RAMSAR report (1971) a number of authors and publications have identified the high environmental value of wetlands.

who adopted rice cultivation later learned those skills from their peers. The narratives suggest that younger and economically better off farmers tended to adopt rice cultivation first, which is consistent with the findings of others (Admassie & Ayele, 2011).

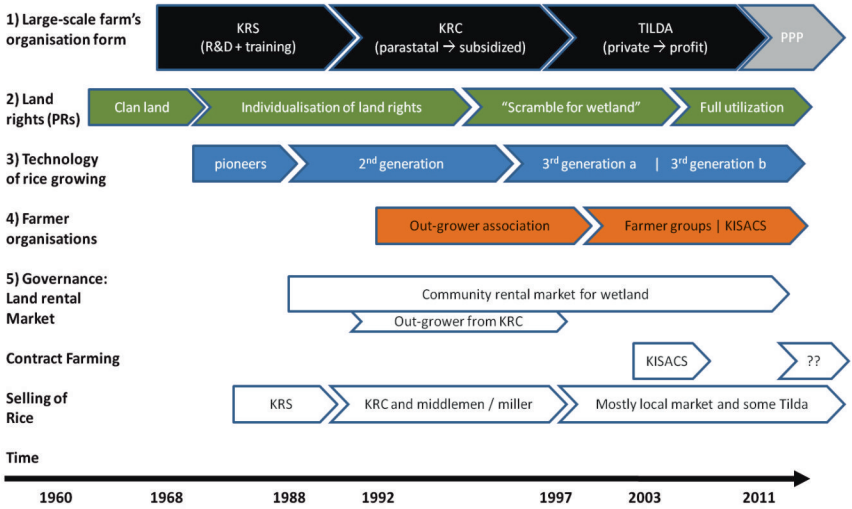
While conversion of wetlands for agriculture can be observed all over Uganda (GoU, 2010), in the vicinity of the LSLA *all* wetlands have been converted since the early 2000s (GoU, 2007). As in the rest of the country, this has been partially driven by population pressure, but in Bugiri the additional factor of rice production as a locally profitable cash crop contributed to this trend. Thus, the new technology (crop) introduced by the LSAI had a significant impact on land-use and the development of individual property rights over formerly communal land. The spread of rice cultivation in Uganda was further catalysed by the organisational re-structuring at the LSAI and subsequent layoffs.

The greatest institutional innovation, at least partly attributable to the investment activity, has been the emergence of a vigorous land rental market that is consistent with pre-existing customary land titles whose transfer (lease) is mainly governed by informal arrangements.[282] Since 1995 these customary titles are also protected by the Constitution of Uganda, which provides that "*all land is owned by the people of Uganda*", as to be distinguished from ownership by the Ugandan State (Bomuhangi et al., 2011; GoU, 1995). This community level exchange of rights over valuable assets for a period of time has coexisted with more formal land transactions (dual markets) at two points in time: (i) under state management of the KRC when out-growers leased land from the company, and (ii) since privatisation Tilda rents land from the local council (LC3). Both prices are below the community market value, although for Tilda no precise figures were provided by the management. This indicates that land markets are skewed, even though subsidy prices could be justified on the basis of the potential for positive spill-over effects. Further research should explore the broader ramifications and externalities to develop a framework to determine optimal rental prices that governments should require users to pay.

A number of organisational innovations and adaptations in governance structure have occurred over the history of the LSLA. Organisational change of farmer groups is mostly attributed to agency (foremen/block leaders and former working colleagues), while the institutional changes at the LSLA might have been more driven by technological change and restructuring of the global food system (Fritz & Schiefer, 2009; von Braun & Mengistu, 2009). In addition, changes in the labour market—the shift away from permanent contracts to sub-contracting through independent foremen and out-grower agreements—reflected this.

[282] Because of their potential efficiency, land rental markets are also promoted by some of the land tenure rights NGOs in Uganda (LEMU, 2009).

Figure 4.15 Chronological sequence of change across the five analytical dimensions in the Bugiri district, Uganda



Note: This figure depicts the conceptual framework of the research presented in this chapter. It is related to Williamson's layered approach (2000). The property right channel is in the second layer, the other four channels are located on the third layer, where contracting and adaptation are the main interest.

The livelihood strategies and poverty levels in the Bugiri district have changed drastically over the past five decades. Some of this change can be attributed to the emergence and evolution of the large-scale rice scheme in the area. Today, rice growing is very popular in Bugiri: 87% of the farmers interviewed stated that they would recommend their children to start/continue rice farming.

Despite the fact that already a third generation is currently cultivating rice in Bugiri, giving an indication of the vast local knowledge on the crop, additional training could have important poverty alleviation impacts. As the findings of recent studies by a number of rice experts have shown, training for Ugandan farmers in similar settings in more efficient use of inputs and appropriate planting technologies can result in increased output/input ratios, productivity, and profitability (Kijima et al., 2012; Miyamoto et al., 2012):

> *"Particular emphasis is placed on the role of technology to induce institutional and market change, as was evident in Asia's Green Revolution. Altogether, the studies in the book suggest that, in addition to improving markets and the output/input price*

ratio, it is essential to improve technology (e.g. varieties or water management) so that fertilizer and other inputs can earn a higher return"
(Yamano et al., 2011; p.iv).

Still, the current relationships between the LSAI and local rice growers in Bugiri are not favourable to the transfer of technology. Public-private sector dynamics since the privatization of the state-farm and resulting orientation on profit have weakened relationships with the local communities and at one point led to violent conflicts between workers and the company (Bikala, 2010). Mutual trust eroded, leading to a situation with a higher risk of moral hazard that causes Tilda to increase security measures over the properties (e.g. night watchmen), and reliance on hierarchical structures, as market solutions (such as out-growing arrangements) fail to sustain mutual gains. It remains to be seen whether current efforts by the company's management to expand operations by acquiring another 10,000 ha will fulfil the expected economic (operation at full capacity --> economies of scale) and social benefits (additional employment and income opportunities). In contrast to the claims of the FAO (Arias, et al., 2012), I found that Tilda has contributed little to the expansion of rice cultivation in Bugiri over the late 1990s and 2000s. Rather the favourable institutional setting, price development, and sufficient 'digestion' of the knowledge needed to grow a new cash crop contributed to the sharp increase in rice production. The 'seed information' had been planted by Tilda's predecessors KRS and KRC. Nevertheless, Tilda remains an import actor in the livelihoods of local small-scale rice producers. Farmers can purchase inputs, acquire necessary funds through wage employment and sell their harvest.

5 SYNTHESIS OF CASE STUDIES AND CONCLUDING REMARKS

In the following I briefly review the steps taken in this research to arrive at the evidence presented in the preceding chapters, followed by a discussion of limitations and further research needs. This will feed into a synthesis of the findings of the case studies presented and place these in a broader context and present potential policy implications.

5.1 Analytical approach and its limitations

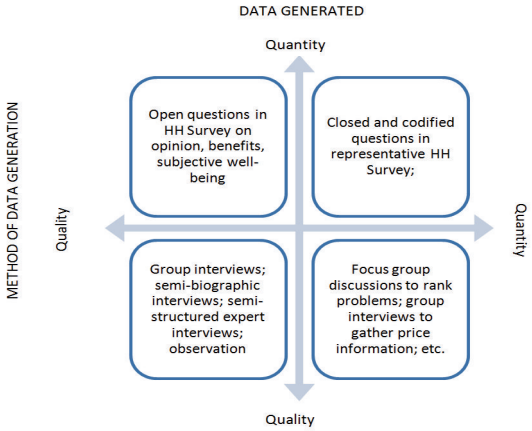
5.1.1 Methodological pluralism

> *"While verifying the empirical warrantability of precise prediction has been the guiding standard for much of the work in political economy, we may have to be satisfied with an understanding of the complexity of structures and a capacity to expect a broad pattern of outcomes from a structure rather than a precise point prediction. An outcome consistent with a pattern may be the best verification we can achieve in settings of substantial complexity."*
> (E. Ostrom, 2005, p. 11)

Measuring the impacts of LSLAs is a difficult undertaking given the complexity of each case and the multi-dimensionality of the impacts on local populations. A case study approach, despite the limitations for generalizing findings, is the most appropriate for exploring multiple impacts. The combination of qualitative and quantitative methods of data generation, as well as combining ex-post and ex-ante analyses, attempt to accommodate this difficulty. Through the mixture of qualitative and quantitative data collection methods, a variety of qualitative and quantitative data have been generated. As Figure 5.1 shows, qualitative data were generated through both qualitative and quantitative methods and vice-versa. The realistic ontology of my approach acknowledges the limitations of a social scientist's capacity to identify plausible explanations rather than robust causal relationships, due to the fact that one cannot create 'laboratory conditions' where all variables are controlled for.[283] Data analysis was an iterative process. Triangulation of the qualitative and quantitative data was not merely for validation, but to further deepen and broaden understanding (Olsen, 2004).

[283] Realism argues that the nature of social objects is often affected by the way they are construed, but that they also have an ongoing real existence that is not determined entirely by how today's researchers construct them (Sayer, 2000; in Olsen 2004, p. 4).

Figure 5.1 Methods and types of data generation during field research



Source: Adapted from Rao and Woolcock (2003)

The combination of ex-ante and ex-post impact analyses added a temporal dimension to this triangulation, which will be further discussed below. The purpose of this methodological pluralism has been to understand the poverty impacts of LSLAs, which stipulated a layered approach to the social analysis. Different aspects and layers favour different techniques and thus required different data.[284] A broad range of primary data was generated and analysed to accomplish the objective of this study to understand the economic impacts of LSLA on the surrounding rural economy and its population.

5.1.2 Limitations for generalisation of findings

The study and its results hold true only with a number of limitations, which are rooted in data availability, conceptual approach, and disciplinary boundaries. Due to the lack of baseline data for the Uganda case and the early stage of the Ethiopian case, no counterfactual-based impact evaluation was possible (Hemmer, 2011). The theory-based impact evaluation relied on the broad range of primary data gathered, as secondary information was very limited. The approach focused on the impacts on the local rural economies, communities, and households within the vicinity of each agricultural investment. Apart from a short discussion in the descriptive section of the Ethiopian case, I did not look beyond the household as a unit of observation: intra-household impacts on the distribution of tasks, access to key resources, and nutrition would thus contribute to the understanding of the economic impacts of LSLAs. Similarly, the study does not

[284] A schematic overview for the dimensions of the analyses is included in the Appendix (Table 7.25).

extrapolate the potential impacts of the current wave of agricultural investments on the whole agricultural sector or national economy of a particular country. Systematic review of the existing and continuously emerging case study evidence could fill this gap in the future.[285]

Finally, the case study approach limits the ability to generalize about the findings, which are partly restricted to context specific characteristics. The crop studied here (rice) implies certain technological and business model opportunities and challenges, which differ largely from other industrial crops (e.g. oil palm or sugar). For one reason or another, the two cases investigated might be more positive regarding their impacts on poverty reduction than the average LSLA. This is partly due to my selection of pre-existing cases, partly due to the fact that the Uganda case has been an older scheme, and in Ethiopia the investor—though foreign on paper—has strong linkages to the country and perceives the project beyond its business scope as a reputational issue that he will not allow to fail too easily.[286]

5.2 Discussion of findings

5.2.1 Types and trends of LSLAs in East Africa

The figures and trends regarding LSLAs stated in media reports were not verified, but a more diverse trend with many local investors and generally slow progress in developing acquired land was documented. Investment activities in Ethiopia increased sharply. Demand for farmland has risen since 2003 and especially after 2007, peaking in 2008 with a total annual demand for agricultural land surpassing one million hectares. This demand, however, is only partially met by national and regional supply through the government, which showed a more conservative practice in issuing leases than media reports suggested. In Uganda where a private market for land exists, media recorded deals were *not* confirmed in most cases. The majority of LSLAs in both countries had a domestic actor involved. Foreign investors mainly come from Europe, Saudi Arabia, India, and North America. In Uganda, formerly domestic agricultural production companies became internationalized. It remains unclear what drove this process. Potential explanations include that capital flows into Africa acquired shares of established companies, or that well performing actors in the national market started to seek opportunities abroad, or moved company equity to tax havens to avoid expropriation and taxes.

[285] Tyler and Dixie (2013) are an interesting first attempt to use existing longitudinal data to describe the survival rate of LSAIs. Kappel et al. (2012) make a first, thought simplistic, attempt to simulate impacts on global cereal prices. Their analysis neglects the costs for conversion of land and assumes production after a relatively short period and at full scale—both seem unrealistic assumptions.

[286] See also further discussion on the case specifics in Section 2.4.4.

5.2.2 Impacts on rural economies and local livelihoods

(a) Impacts on land, labour, and natural resources

Following the inception of the LSLAs, a substantial change in the relative value (shadow prices) of the production factors (land, labour and natural resources) were observed in both case studies. This partly stimulated a re-arrangement of governance systems over these factors (e.g. new hiring structures at the farm).

Access to and the value of land are key factors affecting rural production and consequently the well-being of a rural household and its members. In the Uganda case land scarcity, especially of the lowlands suitable for rice cultivation, has led to a significant valuation of wetlands. On the other hand, in the land-abundant setting of Gambela the value of agricultural land was *not* affected by the emergence of a large investment. The agricultural land was only valuable due to the labour invested in making it accessible and productive.

In scarcely populated Gambela wage levels increased after the arrival of the investment, and are expected to rise further in the simulated scenarios. Especially among the commercially more integrated highlander social group, labour shifted increasingly from agricultural to non-agricultural activities and the shadow price of labour grew. In addition to this increase—on average—a diversification of demand for labour according to skill level was perceived in both cases. Saudi Star data revealed at least 15 different skill profiles were in demand by the management of the large-scale farm. So far this demand is only partially met locally and has led to substantial labour migration into the area. The qualification requirements are a function of the production technology applied at the LSLAs. The Saudi Star case illustrates how initial plans to use labour intensive cultivation practices (line planting) were rendered economically unsustainable and replaced with mechanised cultivation and processing (e.g. rice mills instead of thrashing). In Uganda different phases of employment regimes were observed. A more hierarchically integrated system of permanent employment in the two earlier organisational forms of the effort was replaced with more market based sourcing of labour from foremen who were hired on a weekly basis. Unskilled labour was seen as an unattractive alternative to farming individually, still many households reported that they had worked on the LSAI in the past or send family members to work there in order to contribute to household income.

In Gambela the LSAI converted 10,000 ha into a commercial farm. Only about 400 ha were under production in 2013, but the local population has already lost the opportunity to use about 8,000 ha for hunting and gathering activities. Predictions of the mathematical model clearly showed the high (seasonal) value of bushland and forest to the local population. Especially the poorer and less integrated social group continues to rely on natural resources even as the off-

farm employment opportunities and the RNFE grew. The model simulations predicted a decrease in natural resource use as agricultural activities become more productive and profitable, but this linkage might need to be further explored. The food security function of edible roots and wild fruits as well as the importance of medical plants will continue to be important for these rural populations even after agricultural productivity increases. In Bugiri natural resources are under high anthropogenic pressure. The introduction of the new crop that triggered the conversion of most of the wetlands in the district clearly contributed to this. Brick production using wetland soils, an increasingly profitable business venture in times of rising incomes and investments in housing, further adds to the stress on the limited resource base. The water use by different production techniques was not part of this study, but should be further explored as it will largely have an impact on livelihoods over the mid- and long-term.[287]

(b) Innovations: organisational and technological change

The second group of changes can be understood as 'innovations' that change local production systems. These innovations can be technological or organisational in nature. Often they are imposed by higher order institutions or emerge spontaneously in response to needs or opportunities. The early phase of the Ethiopian case allows little opportunity for observing these changes, which would have occurred at the layer of governance (L3) in the framework for social analysis (Williamson, 2000). Probably the greatest observable change in the Abobo rural economy has been the emergence of increasing amounts of small and medium sized businesses. They reflect a structural change of the rural economy, rather than confined organisational innovations or technological change. Membership in organisations was low in the Ethiopian context, as economic benefits from organising production might not outweigh the costs of organising.[288] The Bugiri context, where the LSLA had affected local production and resource allocation over the past four decades, revealed a number of local innovations. The adoption of a new crop in the area and the transformation into the 'nation's rice basket' within the period of three decades is probably the most pronounced. The adoption of rice growing was not a matter of course, but occurred first experimentally and later at a larger scale due to the loss of off-farm employment.[289]

[287] Both case study LSLAs rely on surface water collected in artificial reservoirs, while locals rely on either rain water only (Ethiopia) or use simple earthen walls to channel streams to their paddy fields (Uganda). Today, competition is probably greatest for the use of the lakes where locals fish, which Tilda already forbids and Saudi Star does not recognize as legitimate use (but tolerates it to some degree, fencing only off the area where the water enters their canal).

[288] Funeral groups were the only significant organisational group among the highlanders, while a smaller share of Anyuak participated in group-saving.

[289] Note that in 2011 about one-third of the seeds used for rice production were either improved new varieties from the most recent management (27%) or the original seeds from the rice development

Organisational innovation, especially the emergence of farmer groups in Bugiri, could be partly attributed to (changes in the organisational structure of) the LSAI. These groups, whose members tend to include the wealthier local farmers, allowed access to technological innovation, credit, and saving. During the KRC period the Kibimba saving group collectively leased 400 ha from the large farm and cultivated it through out-grower arrangements. This group even facilitated tractor rental services to other farmers and cultivated rice paddies to supply the LSAI's mill. The success of this group seems to be partly explained by the companies' commitment and support (e.g. the leader was paid by the company). Detailed information on the financial profitability of this mutual agreement is lacking, but given the low utility rate of today's rice plant in Bugiri and the difficulties faced by the Saudi investor to develop production on the large area suggest that there is potential for similar initiatives. The collapse of the out-grower scheme initiated by Tilda in the early 2000s, however, illustrates the difficulty in reaching mutually beneficial terms through contract farming arrangements for food crops where a local market with good product prices exists. As a consequence, side-selling is an attractive opportunity for farmers.

(c) Impact on institutional environment: change in 'rules of the game'

The last set of effects relate to the institutional environment within which each of the LSAIs occur and the changes in 'playing of the game' within this 'arena' (E. Ostrom 2005). Thus I link the institutional change with the local practices that enforce these institutions, or fail to do so.[290] *Property rights* to the land used by individual households are the first dimension of concern in much of the literature surrounding 'land grabs.' Rules and regulations regarding the LSLAs (re)define rights over the land allocated. It is noteworthy that in neither of the two cases had individual rights to land been neglected. At the time of the LSAIs' inception local institutions were strong enough to protect household land rights. It is likely that not enough land had been previously converted into agricultural use to create local scarcity and thus competition was (still) low. In the Ethiopian case no compensation for the loss of access to communal land was paid since the government perceived the property as state land and did not perceive any need to compensate local (illegal?/legitimate?) users for forgone income or livelihood opportunities. In Uganda, consistent with customary land ownership practices, rights to land were maintained

scheme (6%). The remainder were local variations that were partly developed by crossbreeding and partly introduced by governments or donors. Still in 2011, most rice farmers in Bugiri relied on their own seeds rather than purchasing higher quality inputs.

One of the senior farm managers in Ethiopia bred a local variety of rice by crossing the high-yield basmati variety with local grasses. Such innovation can bring about substantial gains for local populations, but requires mechanisms to distribute them to local producers.

290 This indicates that form and functionality of institutions are to be distinguished (Chang, 2010), and that enforcement by agents 'playing the game' largely determines functioning (North, 1990).

even until the 1990s when wetlands were increasingly converted to rice production. Traditional demarcations and local conflict mitigation proved sufficient to maintain order and protect rights, and the 1997 constitution translated these customary titles into formal property rights. However, these arrangements might be challenged by increasing pressure on land due to population growth, further expansion by the investor, and attempts by the government to extend governance over natural resources, specifically wetlands. In Ethiopia the private investor had a team of Pakistani-Ethiopian specialists surveying land, putting boundary stones, as well as producing detailed maps to physically and legally demark the farm property.

In both cases the land leases include significant parts of local watersheds, thus extending over the directly productive agricultural land into the water sources needed for irrigation. While lease payments for land were due annually, water rights were obtained free of charge and, at least initially, without restrictions. This supports early conclusions that LSLAs always imply—often implicitly rather than explicitly—the acquisition of water rights (Benjaminsen & Lund, 2002; Smaller & Mann, 2009; von Braun & Meinzen-Dick, 2009; Sojamo et al., 2012).

Enforcement of contractual arrangements and monitoring of lease agreements remain as challenges for governments in both cases. At the regional administration levels the capacity to monitor and evaluate the LSLA's activities are insufficient. The responsible civil servant in Bugiri's local council (LC3) where the land lease payments should be collected conceded that he did not have detailed information on the proportion of area under cultivation versus non-productive land and thus he relied on company provided information regarding the calculation of the lease payments. Similarly, the regional administration in Gambela Town responsible for monitoring environmental and social safeguards lacked funding for vehicles and fuel to visit the site and thus relied on reports provided by the company. At the national levels monitoring capacity is increasing. Ethiopia recently up-graded the directorate responsible for LSLAs into an Agricultural Investment Land Administration Agency (Ministry of Agriculture, 2013). In addition, a moratorium on land deals for about 10 months between April and December 2012 allowed the government to validate implementation progress of investors on the ground. As a consequence Ethiopia withdrew the licenses of a number of investors and is currently considering how to re-allocate the land.[291]

Probably the biggest institutional change has been the emergence of a land rental market for wetlands in Bugiri. This technology induced institutional change brought about significant improvements in the allocation of a scarce resource (wetlands) and the brisk activity suggests

[291] The most prominent case has been the decision to cancel the lease contract with the Indian investor Karaturi over 300 000 ha of land in Gambela, announced in August 2013. In consequence, Karaturi is selling its equipment locally in Gambela in spring 2014.

mutual benefits for both tenants and landlords. In both countries the land market remained a dual market: the local populations operate under both informal and formal arrangements, while the government maintains the unilateral right to lease land to the foreign investors. The determination of prices for the public-private rental agreements is a function of political calculus rather than local valuation of the resource. This is not necessarily negative and can reflect policy priorities, but there is little transparency in these proceedings. The Ethiopian federal government addressed this issue in 2010 with the launch of a revised rental price form and renegotiated existing deals accordingly. In Uganda the process remains a combination of private market transactions and political influence over large transactions.[292]

5.2.3 Impacts on poverty: level effect and growth effect

The above discussion on impact channels helps distinguish between the two types of effects a LSLA/LSAI can have on rural economies and thus the local population's economic status. The first I call a *level effect*, underlying the fact that the re-allocation of land and re-valuation of production factors within rural economies triggers positive or negative impacts on local production overall, comparable to a shock. This shock can either improve the situation of local populations (e.g. a valuation of labour and increasing wage rates, which provides a direct return to all households that are net-labour-supplier) or deteriorate the livelihoods of household members (e.g. by depriving them of access to previously used range land or increasing the factor prices for net-consumers of these factors).

The second effect I refer to as *growth effect*, which indicates that the efficiency of production factor use increases, either through technological or institutional innovations (e.g. new crops are introduced or new forms of organisation allow farmers to pool resources and assess value-adding activities, etc.). Graphically, the level effect can be conceptualised as a horizontal push upwards (positive) or downwards (negative) of the mean per capita income. The growth effect can be conceptualised as a twist in the 'slope' of its change over time. Theoretically, four combinations of these effects are possible (Figure 5.2):

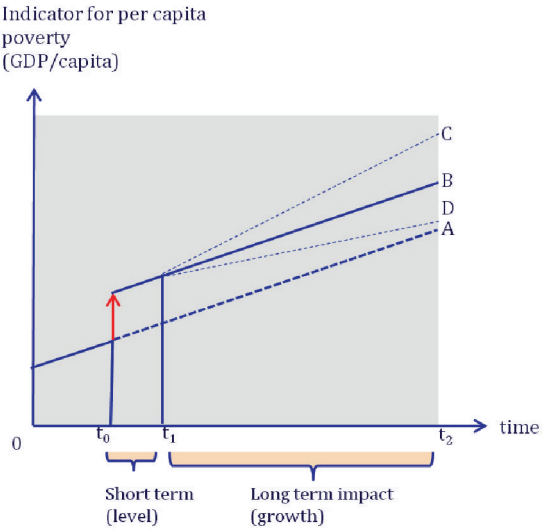
[292] The Palm Oil Development Project on the Kalangala islands is a good illustration. In the first phase the government built a task force comprised of representatives from several ministries to consolidate sufficient land for the nucleus plantation measuring 6,500 ha (see Figure 7.18 in Appendix 7.5). In the second phase, which intends to replicate the Kalangala model on another island closer to Kampala and Jinja (Buwuna), the political support is weaker and since locals anticipated rising land prices the extension currently seems prohibitively expensive.

Figure 5.2 **Typology according to impact on poverty, disaggregated by growth and level effect**

Level effect \ Growth effect	Negative	Positive
Positive	+ –	+ +
Negative	– –	– +

In a general manner this is depicted in the following stylized graph (Figure 5.3). Initially the local population lives at a certain GDP/capita (or other economic indicator). I assume that there is a slightly upward sloping trend over time, which would result in point A without investment activity. As discussed earlier, LSLAs can be conceptualized as shocks to the rural economy that change the absolute and relative values of production factors. Assuming net-appreciation, this shock triggers a positive level effect (e.g. through employment generation), which translates into more income for rural households that supply labour. With the same growth trajectory as before point B would be reached. If growth rates augment/decrease the points C/D will be reached instead. It is also possible that the net level effect (red arrow) is negative (e.g. if loss of access to previously used land is not off-set by employment generation).

Figure 5.3 **Schematic presentation of the level effect and growth effect**



I argue that the level effect is mainly caused by the net valuation of production factors used by the LSAIs. Thereby the valuation depends on demand and supply, relative scarcity, and substitution(ability) (technology). The local population can seize the opportunity of this appreciation if—and only if—they are in control over these production factors and have

enforceable rights to the returns from these factors. This clearly holds true for labour, which is assumed to be 'free' in most contexts (Binswanger & Rosenzweig, 1984; Kay, 2009; Murray Li, 2011). For land and especially collectively owned resources, ensuring rights over returns becomes more difficult. For example, a community member can only gain from appreciation of the value of local communal land if his access and user rights are recognized and he has the right to decide whether or not to rent the land out. The growth effect (slope of the curve) is a function of technology, institutions, and aspiration—such as how productively the factors are used and how the generated benefits are shared with the local population.

Using this line of reasoning, the following two stylized figures represent the growth and level effects throughout the evolution of the Uganda and Ethiopian cases (Figure 5.4 and Figure 5.5). For the Uganda case it is interesting to highlight how technological change came about after the first negative shock in the 1980s, leading to a sharp increase in income for the local population, especially of those who were growing rice (1988–97). After privatization (1997) and under the current business model of the LSAI, the income growth rate for the local population stabilised again. However, institutional (land rental market) and organisational innovations (farmer groups, processors) contributed to greater independence from the company's development for many households.

Figure 5.4 **Stylized mean per capita economic trend for the Tilda case study, Uganda**

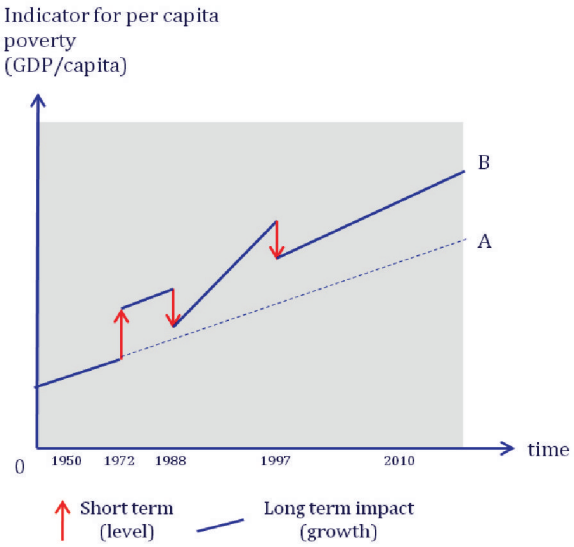
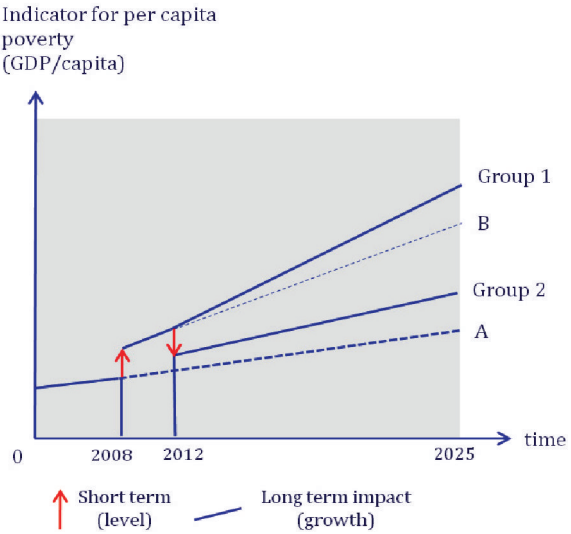


Figure 5.5 **Stylized mean per capita economic trend for the Saudi Star case study, Ethiopia**



In the Ethiopian case the valuation of labour through direct employment at the LSAI and in the growing RNFE increased incomes for the local population through additional employment and rising wage levels (2008). If this trend would have continued a higher GDP/capita (point B) might have been reached after 10–15 additional years. After the violent conflict in 2012 members of the indigenous group were increasingly laid off from work at the farm or were forced to leave, leading to a greater divergence in the growth trajectories of the two groups. While the net effect for both groups seems to be still positive the investment runs the risk of exacerbating inequality between these groups (horizontal inequality, Stewart, 2001).

These findings can be applied to the analytical framework, grouping the documented impacts of a LSAI into the layers of social analysis (Figure 1.8). The fifth group of impact channels, institutional change, is documented as cross-cutting in L2. Thereby I combine the conceptual framework of five channels (Figure 1.6) with the analytical approach of four layers to present the study's results

Table 5.1 Impacts of LSAIs along five main channels across four dimensions, as found in the two casestudies

	Level of social analysis	Land	Labour	Natural resources	Technology & organisation	
L1	Embeddedness: informal institutions, customs, traditions, norms, religion	Ownership of wetlands in Bugiri	–	–	–	
L2	Institutional environment: formal rules of the game—esp. property (polity, judiciary, bureaucracy)	Land markets (U); Land regulation (U, E)	Labour market (E);	Formal demar-cations & titles (E,U)	Market for rice (U)	Get the institutional environment right: 1st order economizing
L3	Governance: play of the game—esp. contract (aligning governance structures with transactions)	Land rental (U); Contract farming (U);	Employment regimes (U, E); Migrant labour (E)	–	Rice miller & trader (U); Farmer groups (U); SMEs (E)	Get the governance structures right: 2nd order economizing
L4	Resource allocation and employment (prices and quantities; incentive alignment)	Land price (U); Wetland use (U); Less land use (E*)	Wage increase (E, E*, U); Off-farm employment (E,U,E*)	Access to forest (E); Wetland (U); Water/lake (E,U);	Rice seeds & output sales (U);	Get the marginal conditions right: 3rd order economizing

Theoretical approach
L1: social theory
L2: economics of property rights
L3: transactions costs economics
L4: neoclassical economics/agency theory

Analytical approach
L1: deduction
L2: deduction-induction
L3: deduction- induction
L4: induction (deduction)

Note: (U)—Uganda case study; (E)—Ethiopia case study; (E*)—simulation of Ethiopian case study.

5.3 Contextualising these findings

So what?!—This study has found a sharp increase in the amount of land involved in international transactions globally, as well as a growing number of LSAIs in both countries, and

this was further supported by other studies and secondary data (e.g. Schoneveld, 2014; German et al., 2013). In addition, the meso-level analysis revealed significant impacts on rural economies and potential for poverty reduction, but left a number of aspects for discussion, including governance of deals and policy recommendations. To contextualise the findings of the study, I narrow the focus and select three aspects of pertinent importance to connect them with broader global trends and discussions: (i) globalized agri-food systems, (ii) optimal farm size and its relation to land and labour markets, and (iii) the organisational form of large-scale production units.

In a nutshell the observed positive LSLAs trend is driven by—among other drivers that mostly continue to exist—a change in the global agri-food system and the economic logic of its actors' efforts to internalize production risks. The trend has received much political and media attention, since many transactions exceeded prior land-based FDI in scale and the total amount of land involved. The large size of parcels involved in many of these deals is a characteristic that is partly a reaction to malfunctioning land and labour markets. Investors wanted to internalize these production factors in large-scale farms. For both the sustainability and pro-poor impacts of these enterprises, improved functionality of local land and labour markets are recommendable, including safeguards against exploitation and expropriation. Finally, the very unit of observation—the LSLA or LSAI—does not have a standardized structure: they differ significantly in their organisational form, internal governance structure, and contractual arrangements, which link them with the surrounding economies.

5.3.1 Increasing globalization of the agri-food system and the economic logic of agribusinesses

> *"The globalization of the agrifood system can be broadly defined as the integration of the production and processing of agriculture and food items across national borders through markets, standardizations, regulations, and technologies."*
> (von Braun & Mengistu, 2009, p. 172)

The documented wave of interest in acquiring farmland abroad was triggered by the global food price crisis of 2006–07. Since then commodity prices have remained high. While this trend appears to be slowing down in Ethiopia and Uganda, international investments in agricultural production are likely to continue. Some of the drivers of the food price spike continue to exist: First, the demand for biofuel, which contributed to the price increase,[293] is likely to remain high or even increase. Second, as commodity prices remain high investment in production to reduce

[293] This effect was especially pronounced due to the diversion of the US maize crop for ethanol production (Headey & Fan, 2008).

the price volatility of supply will continue to be attractive to agribusiness.[294] Third, carbon markets play an increasing role; 'cheap' land in Africa will remain attractive for investments in tree plantations or conservation measures. Fourth, urbanisation expansion and growing urban populations will depend on imported food. Fifth, expectations regarding future commodity prices remain positive, causing continuous interest in agricultural production. Seventh, new innovative use of agricultural products shall increase demand in the medium term (bioeconomy). Finally, climate change and volatility are affecting agricultural production (Mirzabaev, 2013) and might cause agribusinesses and food producers to seek new investment opportunities abroad.

But market forces are not the only factors driving this process, public policy in investor countries such as the Saudi Agriculture Investment Abroad Initiative or China's 'Going Global' policy favour investments. In Europe the promotion of renewable energy has stimulated investment in biofuel production or the diversion of sugar for energy generation. Policy in recipient countries increasingly invites investment.[295] Agricultural sector strategies since the late 1990s and 2000s often favour market-driven development that also seeks foreign and domestic investment at large scales (e.g. MAAIF, 2010). Both case study countries, Ethiopia and Uganda, have established investment policies that are favourable to investments that are either capital intensive or likely to bring about technological change.

As shown above, demand for agricultural products is high and likely to remain so for the coming years (expectations). Thus, globally active agribusinesses will continue to seek increasing control/governance over production to assure a timely supply of high quality produce in large quantities. LSLAs have been one reaction to the global food price crisis, but exhibit mixed success. Hence, large agro-processors are also increasingly looking for opportunities to source from small producers, but due to the strict requirements of the globalized food system and the lack of national investment in infrastructure and access to inputs, transaction costs for sourcing from multiple small producers remain prohibitively high in many cases.

"A lack of appropriate policy and physical infrastructure tends to favour large-scale over small-scale farming by raising the cost of procuring produce from multiple

[294] Over the past decades, greater returns could be generated from the processing and distribution of food products and highest risks were at the production level of the supply chain. This incentivized investments at the high end of the supply chain rather than the production stage (Selby, 2009). Additionally, greater flexibility in supply chains facilitates responsiveness to fluctuating commodity prices: renegotiating or even terminating contractual relationships is easier than divesting land ownership (Tiffen & Mortimore, 1990). However, since commodity prices remain high and volatile the risk shifts downwards and makes investing in primary production more attractive (vertical integration).

[295] The invitation by the Mozambican government to Japanese and Brazilian counterparts to participate in a regional development strategy is another illustration of this trend.

scattered smallholdings, and increases the likelihood that investors will prefer in-house production on land that they own or lease themselves."
(Vorley, Cotula, & Chan, 2012, p. 6)

Government should take advantage of this interest to pair development of smallholder *and* large-scale agriculture as well as agricultural processing. The revenue generated from LSAIs could be invested in local infrastructure development. In addition, tax incentives could motivate these investors to source from local smallholders and train local staff in order to improve benefit sharing and sustain long-term growth. In some cases, large farms could cover maintenance and operational costs of semi-public goods, such as secondary roads or market facilities in exchange of supportive measures/preferential treatment (PPPs).

5.3.2 'Optimal' farm size in the 21st century depends on functioning land and labour markets

Following the surge of large-scale land investments the debate in favour and against large-scale production has gained renewed interest (e.g. Collier, 2008; Hazell et. al, 2010; Collier and Venables 2012).[296] Various authors have discussed the 'optimal' farm size for economically efficient crop production over the short- and long-term. Today most farms are small**.** Globally more than 70% of the agricultural holdings are smaller than 1 ha, and 97% are smaller than 10 ha (HLPE, 2013).[297] For many of these smallholders as well as for policy makers, the question remains on how to move forward:

"The big transformation challenge: grow or diversify or exit"
(von Braun, 2006, p. 6).

As during the first half of the last century, Schultz's (1965) study on 'transforming traditional agriculture' argued persuasively that small-scale family operated farms are not only more efficient producers, but also respond better to new markets and technologies. The successful Green Revolution in Asia added convincing evidence for the second half of the century as several millions of small-scale farmers successfully adopted new technologies,[298] improved productivity,

[296] Noteworthy that Collier's view on the role of large-scale production changed across the four years between these two publication. In face of slow progress of many large pioneers and given the substantial fraction of speculators that have not yet developed land, he underlines importance to pick the right investor type (Collier and Venables 2012).

[297] While there is considerable variation across the globe, the relevant statistics for Africa show a similar pattern (See Figure 7.17 in the Appendix for further details).

[298] Several authors further emphasized the pro-poor nature of small-scale farm productivity growth. Mellor (1976) analysed and convincingly presented findings of how farm-level productivity gains of small scale farmers had very positive impacts on other socio-economic indicators, as well as on overall economic growth, employment generation, and poverty reduction. The discussion is featured in a

and rose out of poverty.[299] Growth helped, but cannot explain the whole story. It is farm GDP on which the dollar-poor mainly depend (Lipton, 2009). The increases in farm GDP, however, were not able to keep pace with demographic development (except in East Asia) and declining product prices, so other aspects played a key role: (i) employment-creating technology in agricultural production and (ii) land reform and relatively equitable land distribution (Lipton, 2009). Both aspects relate to the discussion about the optimal farm-size and thus are linked to controversy about whether politicians should promote large-scale production (Collier, 2008) or invest more over the long-term in smallholders (Hazell, Poulton, Wiggins, & Dorward, 2010). As findings from both country cases show, the size debate is not to be detached from the functioning of surrounding markets, especially for production factors such as land, labour and credit.[300] The large-scale units can partly internalize functions these markets would otherwise need to fulfil (Coase, 1937). However, governments should not assume that by favouring large-scale production, these markets emerge naturally and/or function better.[301] Similarly, the pro-poor outcomes of large-scale commercialized production depend on functional safeguards in surrounding markets. The economic productivity debate is strongly linked to poverty reduction and the need to protect these weakest segments of the rural population because the very poor are particularly dependent on wage labour income and access to private or communal land to meet their needs and to act as an alternative livelihood support mechanism in times of hardship.

(a) Labour market supporting policies: the skills and condition of employment matter

Much of the poverty-reduction impacts documented in the two case studies above occurred through employment generation and stimulation of the rural non-farm economy (RNFE), which increased opportunities for small businesses, service providers, and self-employment. The growing number of shops in Abobo, Ethiopia, as well as the emerging rice value chain businesses in Bugiri district, Uganda, illustrate this. For the employment creation and opportunities to earn quick cash as manual labourer at the large estates, labour conditions matter.

Labour intensity, depends on farm-size, the crop planted, the technology applied, as well as the farm management. The same crop can be cultivated labour-intensive output-intensive or with

special 2010 issue of *World Development* on 'The Future of the Small Farms' and the recent focus of the report from the 'High Level Panel of Experts on Food Security and Nutrition' (HLPE, 2013).

[299] Measured at the 'dollar poverty line' of living with less than US$1.25 a day. In 1980, one-half of the people in the developing world were dollar-poor, while in 2005 it was only one-quarter (Ravallion, 2008).

[300] The problematic situation of lacking access to credit for most rural smallholder in Africa was not analysed in this study. This aspect, and the link with larger investments, but especially the opportunity to accumulate savings from wage-employment should be further explored.

[301] As evidence from the Central American coffee sector suggests, large powerful players are more likely to counter equity enhancing and poverty reducing measures (Deininger, 2005). Evidence from plantations point in a similar direction (Hayami, 2010).

less intensity (Tiffen & Mortimore, 1990). Labour costs for plantations account for as much as 40% – 66% of the operational costs. Hence, farm managers try to use hired labour efficiently and reduce costs where possible. This might entail shifting from relying on a bigger, trained and committed workforce under permanent contract to hiring more casual labour, which is usually non-unionised and can be dismissed in off-season. The decision of Tilda Rice in Uganda to recruit labour through foreman and stop engaging directly with farm workers falls into that category. Relying increasingly on migratory labour, which is landless (at least at the location of the estate), is another strategy: these workers are easier to discipline and once brought to the LSAIs, travel costs might prevent them from returning too quickly. In this context, critics of LSLAs warn of the danger of 'rural proletarianisation', rather than de-agrarianisation or rural-urban migration (Hall, 2011; Peters, 2004). Labour market supporting policies, which address the skill gap[302] as well as protect workers from exploitative conditions are thus important to improve LSAIs' economic and social sustainability and increase their poverty reducing impact.

Experience of policy influence on plantation workers' wage in the 1980s shows, that introduction of legal mechanism, such as minimum wage levels or strengthening of unions' rights, transformed payment schemes: often a combination of timework and piecework rates allowed to reconcile the minimum wage requirements with the employer's need to link remuneration with output (Sajhau 1986, in: Tiffen and Mortimore, 1990).[303] The poverty reducing potential of these jobs should not be underestimated, as especially landless and very poor households depend on wage income to meet their livelihood needs (often also as a second income adding to self-employment on-farm). However, as recent research on small and large, as well as certified and non-certified farms in Ethiopia and Uganda showed, are these manual workers often left out of any organisational structure and thus reach exiguous benefits and regularly work below minimum wage (Cramer, Johnston, Oya, & Sender, 2014).

(b) Land tenure systems, land markets and arguments in favour of land reform

Land distribution strongly influences poverty-elasticity of agricultural growth (Hazell et al., 2010; Lipton, Eastwood, & Kirsten, 2002; Lipton, 2009). The growth effect and poverty reduction is not only bigger but also more sustainable under conditions of relatively even distribution of land (Deininger & Squire, 1998; Ravallion & Datt, 2002). It not only augments small farms' incomes and employment opportunities, but has also a big potential to reduce food prices and establish strong growth-linkages to the non-farm economy (e.g. Dercon, Gilligan,

[302] In both country cases, the shortage of skilled workforce was apparent. Saudi star in the Ethiopian case, paid substantial ‚desert allowances' to attract skilled workers from the central regions and Addis Abeba.

[303] Yet, minimum wage often meets subsistence needs only and falls behind inflation, thus workers may still suffer hardship.

Hoddinott;, & Tassew, 2006; Diao, Hazell, & Thurlow, 2010; Haggblade et al., 2010; Haggblade, 1989; von Braun, 2006).

Today, evidence from large-scale investments in Southern Africa suggests, that investors' rush has stalled or even reversed (redistributive) land reforms in the region (Hall, 2011). In a recent study on the geographical patterns of LSLAs in Sub-Saharan Africa, German et. al. (2013) document 563 deals of a size of 2.000 ha and bigger. The median size of these deals was 12,300 ha. In other words, governments made significant effort to identify, aggregate and transfer huge areas to agricultural investors. The endeavour of the Ugandan government to accumulate land for the Kalangala Island oil palm project, and the MoARD's land bank in Ethiopia illustrate this.

While in certain settings, redistributive land reform might be the only measure to help landless and ultra-poor gaining access to agricultural land, there are other measures that will have equity- and growth-enhancing effects in many contexts. Well-functioning land markets (especially rental markets) can hugely contribute to increase productivity, equity and make for poverty alleviation (Holden, Otsuka, & Place, 2012; Holden & Otsuka, 2014).

> *"The importance of land for economic growth does not reduce its relevance for poverty reduction. Even access to small plots of land can improve household welfare and act as a safety net."* (Deininger, 2005, p. 215)

In general, governance over land touches the core resource of any agrarian society: for most rural people, land accounts for more than half of their wealth. If the official mechanism to register, tax and allocate land is not trustworthy, it is difficult to maintain confidence in rule of law. Land policies directly affect the very core resource of most rural people—they are powerful and thus dangerous, if high-jacked by particular, powerful interests. Governments, thus, are not advised to start redistributive land reforms at any costs, but should consider carefully which measure might improve tenure security and the enhancement of land rental (or sales) markets (Holden & Otsuka, 2014). Ideally, the increasing interest in acquiring farmland abroad can contribute to reform rural markets for land. Promoting rental markets, because of lower entrance barriers to the poor and easier correction in case of misallocation in early phase, are to prefer over wholesale (Deininger, Ali, & Alemu, 2008; S. T. Holden, Deininger, & Ghebru, 2007).

5.3.3 Business models, organisation and contractual arrangements — a neglected dimension and space for innovation

Much of the above framing, as well as analysis with regard to LSLAs focuses on impacts and context. As the evolution and changing poverty impacts of the Ugandan example illustrates, determines the form of the LSAI how it interacts with the surrounding population. Thus,

organisational aspects of the farms, as well as the degree of organisation of the surrounding population, play a key role for the 'playing of the game' and poverty outcomes of a LSLA.

> *„Truly among man's innovations, the use of organisation to accomplish his ends is among both his greatest and his earliest."*
> (Arrow 1971, p224 – in Williamson 2000, p600)

In line with this quote, Arrow postulates the central importance of the theory of the firm. *„Any standard economic theory, not just neoclassical, starts from the existence of firms [*or farms*]. … But firms are palpably not points. They have internal structure. This internal structure must arise for some reason*" (1999, p.vii – in Williamson 2000, p602). Thus, a firm, as well as a big farm or farmer group, must be considered as a governance structure, with an internal organisation that follows economic (and/or other) logic(s). Recalling the importance of a 'shared understanding' within an organisation of its members to make each other's actions predictable (V. Olson 1971), the importance of creating shared understandings between large and small producers becomes apparent. Mutual trust, in that regard, is a key ingredient. It, at least partly, results from successful *governance over transactions*, i.e. maintaining order by mitigating conflicts and shearing benefits (Williamson 2000). This is not costless. Especially monitoring and enforcement, but also dispute settlement and benefit shearing bear monetary and non-monetary costs which the actors have to finance. So far, governance of land deals is poor, and often the strongest actor uses its bargaining power to extract maximum rents from the land acquired (Bues, 2011a, 2011b; Nolte & Voget-Kleschin, 2013; Nolte, 2013). However, inclusiveness and prevention of sharp increases in inequality are not only objectives in itself (ethically), but shall make businesses sense for the investor and be of political importance for the government: Initially higher transaction costs, will pay off later.[304] The example of increasing costs to guard the farm in Uganda against nightly theft of rice, as well as the mobilization of the national army to 'protect' Saudi Star's premises after the shooting in spring 2012 are examples of increasing transactions costs due to social unrest.[305]

Group formation can also largely benefit the poor to escape poverty. Research from Kenya shows that organised smallholder farmers gain comparatively higher incomes. But more importantly than small price advantages is adoption of innovation through efficient information flows (Fischer & Qaim, 2012). There remains however a challenge: "*Successful groups formed among the poor often exclude the even poorer*" (Thorp, Heyer, & Stewart, 2005, p. 907).

[304] Within a free market transactions move towards administrative integration if moral hazard cannot be safeguarded (see Chapter 4 - Figure 4.12).

[305] In the case of Tilda, these are internal transaction costs borne by the investor, while in Gambela the state had to cover these external transaction costs (see Eggertsson, 1996).

Nevertheless, the groups of poor play a key role through their political function to overcome marginalization and social exclusion of the poor and the poorest (ibid.).

> *„As we all should have recognized (but needed to be told), all feasible forms of organization – government included – are flawed."*
> (Williamson, 2000)

We saw a number of problems in the institutional set up of both cases. Proposing better alternatives is a difficult task and before attempting to do so, I would like to draw the reader's attention to what Williamson (2000) calls the ‚*remediabless criterion*' for organisation: *„[A] mode of organization for which no superior feasible alternative can be described and implemented […] is presumed to be efficient.*" (p601). The important aspect in this regard is *feasibility*. It is taken into account that changing organisation structures, or the institutions governing them, is not costless. For a net benefit analysis of institutional change, these costs have to be accounted for, too. At the same time, these costs are not carried uniformly, but some groups might lose out more than others, leading to supporting and resisting fractions of a certain change. Ronald Coase warns, that in some cases ‚re-allocation of property rights' is prohibitively costly (Roberts, 2012), even if efficiency arguments might favour them.[306]

There will not be one organisation solution that fits all circumstances, but more effort by policy makers and researchers should focus on the structure of a LSAIs, the contractual arrangements with workers, landowners, and the government. There are some positive examples to draw on: An oil processing company in Mali (Mali Biocarburant SA) has an organisation of local landholders as main equity holder (Verkuijl, 2012),[307] the transparent pricing mechanism of the Palm oil project on Kalangala Island, Uganda, initially design by IFAD and the World Bank, is another positive case. Donors increasingly show interest in 'brokering' public-private-partnerships and can contribute to establishing initial links and governance mechanisms (e.g.

[306] In line with this view, institutional economists sometimes refer to ‚second-best institutions', to distinguish from ‚text-book institutions' (Rodrik, 2003b). Second-best thereby acknowledges the deviation from first-best, but probably utopian, institutional design and accounts for feasibility (and to some degree pragmatism). These successful institutions often have heterodox elements, as the Botswana case where market friendly institutions were combined with heavy state intervention (Acemoglu, Johnson, & Robinson, 2003), or in Mauritius where outward export-processing and trade orientation started under heavily protected trade regime (Subramanian & Roy, 2003). Similar experience can be drawn from successful reforms efforts in India during the 1980s that lifted the country beyond its „Hindu growth rate" (DeLong, 2003), as well as for the transition of Chinese rural economy that established a household accounting system to create credible incentives without performing a total land-reform right away (Qian, 2003). The main feature that made these reforms successful has been that they focused on the key institutional constraint and did *not* attempt to reform the whole institutional setting at once.

[307] The CEO had a background in rural development an purposely set up the enterprise almost as a social-business. He is married to a local women and invests substantial time and capital to manage expectations of and relations to the local population.

IFAD, 2013).[308] Providing supporting services to surrounding farmers to enable them to meet quantity and quality requirements is often a key prerequisite for sustainable contract farming arrangements. Contract farming is no panacea, but can be a good start to link LSAIs with surrounding farmers. Still, local population could also engage in other functions, such as providing services for local value addition, processing or trade.

5.4 Summarizing remarks: 'Land grab' or 'development opportunity'?

The observed increased interest of investing in the agricultural sector, and in agricultural production globally is positive since it induces much needed capital, research and new technology in a sector that is pertinent for global food security. Also the large-scale investments in East Africa show potential for significant poverty reduction by spurring local economic growth, mainly based on employment generation, stimulation of the rural non-farm economy as well as technological and organisation change. However, these potential benefits depend on a number of factors. First of all, the context matters. Initial fears of displacement to allow for large-scale investors, while existing in some cases, seem not to be the norm. Rather, local populations are included into new social relations and might change from becoming independent producer to contract farmer or labourer (Hall, 2011). As Peluso and Lund (2011, p. 669) frame it: '*there is no one grand land grab, but a series of changing contexts, emergent processes and forces, and contestations that are producing new conditions and facilitating shifts in both de jure and de facto land control*'. Given the complexity of such structural change, capacities to govern the land deals, as well as, supporting policies targeting land tenure, land markets and supportive infrastructure, as well as dedication to growing importance of rural labour markets and rural non-farm economy become apparent. International efforts to improve governance are a first good attempt (eg. Voluntary Guidelines and RAI principles), but translating these regulations into national and local contexts, and providing resources and capacity to implement and enforce them are key. In both cases analysed in this study, capacities of local level government authorities were too weak to "control" actual enforcement of contract details (e.g. amount land cultivated, environmental and social safeguards respected, etc.). While there clearly is a development opportunity stemming from LSAIs, in view of the slow progress and difficulties to kick-start production at many estates, governments are advised to re-consider

[308] IFAD, for example, is working with a large tea producer in Rwanda, where local landholders got equity shares of the tea plantation in exchange for their land. In Indonesia, IFAD, has linked small cocoa producer in a post-conflict environment with MARS and established a currently very profitable business relation.

smallholder production with the objective to reach farm GDP growth, which has longer supporting evidence to eradicate poverty in rural areas. In addition, the organisation form of the large farm and its interaction with the surrounding rural economy importantly determine the broader development outcomes stemming from LSLAs and investments. Governments, donors, and academia should continue to explore most appropriate forms or organisation, legal structures and processes to continuously engage with the local population most affected by these structural changes. Lastly, land — agricultural as well as communally owned/used forest and rangeland — was confirmed to play a key role for the diverse livelihoods of the rural population. Since most of the very large transaction tend to involve marginal and little used land, marginalised population that frequently depends on this land (Barbier 2010; Gerber, Nkonya, von Braun 2014). Ideally, rural population is *pulled* out of agriculture and land-based livelihoods through increasing opportunities in the rural non-farm economy, with higher remuneration for their labour invested. It must be prevented that the rural poor are *pushed* of their land due to large investments. Transactions of large areas thus must not violate legitimate or legal user rights, unless compensation and/or alternative livelihood options are accessible to the affected.

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7 APPENDICES[309]

7.1 Appendix A: Introduction and Background

Table 7.1 Differences in ontology and epistemology of positivism and interpretivism

Ontology	Positivist	Interpretivist
Nature of 'being'/nature of the world	Have direct access to real world	No direct access to real world
Reality	Single external reality	No single external reality
Epistemology		
'Grounds' of knowledge/ relationship between reality and research	Possible to obtain hard, secure objective knowledge	Understood through 'perceived' knowledge
	Research focus on generalization and abstraction	Research focuses on the specific and concrete
	Thought governed by hypotheses and stated theories	Seeking to understand specific context
Methodology		
Focus of research	Concentrates on description and explanation	Concentrates on understanding and interpretation
Role of the researcher	Detached, external observer	Researchers want to experience what they are studying
	Clear distinction between reason and feeling	Allow feeling and reason to govern actions
	Aim to discover external reality rather than creating the object of study	Partially create what is studied, the meaning of phenomena
	Strive to use rational, consistent, verbal, logical approach	Use of pre-understanding is important
	Seek to maintain clear distinction between facts and value judgments	Distinction between facts and value judgments less clear
	Distinction between science and personal experience	Accept influence from both science and personal experience
Techniques used by researcher	Formalized statistical and mathematical methods predominant	Primarily non-quantitative

Source: based on Carson et al. (2001, p. p6)

[309] This Appendix is like a cellar of an old house, it contains information about the foundations of the study, other relevant interesting information as well as less relevant material which are kept there to evoke nice memories.

The study applied a theory based impact evaluation method. However, some discussion on the concepts and data requirement for counterfactual based impact evaluation (CIE) are discussed below.

Impact evaluation with counterfactual

Based on the discussion in Chapter 1, I elaborated the conditions that have to be met to qualify as counterfactual. Due to the complexity of the impact channels and the lack of baseline data, I was not able to identify or construct a meaningful counterfactual.

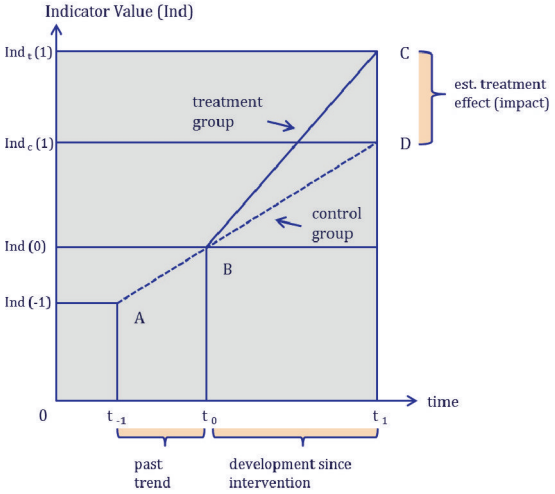
(i) The perfect counterfactual: "The most convincing way of finding a perfect counterfactual is by identifying two *identical* groups, of which one is to receive treatment (treatment group) and the other one not (perfect control group)" (Hemmer, 2011, p. 15). Two conditions are to be fulfilled in order to reach such a perfect counterfactual: **(i)** at the moment of the *implementation decision* of the intervention both groups must show the **same situation in regard to the observed out-come indicator**, and **(ii)** both groups must show the **same historical time trend** with regard to the development of that target indicator.

Such a constellation is difficult to reach. It can only be achieved if both groups share the **same characteristics regarding the aspects** considered important for the causing of the target impacts according to the underlying *theoretical model.*[310] In other words, it is not sufficient to show that both (trend and situation) are similar, but to also prove that the driver behind the change in trend have been the same. Otherwise it might be purely coincidental.

Furthermore, the decision of which group to apply a treatment to and which is the control would (i) ideally be random (to avoid selection bias) and (ii) at the latest be made when the intervention is applied (Hemmer, 2011). This underlines that the selection process is very important and must be well planned prior to the intervention. Both groups should be the same size and information must be collected about other potential factors that might affect the control group (or both) with regard to change in the target indicator. If all these conditions are met, the impact of an intervention can be measured using the 'single-difference-method'. This method measures the difference of the target indicator performance of both groups at one point in time only (Khandker, Koolwal, & Samad, 2010, p. 71). This is possible because the situation of the two groups with regard to the target indicator was the same at the moment the treatment was applied (first condition of the perfect counterfactual) any change must be attributed to the intervention.

[310] The underlying theoretical model is implicitly discussed in the conceptual framework; which was derived from the literature review of relevant theoretical and empirical work (see page 2).

Figure 7.1 **Impact identification and quantification in the case of a perfect counterfactual**



Source: adapted from Hemmer (2011, p. 16)

Data requirements for this method: As described for the perfect counterfactual constellation above, data on the impact indicators defined *ex ante* for the treatment and control group that are valid at the point in time when the evaluation takes place (end-line survey) is a must. Base-line data is not necessarily needed for the quantification of the impact (absolute change). If, however, the objective is to measure relative change, information on the situation prior to treatment is also needed (relative change/rate of change). *Baseline* data is necessary to observe whether the counterfactual is really 'perfect' (i.e. both groups have same indicator values and same historic time trend).

(ii) The quasi-perfect counterfactual: In reality it is hardly ever possible to find two identical sample populations for which the above listed criteria are fulfilled. In such a situation a comparable method is possible that is capable of producing results almost as precise as the prefect counterfactual method. This second-best option is referred to as 'quasi-perfect' as it draws on a quasi-perfect counterfactual. The 'magic key' to reach this is called **ex-ante randomisation** or **experimental evaluation design** (White, 2007).[311] This approach requires the establishment of a control group that is not absolutely identical to the treatment group, but

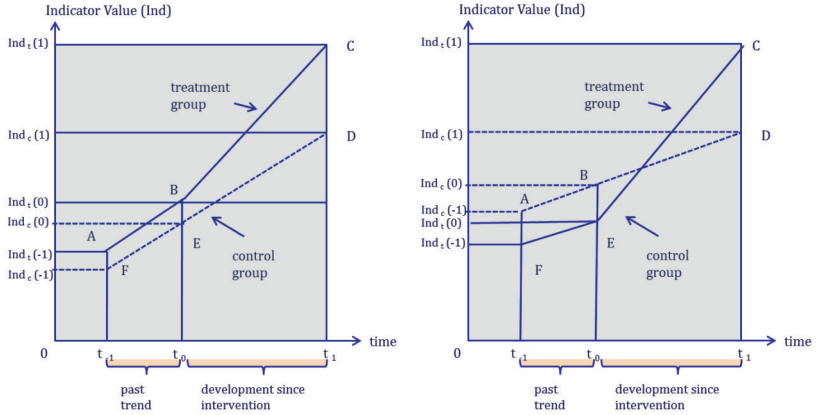
[311] Randomization can either be pure or partial. If the target population is highly heterogeneous it might be logical to stratify the population according to some criteria and then assign the treatment randomly within each chosen strata (partial randomization). Such process bears, however, the risk of inducing a selection bias into the experimental design.

that exhibits a similar temporal trend before the treatment. The result of this selection process is a *quasi-perfect control group*.

With regard to the conditions, one of the two becomes relaxed: In quasi-perfect counterfactual method it is still critical that both groups have the same historical trend with regard to the impact indicator measured. However, slight differences in the value of the indicator at the start of the intervention are allowed (Figure 7.2). Also differences in the size of the two sample populations are tolerable. There is no agreement on the magnitude of difference in the indicator value that is tolerable, but Hemmer suggests for practical reasons to accept a maximum deviation of 10% to meet the criterion 'almost identical'. He also suggests that a 10% difference in the trend is the maximum variation that can still be considered 'parallel historical trends' (Hemmer, 2011, p. 19). The necessary size of the control and treatment group depends both on the type of treatment and the number of variables considered as possible determinants, as well as the heterogeneity of the treatment group. These need to be justified on a case-by-case basis.

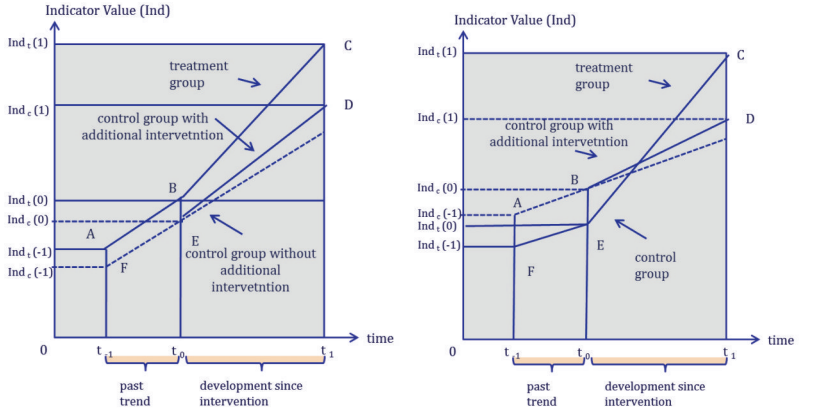
Technical procedure: *Ex-ante randomization* or *experimental evaluation design* technique is normally considered to be the most robust way to find a (quasi-perfect) counterfactual. 'Robust' means that it is resistant to various specifications and deviation from the impact assumptions derived from the ideal model of a perfect counterfactual (Hemmer, 2011). In experimental design the treatment is randomly allocated to some members of the group, while those not participating in the treatment remain as a control group. This randomized assignment process ensures that control and treatment groups are statistically almost completely equivalent, given appropriate sample sizes. This randomization effect compensates for the practical impossibility of finding two identical, carefully pre-selected sample populations (as required by the perfect counter-factual group). This minimizes potential selection biases, as the two groups are 'on average' equal.

Figure 7.2 **Impact identification and quantification without additional intervention in the case of quasi-perfect counterfactual (same historical trend, different level)**



Source: adapted from Hemmer (2011, p. 26)

Figure 7.3 **Impact identification and quantification with additional intervention in the case of a quasi-perfect counterfactual (same historical trend, different level, additional intervention)**



Source: adapted from Hemmer (2011, p. 26)

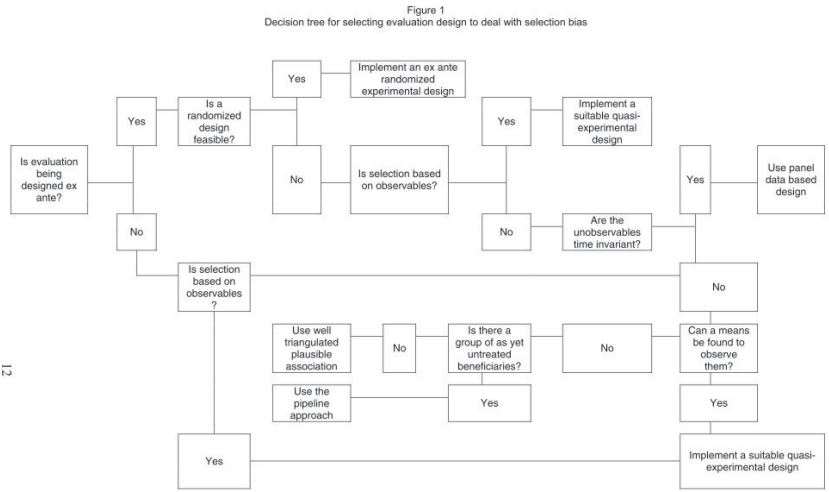
In the case of a quasi-perfect control group, the difference-in-difference method can be applied to quantify the impact. The measurements occur at two different points in time (t_0, t_1). In Figure 7.2 and Figure 7.3 and CD – BE shows the impact (Khandker et al., 2010, p. 71f).

Data requirements for this approach: In order to identify and quantify the impact at these two points in time, a baseline and an endline study are required. In the absence of an existing

baseline, secondary data might be used to construct a retrospective baseline (e.g. by using census data, etc.). Comparability of the two surveys has to be ensured.

(iii) The imperfect counterfactual: Finally, in the absence of a quasi-perfect control group there is the option to find an imperfect counterfactual using econometric techniques such as propensity scoring mechanism (PSM).

Figure 7.4 Decision tree for selecting evaluation design to deal with selection bias



Source: (White, 2007, p. 12)

Challenges during data collection: A first challenge in rural Ethiopia was to get access to a printer that could accept a USB-drive. Most of the few local internet and photocopy shops where sceptical because of the potential virus threat. Second, frequent power cuts and the lack of paper or replacement parts made printing and photocopying the questionnaires a difficult task. Once the final questionnaire was printed it the available staplers were not powerful enough to hold the 20 sheets together, requiring additional care and inventive solutions. In Uganda those things could be arranged in Kampala and have been much easier to accomplish due to the multitude of copy shops in urban areas.

Finding appropriate field assistants/enumerators was another key difficulty in Gambela, Ethiopia. The need for enumerators that could speak both local languages proved to be a significant difficulty. Initially I attempted to have equal share of female and male enumerators

but his proved impossible, as only one woman was available. In Uganda I received help from IFPRI (Todd Benson), as they had recently conducted a similar survey near the study site. It was later found out that some dialects were still different, but that language was not a problem, especially due to the fact that I hired one additional enumerator from within the communities.

Training of enumerators: Five full days of training were provided in Gambela before the enumerators were acquainted with the survey techniques (problems of bias, randomness, rules for interviewing, etc.). Following the training some changes in the wording and structure of questions and the overall questionnaire were made. In Uganda the training period was much shorter (1,5 days), as enumerators were familiar with survey work and thus the training focus was on the content and intention of the questionnaire.

The testing of the questionnaire in Ethiopia was performed in two communities corresponding to the respective two ethnic groups, which also allowed the enumerators to familiarize themselves with potential language and translation issues. Early stage testing was in a neighbourhood of the town of Gambela (in Amharic). A second test with the final draft of the questionnaire was performed in two Anyuak communities north of the town of Abobo that had similar structure to the communities in the sample. After testing the questionnaires in Ethiopia, several codes had to be adopted, some questions were changed and a few were eliminated.

7.2 Appendix B: Trends & Types

Table 7.2 Description of data sets for Ethiopian country typology

Description	Ethiopian Investment Agency full data set	Sub-set from EIA data set, including only investments 100 ha and bigger	Data collected through Prime Minister's office and regional investment offices	Data from the regional Investment authority obtained in Gambela
Abbreviation	EIA 2011a	EIA 2011b	PMRA 2011	Gam EIA 2010
# of deals recorded	10,475	2,813	1,055	197
Total Area involved	11.5 mio	11.4 mio	5.7 mio	0.4 mio
Period covered	Jan 1992 – Jan 2011		Up to Feb 2011 (not clear from when)	1992 – Aug 2010
Most reliable for	Demand side: area requested by investors		Supply side: area earmarked by government at central and regional level	Match of demand and supply: requests and supply for the case of one region
Weakness	No information on status of investment, or if even started		Most likely focus on post-2007 government efforts to identify land for investors, not sure if older investments included	Regional licenses only; does not include multiregional deals and few mega-deals processed at federal level

Note: None of the mentioned data sources is accessible online or via email. Substantial time investment was necessary to collect information, convince government officials to share information and to cross-check obtained data. Help by a local senior consultant is highly appreciated.

Table 7.3 Media reported land deals' share of total land area and agricultural land

Table 2. Land resources and land deals						
	FAO land resource data (1,000ha)			Land deals as percentage of:		
Recipient country	Land area	Agricultural area	Forest	Land area	Agricultural area	Agriculture + forest
Ethiopia	100.000	35.077	12.718	2,9	8,2	6,1
Madagascar	58.154	40.843	12.764	4,7	6,7	5,1
Sudan	237.600	136.773	66.368	1,3	2,3	1,6
Tanzania	88.580	34.200	34.433	1,9	5,0	2,5
Mali	122.019	39.619	12.372	2,0	6,1	4,6
Mozambique	78.638	48.800	19.162	13,1	21,1	15,2
Uganda	19.710	12.812	3.454	9,5	14,6	11,5
DR Congo	226.705	22.650	132.971	4,9	48,8	7,1
Nigeria	91.077	78.500	10.270	0,9	1,0	0,9
Zambia	74.339	25.589	41.562	3,0	8,8	3,3
Ghana	22.754	14.850	5.286	0,4	0,6	0,4
Malawi	9.408	4.970	3.336	3,3	6,2	3,7
Senegal	19.253	8.637	8.583	2,6	5,9	3,0

Table 2. The magnitude of the land deals as a percentage of the total land area, the agricultural area and the agricultural area plus the forest covered area in each of the 13 main recipient countries. Areas as of 2007. Source: Land resource data from FAOstat, Land resource database (FAOstat 2010).

Source: Table 2, GLP report (Friis & Reenberg, 2010, p. 13)

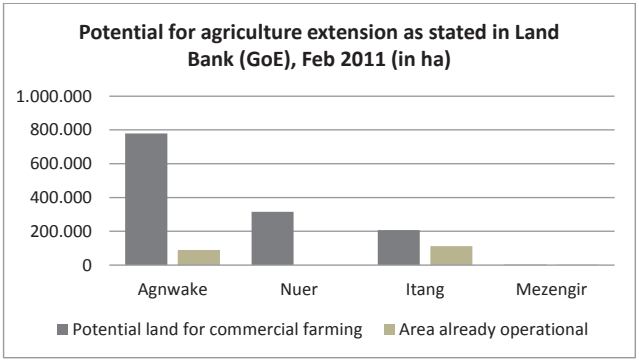
7.3 Appendix C: Ethiopia case study

7.3.1 Details of Context

Gambela Region Agricultural potential

Within the region of Gambela, the district with the most LSLA activities was chosen. Within Gambela's four zones, the potential for agricultural investments varies. Figure 7.5 indicates the different potential in each of the zones (grey bar) and how much area is already under cultivation (light bar).

Figure 7.5 Potential for agricultural investments in the Gambela region of Ethiopia (by zone)



Source: Data collected through Prime Minister's Office and EIA, 2011

Table 7.4 Cereal production under private holding and commercial farms, Ethiopia (2009/10 season)

	Grain crop area in HA	Share of total crop area	Estimated Production Qt	Share of total production
Private holdings in 2009/10 (Meher season)	11,503,249	89.72%	180,748,896	93.81%
Private holdings in Belg season	1,017,562	7.94%	6,805,584	3.53%
Commercial farms (both seasons)	300,956	2.35%	5,118,186	2.66%
TOTAL	12,821,767		192,672,666	-

Source: (CSA, 2010b)

Table 7.5 Traditional types of farming systems in Abobo, Gambela (Mengistu 2005)

	CROP TYPES						
	Maize	Sorghum	Pumpkin	Sweet Potato	Papaya	Mango	Wild fruits & roots
RAIN-FED							
Planting	May	May	May	April	May	*	**
Harvest	Aug-Nov	Aug-Oct	Aug	Aug-Dec	Dec-Feb	Feb-Apr	Dec-Apr
RIVER-BANK							
Planting	Oct	Oct	-	-	-	-	-
Harvest	Feb	Feb	-	-	-	Feb	-
SPRING							
Planting	Feb						
Harvest	March						

Source: Mengistu (2005) & own fieldwork 2010, 2011

Rain-fed farming: The plots are located in the forest and surrounded by trees and tall elephant grasses. The cleared forest, bush or grass is burned in April and planting performed in May, when the soil is still wet from first rains. Digging sticks are used to form ground-deep holes and

insert handful seeds (e.g. 4 corns of Maize per whole). If all seeds germinate and grow transplanting is used to fill empty spaces. Weeds remain the main problem of rain-fed agriculture[312], and three rounds of weeding have to be applied before the crops mature. After clearing forest land, plots are normally used for seven to ten years (Mengistu, 2005).

River-bank farming: After the end of flooding planting starts on riverbanks, which had be replenished with new fertile soils. Land preparation takes place during dry season. Weeds are less problematic and soils are easier to cultivate, compared to rain-fed farming.

Spring-season farming: Plots are prepared through burning of vegetation in January and seeding take place in February /March. Successful germination depends on sufficient soil moister in drying out swamp areas near riverbanks. Plant growth is fast due to hot climate, high evapotranspiration and small rains in March/April.

Rural Non-farm economy: The Table 7.6 lists results for African countries, indicating that returns from the Non-Farm economic activities account for 34% on average.

Table 7.6 Role of Rural Non-Farm Economy for rural income & employment (for African countries)

Non-farm share of rural income	Local non-farm business and employment (%)	28
	Transfers & remittances (%)	6
	Total non-farm earnings (%)	34
Non-farm share of rural workforce	TOTAL (excluding towns & secondary employment) (%)	9
	Women's share (%)	39

Source: (Haggblade et al., 2010), Table 1, Table 2, Table 3

This Share is even significantly higher if the RNFE of nearby towns is included, indicating the importance of these income opportunities for rural population.

[312] Both crop and weed seeds germinate quickly given warm temperature, sufficient rainfall, wind-driven spread of weed-seeds, and the practice of leaving residuals of grasses and weeds on the field for mulching which allows them to survive and re-sprout.

Figure 7.6 Photograph of Investor's planning map, Abobo Woreda

Source: author's photography

7.3.2 On Data sources and collection of data, Gambela case study

Table 7.7 lists the stratification of the sample.

Table 7.7 Stratified random sample of affected area, Abobo woreda

	Rural			Urban			Totals
Strata	Ind	Set	Both groups	Ind	Set	Both groups	Both groups
1 - close	15	29	44				44
2 - medium (urban + rural)	39		39	10	13	23	62
3 - far	25		25				25
Totals			108			23	131

Note: Refers to number of households in the final sample. Sampling frame based on villages in the vicinity of the investment.

Table 7.8 Thematic sections of Household Surveys in Ethiopia and Uganda

Thematic Sections of the HH-Survey(s)
1) Personal Information of Respondents
2) Household members' characteristics, EDU, health, hours spent on tasks, etc.
3) Employment history and current employment
4) Land and agricultural inputs
5) Shocks and coping strategies (HH-level)
6) Assets (HH-goods, econ trees, housing, livestock)
7) Livelihood strategy (source of food, source of income, Use of forest products [Eth only])
8) Food Security
9) Employment & Recruitment / Job application
10) Opinion about Investment Project
11) Happiness & Perception of HH within community
12) Membership, Access to Media and Relation to local leaders
13) Access to credit and other transfers
14) Opinion on Education
15) Knowledge on growing rice / rice-growing performance (*Uganda only*)

Figure 7.7 Distribution of net-profit for an average day of business (total revenue – expenses), Abobo town businesses, Ethiopia

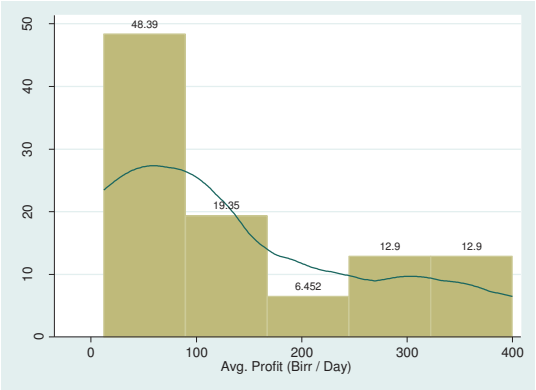
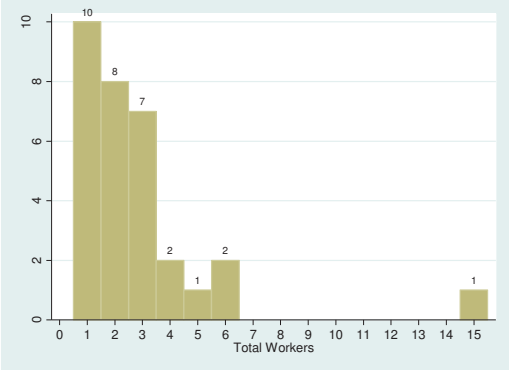


Figure 7.7 depicts the distribution of net-profit of the 31 businesses (birr/ day). The 'profit' was calculated by the average total revenue stated by each business minus the average daily total costs/ expenses. As we see is the profit range for most business below 100 birr/ US$ 6.10 per day (about 50% of the business). The minimum was at 12 Birr/day (US$ 0.73/day). A substantial share of business can reach profits between 100-175 birr per day (ca. US$ 6-10) (ca. 20%) and still a good share of business can reach profits of above 250 Birr/ US$ 15 per day (ca. 25%), with a few cases stating as much as 400 Birr/ ca. US$ 25 a day [for rural Ethiopia this is a very good income; equivalent of ca. US$ 130 in ppp terms].

Figure 7.8 Frequency of total people working in one business



As can be seen from Figure 7.8 most businesses are „small" regarding to total sum of people employed/working. The vast majority is run by 1-3 people (25 out 31 business), a few have 4-6 people employed (5 out of 31) and one case sticks out with 15 people employed (car repairing shop/ workshop, run by a big household of 15 members, and the owner stated that all are working in the shop if needed).

7.3.3 Model calibration in Ethiopia Case

Table 7.9 Estimations of available full time jobs in study area (with-out investment)

	Amount of jobs	per month	filled locally	per year
Abobo town	Hospital	12	100%	144
	Restaurants & Bar	15	100%	180
	Shops	15	100%	180
	Garage, etc.	10	100%	120
Other villages	shops	15	100%	180
	PA s (extension workers)	18	50%	108
	Teacher	24	50%	144
	NGOs	15	50%	90
	Civil Servants	50	50%	300
Agr. Inv.	Eth commercial farms	100	50%	600
Shares	TOTAL	274		2046

Explanation of Tables on next pages: One problem of calibrating the model is to justify the combination of activities for both groups. I chose to use the frequency of the activities as stated in the survey, to justify the weighting of activities. The Table 7.11 below indicates the primary occupation (excluding farming) of the 131 households interviewed.

The Table 7.10 below should be read as one continues table across a long page (i.e. the first, green line continues in the table below. The table reads in the row the sub-activities that are lumped together in the main activities of the model, and in the columns the input requirements and revenues generated (lower part of the page). Values are derived from the HH survey conducted in the surrounding of the Saudi Star investment, in Jan 2011. Selection of sub-categories is based on frequencies in survey and triangulated through qualitative data obtained at location.

Table 7.10 Background tables for both group's activities in the simulation model, Ethiopian Case (Chapter 3)

	PRODUCTION					INPUT				As a unit of refence, I take a year of production for agriculture, and monthly figures for the other activities									
GROUP 1 Indigenous						Input Requirements				12	1 week	TOTAL (12 weeks)		36	1 week	TOTAL 36 weeks)			
						AGR Land		OPEN Land		PEAK Labour				OFF_Peak Labour				CAPITAL	
Y1-Y6 / fi(xi)						X1		X2		X3.1				X3.2				X4	
Grouping of Activiti	Activity	Description		weight	ac	Land_private [ha]	AGR Land weighted	Land_com [ha]	OPEN Land weighted	Labour_peak [ratio]	Labour_AIU/ week_	Labour_peak[days/year]	PEAK L weighted	Labour_non-peak [ratio]	Labour_AIU / week_	Labour_non-peak [days/year]	OFF_Peak L weighted	Capital/ Assets [Birr]*	CAPITAL weighted
Agr. Prod	Maiz (qt / ha)	Cultivation of	0	0.875	1	1	0.875	0	0	6	20	240	210	9	10	360	315	100	87.5
Agr. Prod	Sorghum (qt/ ha)	""	0	0.125	1	1	0.125	0	0	6	20	180	22.5	9	20	240	30	100	12.5
Non-intense Land-use	Firewood (sold as chart coal) +Ti	""	0	0.25	4	0	0	10	2.5	1	1		0.25	3	3		0.75	5	1.25
Non-intense Land-use	Fruits & Roots collection	Collection in	0	0.25	4	0	0	5	1.25	1	1		0.25	5	5		1.25	0	0
Hunting	Hunting	Collective	0	1	4	0	0	100	100	3	2		2	9	10		10	100	100
Non-intense Land-use	Fishing	Especially boys	0	0.5	4	0	0	0	0	1	1		0.5	3	3		1.5	10	5
Self-employ	Alcohol brewing	Using Maize to	0	1	5	0	0	0	0	1	1		1	3	3		3	400	400
Wage-employ	Civil servant	Kebele	0	0.3	6	0	0	0	0	1	6		1.8	3	6		1.8	700	210
Wage-employ	casual labour	Highlander	0	0.1	6	0	0	0	0	1	6		0.6	3	6		0.6	750	75
Wage-employ	working in town (restaurant, hot	Jobs at the	0	0.2	6	0	0	0	0	1	6		1.2	3	18		3.6		0
Wage-employ	worker for investment farm	Some jobs on	0	0.15	6	0	0	0	0	1	6		0.9	3	18		2.7	0	0
Wage-employ	Guard etc (Saudi)	Guard or	0	0.25	6	0	0	0	0	1	6		1.5	3	18		4.5		0

YIELD / Return				SCALE EFFECT	COSTS		REVENUE		COMMENT	
Outputs				in-/decreasing, constant Marginal costs	Transport Costs	Revenue	GROS-Revenue (market - transport)			
Amount	Unit	Time Unit	Price / Wage	0 - decreasing; 1 - constant; 2- increasing	Cost / Unit [Birr]*	Market** price / Unit [Birr]*	Net-Rev/Unit [Birr]*	REVENUE weighted	Sources	Note
5.5	qt/ha	Year	200		50	200	825	721.875	Field Interviev	200 Birr/qt at local market; transport depends on distance: Highlander closer therefore lower!
9	qt/ha	Year	200		50	200	1350	168.75	Field Interview	Jan12
1	Sack	Month	60 - 70	0	20	65	45	5.625	Field Interviev	5 birr asset to show need to light fire, etc.; transportation costs higher for Anyuak because of remote location and no means of transportation; often sold on the next street inst
6	bundle	Month	10- 30	0	0	25	150	18.75	Community Su	Fruits and roots are complementary food soruces; especially during dry season. They are not marketed! The value is calculated as a comparison of 1 meal for the family
1	animal (gan	Month	15 - 100kg		0	2000	2000	500	Field interviev	Hunting normaly take place for several days and in groups of 4-10 men; Game meat is not sold, but price derived from alternative to buy meat on market (market price - 50-60Bi
4	1-2 Fish (bi	Month	20-30	0	10	35	100	50	Field interviev	Youth/boys fish whole day (after school) to get some fish (Weet); sell them locally, or consume same day; Little market available (mainly in Abobo town & Vill 17 -thus cheaper
60	L	Month	15		0	15	900	900	Field intervei I	Women use/buy a sack of maize for 100 Birr and get about 225 Birr return (in one day) they usually do this 3-4 times per month
1	monthly sal	Month	700	1	0	700	700	210	Survey	1 monthly salaries;
1	monthly sal	Month	750	1	0	750	750	75	Survey, media	1 monthly salaries; surprising that Anyuak have median higher monthly pay, most likely due to shortage of labout
1	monthly sal	Month	750			750	750	150	Survey	
1	monthly sal	Month	550	1	0	550	550	82.5	Sruvey	working 6 days a week for 23 birr aday minus some insurance gives them 550 a month (for those jobs on the investment / other investors)
1		Month	900			900	900	225		

GROUP 2 Settler	PRODUCTION					INPUT				As a unit of refence, I take a year of production for agriculture, and monthly figures for the other activities									
						Input Requirements				12	1 week	TOTAL (12 weeks)		36	1 week	TOTAL 36 weeks)			
						AGR Land		OPEN Land		PEAK Labour				OFF_Peak Labour				CAPITAL	
Y1-Y6 / fi(xi)						X1		X2		X3.1				X3.2				X4	
Grouping of Activiti	Activity	Description		weight	ac	Land_private [ha]	AGR Land weighted	Land_com [ha]	OPEN Land weighted	Labour_peak [ratio]	Labour_AIU/ week_	Labour_peak[days/year]	PEAK L weighted	Labour_non-peak [ratio]	Labour_AIU / week_	Labour_non-peak [days/year]	OFF_Peak L weighted	Capital/ Assets [Birr]*	CAPITAL weighte
Agr. Prod	Maiz (qt / ha)	""	1	0.875	1	1	0.875	0	0	4	15	180	157.5	6	8	288	252	144	126
Agr. Prod	Sorghum (qt/ ha)	""	1	0.125	1	1	0.125	0	0	4	15	120	15	6	15	180	22.5	100	12.5
Agr. Prod (Ochs/ hired)	Maiz (qt / ha)	""	1	0.7	2	1	0.7	0	0	1	11.5	138	96.6	4	8	288	201.6	700	490
Agr. Prod (Ochs/ hired)	Sorghum (qt/ ha)	""	1	0.3	2	1	0.3	0	0	1	11.5	138	41.4	4	8	288	86.4	700	210
Non-intense Land-use	Firewood (sold as chart coal)+tin	""	1	0.8	4	0	0	10	8	1	1		0.8	3	3		2.4	5	4
Non-intense Land-use	Fishing	""	1	0.2	4	0	0	0	0	1	1		0.2	3	3		0.6	10	2
Self-employ	Alcohol brewing	""	1	0.55	5	0	0	0	0	1	1		0.55	3	3		1.65	400	220
Self-employ	trading/ shop keeping	""	1	0.15	5	0	0	0	0	1	5		0.75	3	15		2.25		0
Self-employ	Restaurant/hotel	""	1	0.15	5	0	0	0	0	1	7		1.05	3	21		3.15		0
Self-employ	Renting house/hut	Only in Abobo	1	0.15	5	0.125	0.01875	0	0	1	8		1.2	3	24		3.6	1000	150
Wage-employ	Civil servant	""	1	0.3	6	0	0	0	0	1	6	72	1.8	3	6	216	1.8	800	240
Wage-employ	casual labour	""	1	0.15	6	0	0	0	0	1	6	72	0.9	3	6	216	0.9	700	105
Wage-employ	working in town (restaurant, hot	""	1	0.1	6	0	0	0	0	1	6		0.6	3	18		1.8		0
Wage-employ	worker for investment farm	""	1	0.2	6	0	0	0	0	1	6		1.2	3	18		3.6	0	0
Wage-employ	Guard etc (Saudi)	Guard or	1	0.25	6	0	0	0	0	1	6		1.5	3	18		4.5		0

YIELD / Return				SCALE EFFECT	COSTS		REVENUE		COMMENT	
Outputs				in-/decreasing, constant Marginal costs	Transport Costs	Revenue	GROS-Revenue (market - transport)			
Amoun	Unit	Time Unit	Price / Wage	0 - decreasing; 1 - constant; 2- increasing	Cost / Unit [Birr]*	Market** price / Unit [Birr]*	Net-Rev/Unit [Birr]*	REVENUE weighted	Sources	Note
7	qt/ha	Year	200		25	200	1225	1071.875	Field Interviev	200 Birr/qt at local market; transport depends on distance: Highlander closer therefore lower!
9	qt/ha	Year	200		10	200	1710	213.75	Field Interview Jan12	
18	qt/ha	Year	200		15	200	3330	2331	Field Interviev	200 Birr/qt at local market; transport depends on distance: Highlander closer therefore lower!
9	qt/ha	Year	200		15	200	1665	499.5	Field Interview Jan12	
1	Sack	Month	60 - 70	0	10	65	55	44	Field Interviev	Interesting: among both groups only very small share indicated selling for these products as jobs (i.e. potentially lacking market + not considered as "business")
4	1-2 Fish (bi	Month	20-30	0	5	35	120	24	No case in the	In general fishing is likely to be underestimated in ist contribution to household consumption
60	L	Month	15				900	495	Field intervei	Feb6; + HH-survey data
1	monthly inc	Month	1100			1100	1100	165	hh-survey	Only 4 trader where in the survey - mainly in Abobo Town; sadly no information about capital requirements!?
1	monthly inc	Month	764.4		0	1	764.4	114.66	hh-survey	Average from 3 teashops surveyed (range from 600-900 birr per month
1	hut	Month	100	1	0	1200	1200	180	Community In	Highlanders start constructing huts to supply migrants with space to live. This needs initial investment, but pays of after the first year. Migrants are not allowed to own land i
1	monthly sal	Month	800	1	0	775	775	232.5	Survey	1 monthly salaries; highlander seemed to get higher salaries - probably language access problem for local worker
1	monthly sal	Month	700	1	0	700	700	105	Survey; media	1 monthly salaries; surprising that Anyuak have median higher monthly pay, most likely due to shortage of labout
1	monthly sal	Month	750			750	750	75	Survey	
1	monthly sal	Month	550	1	0	550	550	110	Survey	working 6 days a week for 23 birr aday minus some insurance gives them 550 a month (for those jobs on the investment / other investors)
1		Month	900			900	900	225		

Source: Authors compilation based on HH Survey – copied from large excel-sheet (for further information request sheet from author).
Note: Selection of activities based on frequency stated in HH survey and importance to overall HH income; Weights applied according to overall relevance of each activity within it sub-group (i.e. for Agr. Prod. Share of plots planted with named crop/total amount of cropped plots); Mean values taken; unless highly skewed; For information not available from HH survey, other data sources inquired (e.g. expert interviews, village group discussion or 2nd data)

Table 7.11 Overview over activities – frequencies as stated in Household survey (justifying weights)

				HIGHLANDER					ANYUAK			
PrimOccup	Match with Code	Matching types	count	Frequ(Settler)	Share(Settler)	ShareSubgroup	weights	count	Frequ (Ind)	Share(Ind)	ShareSubtotal(Ind)	wheigths
HUNT-GATHERING	4				0					0		
Sell charc/timber	4.1	HNG		2	4.9%	**100.0%**	**0.8**		2	2.7%	25.0%	0.25
Hunting	4.2	HNG	n.a		0.0%		0	n.a		0.0%		0.25
fishing	4.3	HNG		0	0.0%	0.0%	0.2		6	8.2%	**75.0%**	**0.5**
SUBTOTAL	*4.9*		***2***			*100.0%*	*1*	***8***			*100.0%*	*1*
SELFEMPLOYMENT	5											
SelltradAlc	**5.1**	Self-empl		8	19.5%	**66.7%**	**0.55**		48	65.8%	**100.0%**	**1**
trad/ small business	5.3	Self-empl		2	4.9%	**16.7%**	**0.15**		0	0.0%	**0.0%**	**0**
Renting house	5.5	Self-empl	n.a		0.0%		0.15	n.a		0.0%		**0**
tea Shop/ restaurant	5.4	Self-empl		2	4.9%	**16.7%**	**0.15**		0	0.0%	**0.0%**	**0**
SUBTOTAL	*5.9*		*12*			*100.0%*	*1*	*48*			*100.0%*	*1*
OFFFARM Jobs	6											
Civil Serv	**6.1**	Offjob		8	19.5%	**29.6%**	**0.3**		5	6.8%	**33.3%**	**0.3**
Agr worker (other Inv)	6.2	Offjob		1	2.4%	3.7%			0	0.0%	0.0%	
Casual Work	6.2	Offjob		3	7.3%	11.1%	0.15		1	1.4%	6.7%	0.1
Craftsmann	6.3	Offjob		1	2.4%	3.7%			0	0.0%	0.0%	
health Worker	6.3	Offjob		1	2.4%	3.7%	0.1		3	4.1%	**20.0%**	**0.2**
Agr Worker (Saudi)	6.4	Offjob		6	14.6%	**22.2%**	**0.2**		2	2.7%	**13.3%**	**0.15**
Guard Saudi	6.5	Offjob		1	2.4%	3.7%			2	2.7%	**13.3%**	
Mechnic (Saudi)	6.5	Offjob		5	12.2%	**18.5%**			2	2.7%	**13.3%**	
Operator (Saudi)	6.5	Offjob		1	2.4%	3.7%	0.25		0	0.0%	0.0%	0.25
SUBTOTAL	*6.9*		***27***			*100.0%*	*1*	***15***			*100.0%*	*1*
other				0	0.0%				2	2.7%		0
TOTAL				**41**	**100.0%**				**73**	**100.0%**		

Table 7.12 Results of sensitivity testing for both LPs (reporting change in level and composition of income + shadow prices), Gambela Case

		Shadow prices [Birr]							Shares of Activities [% of total revenue]							Totals	
Code	Group	Aland	Oland_Hn	Oland_gath	Lpeak	Lopeak	Oxdays	Capital	AGR1	AGR2	LC	HN	GATH	SELF	JOB	Revenu[Mio-Birr]	ppp$/ capita/ day
Base	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	22.3%	0.0%	0.0%	16.7%	29.3%	18.5%	13.3%	6.1	0.93
Base	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	1.6%	41.8%	0.0%		7.0%	37.5%	12.1%	4.7	1.32
Aland +sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	22.3%	0.0%	0.0%	16.7%	29.3%	18.5%	13.3%	6.1	0.93
Aland +sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	1.6%	41.8%	0.0%		7.0%	37.5%	12.1%	4.7	1.32
Aland -sd	Ind	39.3	14.7	24.5	6.8	0.0	276.4	0.0	22.4%	0.0%	0.0%	16.6%	29.2%	18.6%	13.3%	6.1	0.93
Aland -sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	1.6%	41.8%	0.0%		7.0%	37.5%	12.1%	4.7	1.32
Oland +sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	21.1%	0.0%	0.0%	17.6%	30.9%	17.7%	12.7%	6.4	0.97
Oland +sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	1.6%	41.5%	0.0%		7.6%	37.3%	12.0%	4.8	1.33
Oland -sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	23.5%	0.0%	0.0%	15.7%	27.6%	19.3%	13.9%	5.8	0.89
Oland -sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	1.7%	42.1%	0.0%		6.3%	37.8%	12.2%	4.7	1.31
HH-size +sd	Ind	39.3	14.7	24.5	6.8	0.0	276.4	0.0	31.2%	0.0%	0.0%	14.8%	25.9%	16.4%	11.7%	6.9	1.05
HH-size +sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	8.6%	38.8%	0.0%		6.5%	34.9%	11.2%	5.1	1.42
HH-size -sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	10.8%	0.0%	0.0%	19.1%	33.6%	21.2%	15.2%	5.3	0.81
HH-size -sd	Set	0.0	0.0	8.4	23.8	0.0	0.0	0.0	0.0%	28.7%	0.0%		8.8%	47.3%	15.2%	3.8	1.05
Ox own +sd	Ind	0.0	14.3	21.7	17.5	0.0	0.0	0.0	0.0%	41.7%	0.0%	12.5%	22.0%	13.9%	10.0%	8.1	1.24
Ox own +sd	Set	0.0	0.0	8.4	23.8	0.0	0.0	0.0	0.0%	45.4%	0.0%		6.7%	36.2%	11.7%	4.9	1.37
Ox own -sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	22.3%	0.0%	0.0%	16.7%	29.3%	18.5%	13.3%	6.1	0.93
Ox own -sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	20.7%	0.0%	0.0%		9.8%	52.6%	16.9%	3.4	0.94
Capital +sd	Ind	0.0	14.7	24.5	7.0	0.0	279.4	0.0	16.9%	0.0%	0.0%	12.9%	22.7%	37.1%	10.3%	7.9	1.20
Capital +sd	Set	0.0	0.0	10.4	7.5	0.0	485.9	0.0	0.2%	28.1%	0.0%		4.7%	58.9%	8.1%	7.0	1.96
Capital -sd	Ind	0.0	7.3	0.0	5.8	0.0	0.0	14.9	40.1%	0.0%	0.0%	27.7%	32.2%	0.0%	0.0%	3.7	0.56
Capital -sd	Set	0.0	0.0	8.3	4.9	0.0	0.0	3.2	45.3%	31.4%	0.0%		23.2%	0.0%	0.0%	1.4	0.40

Table 7.12 shows the results of a sensitivity test for both LPs. For all seven endowments values were tested for plus and minus one standard deviation from the mean value. It shows that change in agricultural land has now impact on the overall output per group. We see however, that for the indigenous group under a smaller initial value, land clearing starts and the shadow price for one hectare raises to approx. 40 Birr. Similar results happen, if we had assumed much larger family size of above 7.3 people per household. Biggest impact on overall wealth levels for the indigenous group has higher initial capital, which however, is mainly due to the fact that the initial capital was also used as market constraint for self-produced goods. Otherwise an increase of Oxen or labour has the largest impact for both groups. A further constraint in capital by one standard deviation has the highest negative impact. Capital endowment has a huge variation across households in the sample.

Table 7.13 Number of jobs created over time at Saudi Star Investment

Labour demand	2007	2010	2015
Unskilled worker	0	500	3,000-7,000*
Semi-skilled worker	0	200	1,000
Skilled worker	0	100	400

Source: Interview with LSAI manager (Aug 2010)
Note: The huge variation of unskilled labour demand is explained by the technology chosen to plant & transplant rice. If transplanting of seedlings is done manually, demand will be very high (throughout the year, as irrigation allows yearlong cultivation: 2-3 harvests per ha).

7.3.4 Additional results from simulations

This section displays additional results from the linear optimisation of the Ethiopian case model.

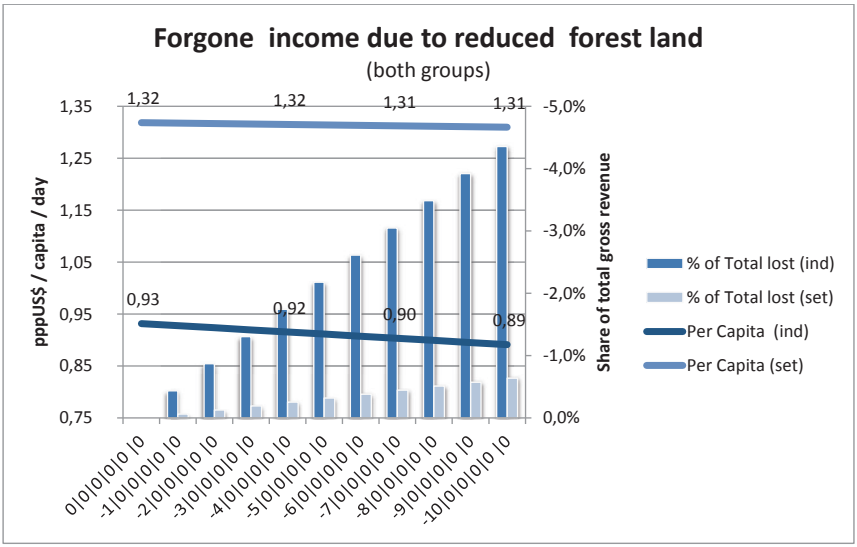
Table 7.14 Change in level of income due to lost access to prior forest land (both groups)

	Indigenous			Settler		
Scenario	Total (Birr)	Per Capita (pppUS$)	% Change (as of base)	Total (Birr)	Per Capita (pppUS$)	% Change (as of base)
0|0|0|0|0 |0	6,111,976	0.93	100.0%	4,741,384	1.32	100.0%
-1|0|0|0|0 |0	6,085,350	0.93	99.6%	4,738,354	1.32	99.9%
-2|0|0|0|0 |0	6,058,724	0.92	99.1%	4,735,325	1.32	99.9%
-3|0|0|0|0 |0	6,032,098	0.92	98.7%	4,732,295	1.32	99.8%
-4|0|0|0|0 |0	6,005,473	0.92	98.3%	4,729,266	1.32	99.7%
-5|0|0|0|0 |0	5,978,847	0.91	97.8%	4,726,236	1.31	99.7%
-6|0|0|0|0 |0	5,952,221	0.91	97.4%	4,723,207	1.31	99.6%
-7|0|0|0|0 |0	5,925,595	0.90	97.0%	4,720,177	1.31	99.6%
-8|0|0|0|0 |0	5,898,970	0.90	96.5%	4,717,148	1.31	99.5%
-9|0|0|0|0 |0	5,872,344	0.90	96.1%	4,714,118	1.31	99.4%
-10|0|0|0|0 |0	5,845,718	0.89	95.6%	4,711,089	1.31	99.4%

Note: The code under scenario stands for the six potentially changing factors due to the emergence of the investment in the area. The first number indicates a % change in open access land available for each group.

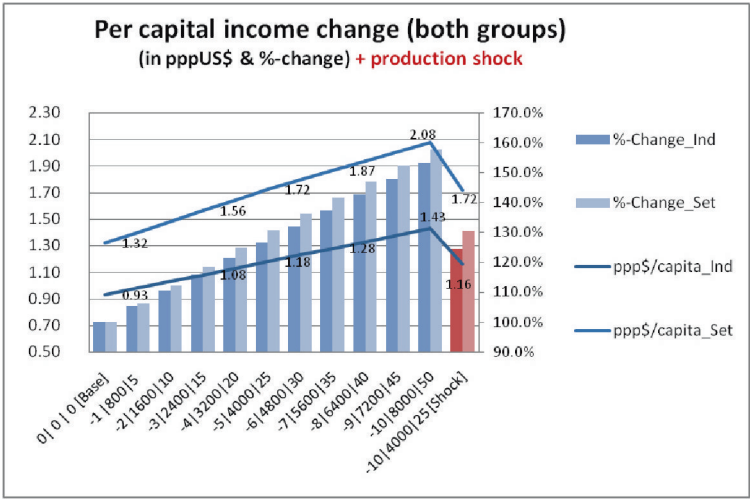
The simulation runs a step-wise growth of the commercial farm, with each time 1,000 hectares of land cleared and thus locals loosing access to forest/ scrubland and its resources. Figure 7.9 lists the change in overall income levels, per capita levels and relative change to base scenario for both groups.

Figure 7.9 **Forgone income due to loss of forest land as investment expands (in 1,000 ha steps)**



Note: The code under scenario stands for the six potentially changing factors due to the emergence of the investment in the area. The first number indicates a % change in open access land available for each group.

Figure 7.10 **Changes in income levels due to evolution of the large-scale investment (absolute and relative)**



Note: codes describe the change in factors: -K ha *Oland* | +*Jobs* | +%*SELF*-demand.

Figure 7.11 **Change in relative share of livelihood activities in overall income across all five scenarios, both groups, Ethiopia**

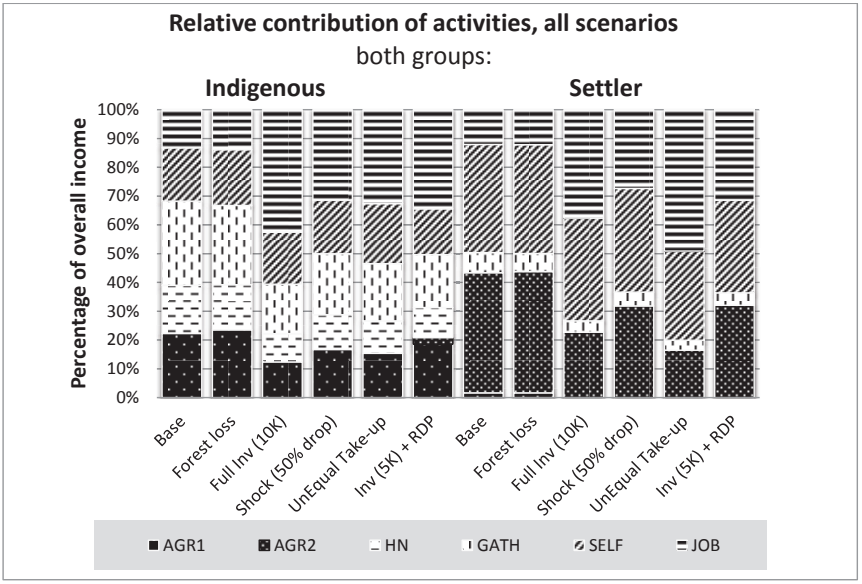


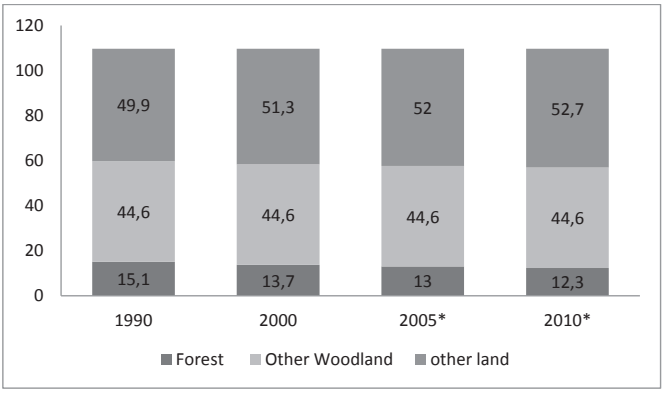
Table 7.15 **Trend of shadow prices of different inputs across scenarios (absolute values) – Gambela Case study**

Group	Scenario	Base	Forest loss	LSLAs (10K ha)	LSLAs (5K) + RDP	
	Code	0|0|0|0|0 |0	-10|0|0|0|0 |0	-10|8000|50|0|0 |0	-5|6000|30|40|50 |0	*Unit*
Ind	Aland	0.0	0.0	0.0	0.0	*ha*
	Oland_Hn	14.7	14.7	14.7	14.6	*ha*
	Oland_gath	24.5	24.5	24.5	23.5	*ha*
	Lpeak	7.0	7.0	7.0	10.5	*day*
	Lopeak	0.0	0.0	0.0	0.0	*day*
	Oxdays	279.4	279.4	279.4	302.4	*day*
	Capital	0.0	0.0	0.0	0.0	*Birr*
Set	Aland	0.0	0.0	0.0	0.0	*ha*
	Oland_Hn	0.0	0.0	0.0	0.0	*ha*
	Oland_gath	10.4	10.4	8.4	7.6	*ha*
	Lpeak	7.5	7.5	23.8	29.7	*day*
	Lopeak	0.0	0.0	0.0	0.0	*day*
	Oxdays	485.9	485.9	0.0	0.0	*day*
	Capital	0.0	0.0	0.0	0.0	*Birr*

Note: Values in Birr (Jan 2011 values used for pricing in the model).

7.3.5 *Natural resource endowment in Ethiopia & Gambela Region*

Figure 7.12 Change in forest cover in Ethiopia 1990 – 2010 (in million ha)



Note: * Prognoses from WBISPP 2004, based on evaluation of past rate, and NDVI change in satellite images. Source: (FAO, 2010; WBISPP, 2004).

Table 7.16 Estimations for forest cover change in Ethiopia & Gambela (Estimations from WBISPP 2004)

		Forest	"High" wood land	Plantation	Low woodland/ Scrubland	Other land (incl. Agr. Land)	Water	Total
2000								
Ethiopia	Total			509,422				
		3,651,935	10,049,079		46,297,530	53,169,093	828,277	114,505,336
Gambela	Total			-				
		491,805	899,578		422,042	1,371,684	-	3,185,109
	Share	13.5%	9.0%	0.0%	0.9%	2.6%	0.0%	2.8%
2005								
Ethiopia	Total			509,422				
		3,337,988	9,632,616		46,297,530	53,436,723	828,277	114,505,336
Gambela	Total			-				
		461,586	899,578		422,042	939,122	-	3,185,109
	Share	13.8%	9.3%	0.0%	0.9%	1.8%	0.0%	2.8%
2000 -2005								
Ethiopia	Change	-8.6%	-4.1%	0.0%	0.0%	0.5%	0.0%	0.0%
Gambela	Change	-6.1%	0.0%	0.0%	0.0%	-31.5%	0.0%	0.0%

Source: (WBISPP, 2004)

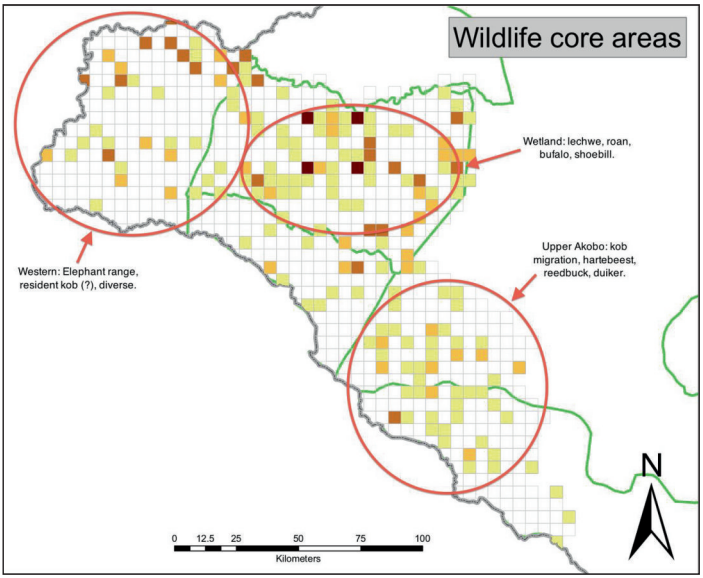
7.3.6 Natural resource base in Gambela: Forest area, wildlife and national park plans

Table 7.17 Wildlife sightings and number of individuals, entire survey area.

Species	No. Sightings	Total Individuals
Elephant	1	6
Ostrich	1	4
Bushbuck	2	2
Crocodile	2	2
Patas monkey	3	8
Waterbuck	3	10
Baboon	5	75
Nile lechwe	5	34
Hartebeest	6	15
Oribi	6	9
Roan	7	23
Shoebill stork	7	7
Giraffe	8	89
Tiang	9	34
Common duiker	17	21
Buffalo	22	1020
Reedbuck	36	57
Warthog	52	140
White-eared kob	163	29685

Source: (Trans Frontier Conservation Initiative (TFCI) Task Force., 2010, p. 6)

Figure 7.13 Possible core wildlife area.



Source: (Trans Frontier Conservation Initiative (TFCI) Task Force., 2010, p. 29)

The conclusion of a report by a team of conservation specialists about situation of wildlife in Gambela park and surrounding area illustrates the high potential and thus value of the existing biodiversity and animal migration in the area for tourism and as conservation site: "*The wildlife populations in Gambella are diverse and widespread, and significant populations of many species of international and local importance are present. However, the long-term potential for conservation of wildlife and habitats in this region is threatened by habitat fragmentation and encroachment, and immediate action must be taken to demarcate and protect core areas, and work with communities to set up effective conservation and natural-resource use practices*" (Trans Frontier Conservation Initiative (TFCI) Task Force., 2010, p. 31).

7.4 Appendix D: Uganda case study

The two main strata of interest applied are 'distance' and 'growing rice'. As the motivation of the research was to identify the adoption of new technology, I compared the situation of rice growing households with those that did not grow rice. Second, adoption and employment effects might be related to distance from the LSAI, therefore the second stratum was chosen (Table 7.18 below). Six communities were selected and I decided to omit the options of 'far' and 'non-rice-growing'. Six villages were randomly selected after stratifying the list of villages within the neighbouring sub-counties.[313] Within each village, households were randomly selected from household lists compiled by village heads.

Table 7.18 Stratification of the household survey in the Bugiri district, Uganda

	Growing rice (largeshare of HH grow rice)	**Not growing rice** (only small share grows rice)
Close (within 15 km radius)	Igogo (n=28) Nainala B (n=26)	Buluwe (n=26) Bulesa (n=32)
Far (beyond 15km radius)	Kayango (n=29) Nsango (n=29)	*None*

Table 7.19 Surface structure of the Bugiri district, Uganda

Type of surface	**Area**
Forest reserves	82.7 km^2
Arable land (total)	611.3 km^2
Arable land (under cultivation)	426.4 km^2
Water bodies	4,207.2 km^2
Wetlands	631.1 km^2
Degraded forests	66.1 km^2
Total	6024.8 km^2

Source: GoU(2007)based on data from1999

In an environmental assessment conducted in 2007 the district government found that approximately 23% of the wetlands had been converted for cultivation, brick production, sand mining, or other purposes (GoU, 2007). [314]

[313] Stratification was performed together with key informants and in one of the group-discussions, and was double-checked after villages had been selected.

[314] Drainage and reclamation efforts in the district have been considered as a practical and prudent answer to ever-increasing demand for land in the district (GoU, 2007, p. 25).

Table 7.20 List of Farmers interviewed in semi-structured, biographic interviews (Bugiri)

Code	Location	Function	Age	Sex	HH-size	Inter-viewed by	Comment	Date
B1	Igogo Village	Vice-Village head	46	M	12	Dani	-,	23/05/2013
B2	Namasere	Group leader / former LC3 head	52	M	8	Dani	-, former LC3 head; used to run brick factory at Kibimba until 1997 with about 30-40 worker underneath him	23/05/2013
B3	Buwuni	Former LC1 head	72	M	8	Dani	-, former LC1 head, one of the firs rice grower; worked with Kibimba since 1968; block manager and leader of "outgrower organisation" (1992-97)	24/05/2013
B4	Nainala B.	Rice growing women	30	F	12	Dani	Rice growing lady;	24/05/2013
B5	Igogo	Rice growing women	51	F	13	Brenda	Rice growing lady	23/05/2013
B6	Buwuni	Former Worker at Kibimba / 1st generation rice grower	58	M	22	Brenda	-; Worker under kibimba and member of Out-grower group;	24/05/2013
B7	Nainala B.	Wife of LC1 head	47	F	11	Brenda	; mentions schools fees as motivation to grow rice (cash need).	24/05/2013
B8	Igogo	Rice grower	43	M	9	Derrick	-; Edu: P4 ; 2 wifes; lots of land – rents out (for cash and due to social obligations)	23/05/2013
B9	Namasere	Rice grower	45	M	11	Derrick	-	23/05/2013
B10	Buwuni	1st generation worker with kibimba	67	M	12	Derrick	-; Worked with Kibimba 1975-1992;	23/05/2013
B11	Namasere	Rice growing women	40	F	8	Eriya	- first woman in her community to grow rice	23/05/2013
B12	Buwuni	Late starter rice grower	50	M	11	Eriya	- started in 2002	24/05/2013
B13	Nainala B.	2nd generation grower	23	M	6	Eriya	; 2nd generation rice grower; currently forming a group	24/03/2013
B14	Namasere	Rice growing women	48	F	13	Brenda	, wife of Samuel Kange;	23/05/2013

Note: Farmers were interviewed in semi-structured, biographic interviews about their reasoning to start growing rice, opening/conversion of wetland, knowledge on growing rice, technology of planting applied and where they source inputs and sell outputs. Interviews took between one and two hours.

Figure 7.14 Households asset disaggregates by type of asset, over ricefarmer and households with at least one member working for Tilda (Uganda, 2011 HH survey)

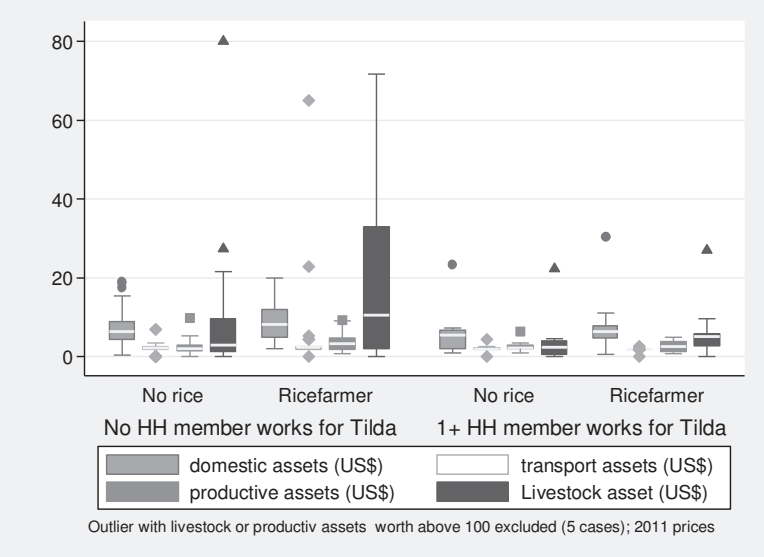
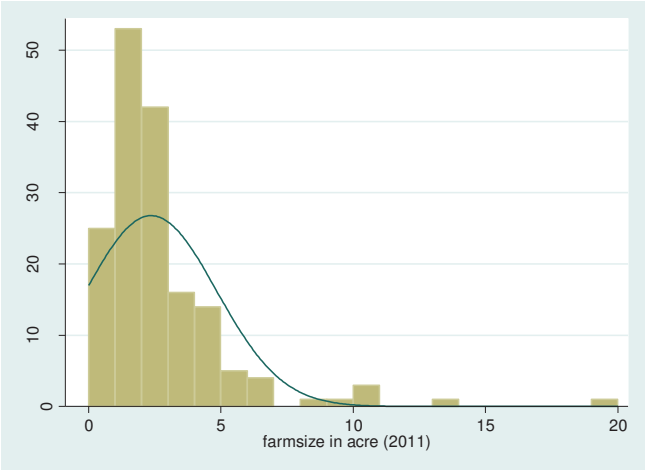


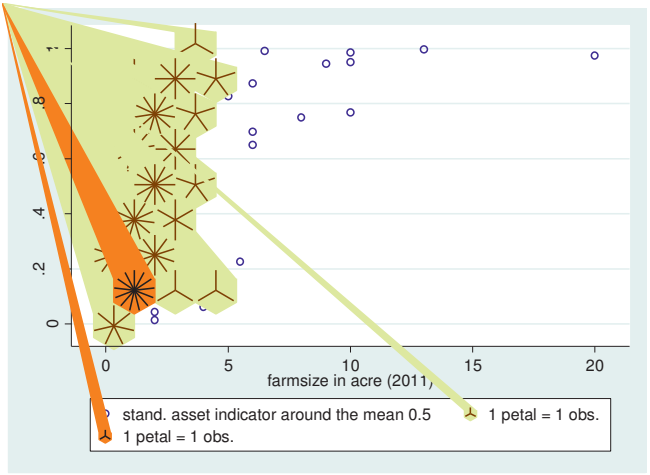
Figure 7.14 depicts the disaggregated picture. It reveals again that the group of rice-farmers with no household member working for Tilda tend to be the richest. Their wealth is mainly stored in animals/ livestock, which in this case is both: a storage for wealth and a productive asset, if these households have cows, etc. to produce milk. The share of animals owned is smallest among those households working for Tilda and not growing rice.

Figure 7.15 **Distribution of farm sizes in the sample population of the Bugiri district, Uganda (2011)**



Note: mean farm size was 2.3 acres (0.93 ha), N=166 observations

Figure 7.16 **Relationship between farmsize and moveable assets of the sample population of the Bugiri district, Uganda**



Note: Households with high rankings in moveable assets indicator have also biggest farms. Most households have less than 3 acres.

Table 7.21 Knowledge of rice growing and rice growing in autumn 2010 (2011 Survey data)

	Freq.	Percent	Cum.
Does not know how to grow rice/does not grow rice	69	40.6%	40.6%
Knows how to grow rice/does not grow rice	46	27.1%	67.6%
Knows how to grow rice/grows rice	53	31.2%	98.8%
Missing	2	1.2%	100.0%
Total	170	100.0%	

7.4.1 Methods applied

Table 7.22 Household domestic asset index for Uganda

ASSET (g)	Number owned	Weight of asset (Wg)	Age (adjustment)	
Domestic assets			< 5 yrs	> 5 yrs
Stove		2		
Refrigerator		4		
Radio		2		
TV		4		
Mobile phone		3		
Chairs		1		
Mosquito nets		1	x 1	x 0.7
Couch		*2*		
Bed		*2*		
Mattress (good)		*1*		
Bowls/pots		*0.25*		
Dishes/glasses		*0.1*		
Jerican		*0.5*		
Table		*1*		
Transport			< 5 yrs	> 5 yrs
Car/truck		160		
Motorcycle		48	x 1	x 0.7
Bicycle		6		
Cart		12		
Productive			< 5 yrs	> 5 yrs
Hoes		1		
Spade/shovel		1		
Plough		4		
Sewing machines		4	x 1	x 0.7
Sprayers		*3*		
Axes/sickles		*1*		
Fishing net		*1*		
Animal				
Bull/cow		10		
Heifer/oxen		8		
Calves		4		
Horses		10	*No adjustment*	
Sheep/goats		3		
Poultry		1		
Pigs		2		

Source: Adapted from ILRI/ Njuki et al. (2011, p. 9)

7.4.2 Further findings from analysis

Table 7.23 Source of knowledge about rice growing by the decade that farmers started to cultivate rice

Decade started growing rice	Source of knowledge on growing rice						
	Parents	Neighbours	Working at KRS	Working at Tilda	Extension	Other	Total
1970s		1					1
1980s			2			1	3
1990s	2	6			1	2	11
2000s	14	12	1		1		28
2010/11	4		2	1		1	8
Total	20	19	5	1	2	4	51

Thematic Sections of the HH-Survey(s)
1) Personal information of respondents
2) Household member characteristics; EDU, health, hours spent on tasks, etc.
3) Employment history and current employment
4) Land and agricultural inputs
5) Shocks and coping strategies (HH-level)
6) Assets (HH-goods, econ trees, housing, livestock)
7) Livelihood strategy (source of food, source of income, use of forest products [Eth only])
8) Food Security
9) Employment & recruitment/job application
10) Opinion about LSLA
11) Happiness & perception of HH within community
12) Membership, access to media and relation to local leaders
13) Access to credit and other transfers
14) Opinion on education
15) Knowledge aboutrice growing/rice-growing performance (Uganda only)

Table 7.24 Main challenges and opportunities for the Uganda rice sector identified in GoU 2008–09 study

Actor	Challenge	Opportunity
Government/ Public policy	• Poor policies on agro-inputs and agricultural finance and poor implementation of policies on soil and water management • Farmer groups are weak and often collapse after gaining access to agricultural finance facility • Low funding to rice research • There is a general lack of motivation and limited facilitation for district extension staff • Many district extension staff lack specialized knowledge in rice production • Limited staff in development of rice sub-sector. MAAIF has only about five staff members directly working on rice and about seven other staff members and ten district extension staff who occasionally deal with rice issues. These few staff members are scattered among the various MAAIF agencies. In addition to these staff, there are other MAAIF staff members whose duties include the promotion of rice production during implementation of certain strategies.	• Establishment of the Rice Industry Secretariat in 2008 with a National Rice Steering Committee, Technical Committee and working groups. The RIS coordinates the efforts of rice stakeholders. • New linkages to development partners such as CARD member countries, AGRA, WARDA, FARA, FAO, JICA. • There is high demand and adoption of rice as a major enterprise for food security and for income • There is high regional demand for rice • Rice has a potential of attracting many researchers
Farmers	• Land tenure system or high land rental costs for rice farming or the lack of collateral for agricultural finance due lack of land titles • Inadequate knowledge on rice farming • Labour intensity in rice farming • Lack of capital for rice farming • High crop losses due to pests and diseases • Lack of appropriate implements and equipment for rice farming, most sub-counties do not even have tractors available to rent. • Drought and unreliable rain patterns • Poor quality and expensive seed • The late delivery of seed and other inputs has led to reduced production and slow multiplication of the rice seed• There is difficulty mobilizing the farmers for training/farmer field schools • Lack of enough equipment within the districts to cultivate bigger plots • Rice varieties such as NERICA 4 are very difficult to thresh and require a lot of energy to thresh manually• Poor/lack of storage facilities • Poor book keeping and financial management by farmers • Lack of drying facilities like tarpaulin or drying yard, some farmers dry the rice on the ground and this reduces the quality of rice• Poor road infrastructure especially in rice growing areas, thus negatively affecting marketing • Price fluctuations	• Land Reform/Land Act of 1995 is being revised • Strategies for training agricultural officers and farmers in rice production have been developed by MAAIF • Rice has been identified as a strategic crop for poverty alleviation by the GoU and development partners,thus interventions for improved rice production have a high potential of being supported.
Rice Processors	• High cost of rice mills with high technical performance • High cost of electricity and diesel, thus high cost of operation • Limited access to repair facilities and services • Low quantity at rice mills affecting the annual duration of rice mill operations • Low quality of rice received at rice mills • Lack of electricity in some rural places thus affecting adoption of electric rice processing machines • Poor road infrastructure especially in rice growing areas, thus negatively affecting marketing • Public-private partnerships (i.e. in fabrication of some parts)	• Increasing market for rice due to increasing population • Availability of machinery at wide range of prices • Credit availability by local banks • Rice has been identified as strategic crop for poverty alleviation by the GoU and development partners,thus interventions for improved rice processing have a high potential of being supported.
Rice Trader	Challenges • Low quality of processed rice • Low prices	Opportunities • The demand for food/rice in Uganda is increasing thus the price of rice is likely to keep increasing • High regional demand for rice in East Africa and high demand for seed in Africa
Rice input dealers	Input acquisition: Expensive transportation • Inadequate capital for doing meaningful business • Low quality seed affecting performance of inputs Input distribution and marketing: Low market for inputs due to lack of capital by rice farmers • Inadequate producer knowledge on value of improved seed and, use and management of inputs	Opportunities • Government policy indicates the need to combat soil degradation in most areas of Uganda • Vast research has been done on soil health and more research is being undertaken

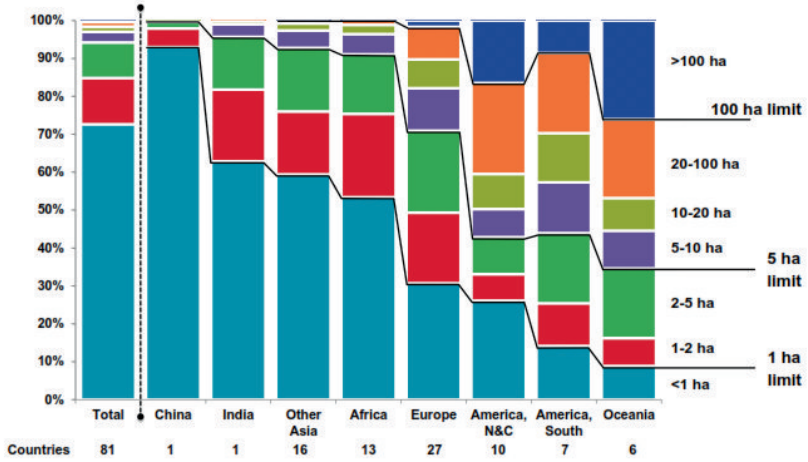
Source: (MAAIF, 2009, pp. 4–9)

7.5 Appendix E: Synthesis

Table 7.25 Application of layered approach of social analysis for the example of land, as used in this thesis.

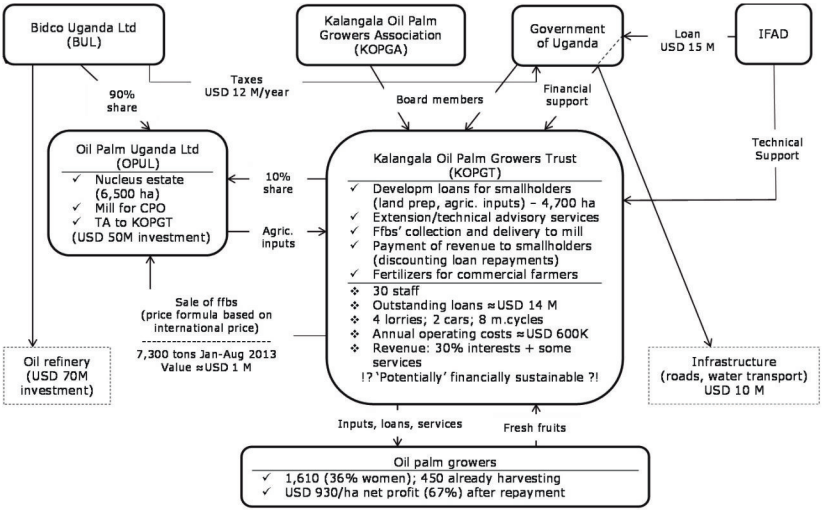
Layers of social analysis	Aspect of analysis: Land	Technique for data generation	Analysis
Social embeddedness	Identity & perceived importance for livelihoods	Interviews with famers and key informants; secondary information	Hermeneutic text analysis
Institutional environment	Property rights to land and their protection (laws, constitution, etc. - de jure & de facto)	Interviews, secondary literature, observation	Hermeneutic text analysis; Transaction economics & political economic (analytical narrative)
Governance	Land market/ land transfer & compensation	Quantitative data on land transactions; secondary data & literature; own survey; village group discussions	Analytical narrative & descriptive statistics; Transaction cost approach; triangulation;
Resource allocation	Value and price of land; change in land use & productivity	Quantitative data on land use, price and transactions + complementary factors	Linear programming model;

Figure 7.17 Regional diversity of holding size pattern in 81 countries, (2012 data)



Note: The data covers two-thirds of the world's population and 38 per cent of the world agricultural (arable) area. Different cut-off points are used, to reflect the huge variation of definitions of 'Smallholder' in various countries. For an extended discussion see HLPE (2013: p25f).
Source: Beliérès et. al (2013) in HLPE (2013: p27).

Figure 7.18 Organisation model of Kalangala Palm Oil project (positive example)



Source: IFAD presentation, 26 Feb. 2014 (unpublished).

7.6 Appendix F: Details on data generation

Example for semi structure guidelines during field work, of which several version existed, depending on who I would interview:

Interview guideline with local key-informant in Abobo (Gambela, Ethiopia – Jan – March 2011)

A Personal Background:

- How long do you live in this area? And where are you originally born?
- What is your professional background?

B Village structure:

- What is the common local entity of villages in Abobo? Do there exist "group villages"?
- Are there lists of HH for those villages? Maps?
- D.A.s – where? Who knows most?
- Who do you consider the "poorest" members of the community? (Landless, female headed households, elders, etc.)
    - What is the cause of their poverty?
    - How could it be overcome?

C HH structure:

- What is the Average size of HHs?
- How many are female headed? (percent)

D Livelihood strategies

- What is the main source of income for HHs? (share of farming; hunting; fishing; off-farm employment; others
- What role does non-farm income play?
    - What are main examples for off-farm employment?
    - What are main examples of self-employment?
- Do community members use sharing mechanisms, such as…
    - Share labour for farm work, or construction? (with other HHs?)
    - Cross-leasing of land ?
    - Share-cropping? (collectively use one plot of land with other HHs)?
- Are there other community activities done collectively in some periods?
- *What are major dangers to local HH livelihood strategies?*
    - *What* are incidence for individual HHs? (death of head, sickness, drought, disease)
    - *What* are incidence happened in the last 5 years, affecting most HHs (climate, disease?) What happen 5-10 years ago?

E Crop production / Agriculture

- What are mayor local crops (importance for income & food/nutrition)
- What are the measures for harvest? What units for local crops (quantity and price)
- Seasons (rainy season – dry season)? 2 times a year?
- What modern inputs are used among local population?
- Where does the labor come from?
    - If also hired labor – what is the payment? And what contract arrangement?
- What are the mayor steps for labor in agricultural production?
    - Land preparation, Weeding, Planting, Harvesting ,Application of fertilizer / herbicides & pesticides (?), Irrigation (?) – canal building etc. (?), Erosion prevention?, *What else?*
- What are major risks for crop production in this area?
    - What have been major problems / events in the last 5 years?
    - What in the 5years before (5-10 years ago)?
- How do local cope with them?

F Forest products & hunting:

- What are main products collected from forest area?
- What animals are mainly hunted? When?
- What is value? (in cash , as well as for the livelihood)
- What is use? (consumption / selling / medicine?) *how to measure?*
- How is right to collect? Who is allowed – when? Where?

G Livestock:

- What type of animals (list) are mainly owned by locals?
    - Sheep, Cattle, Goats, Chicken, Ducks ? / turkey ?, what else?
- What are diseases or other threats to their health? (risks)
    - Was there a mayor even in the last 5 years?
    - In the 5 years before (5-10 years ago?)
- How do local cope with them?

H Off-farm employment

- How many HHs do have some sort of off-farm income?
- What is the main employer in this region?
    - How did this change in the last 5 years?
    - How in the 5 years before (5-10 years ago)?
- Are people happy about the recent change?
    - If not, what are the reasons?
    - If yes, what are the reasons?

- What type of contracts are mainly used to employ labor?
- What is the wage level?
    - How did this change in the last 5 years?
    - How in the 5 years before (5-10 years ago)?
- What about working conditions?
    - Are people happy with them?
    - How did they change in last 5 years, and the 5 years before?
- Do you know how labor is recruited by investors?
- In the case of complains – who do you address? (village head, company, etc.)

I Land ownership

- How is land ownership organized in your community (Abobo)?
- What is the common measures / unit of land
- Exist there different names of types of land (for coding)?
- What types of transfers of land do exist?
    - Inherit to children?
    - official renting out/ in?
    - informal (renting-out/ -in)
- Is there a problem of erosion?
    - What is dealt against it?
- Are there disputes over land?
    - What are the main causes?
    - How is coped with such disputes?
    - Who decides/ allocates land?

K Investments

- How many investments are there in the region?
- How could they be categorized? What are key differences among them?
- What is the main impact of these investments on the local communities?
    - What is positive?
    - What is negative?
- What is your perception on future investments:
    - Do think more will come?
    - What will be their impact? Positive & negative
    - What role does the local community play in attracting new investments?
- Have locals been consulted prior to land deals?
    - Who, how, when, by whom?
    - If not, do you think they will be in future?
- Have you heard of guidelines for investors?
    - What do they include?
    - Who gives you such information?

L Extension services / new information & group Activities

- Who does extension services in this area? Dev Assistant – some else?
- What type of farmer groups are there?
- What other sorts of village level organization do exist?

M Access to services:

- Who provides major **health** service in this area?
    - clinic, hospital, health insurance,
    - traditional medicine, self-collected medicine?
    - Who provides them (gov, NGOs, investors?)
    - How change in last 5 years?

  - How the 5 years before (5-10 years ago)?
- What sources of education are there (schools, training centers)
  - Who provides them (gov, NGOs, investors?)
  - How change in last 5 years?
  - How the 5 years before (5-10 years ago)?
- Where is the major market?
- How did the following things change in the last 5 years, and the 5 years before:

	Last 5 years	5 years before	Provider
Food Supply?			
Food prices?			
Transportation:			
Water			
Electricity			
Other relevant infrastructure?			

N Migration of labor

- Are locals leaving Abobo for work?
- Where do they go for work? If how long? What type of work?
- Do they come back for harvest time?
- How did out-migration change over last 5 years, how the 5 years before?
- Do other groups come for work to Abobo?
- Where do they come from?
- How long do they stay? Where do they stay?
- What jobs they are mainly doing?
- How do they learn about jobs? (Information)
- How did in-migration change over last 5 years, how the 5 years before?

O Expenditure:

- What do locals mainly spend their income/wage on? (expenditure)
  - Food
  - Education (of whom?)
  - Housing?
  - Inputs for agriculture production (seeds, fertilizer, improved seeds, pesticides)
  - Consumption goods (radio, mobile phone, …)

P Horizontal inequalities – how are they perceiving the situation

- What is the main source of identify for locals? (ethnicity, religion, nationality, gender, etc.)
- Is there a difference in treatment among the groups or some regions:
  - Treatment through government
  - Treatment through investor (domestic & foreign)
- How do local ethnic groups perceive the new trends?
  - Do you see any potential for dispute among them?
  - If yes, what is done to mediate them?

Table 7.26 Questionnaire for SMEs in Abobo Town, (Gambela, Ethiopia – Feb 2011)

Code & Type		Personal Background						
Nr. [just start with 1 and keep counting]	**Type of Business** [1 - hotel, 2 - tea/coffee, 3 - restaurant, 4 - food seller, 5- shop for cloth, 6 - Chiricharo; take codes from List]	**Name of owner** [*say: information is used for academic, but in case of follow up]*	**Sex** [1 - male; 2 - female]	**Ethnicity** [1 - Highlander; 2 - anuak; 3 - nuer; 4 - other] ***Observe !***	**Age** [years]	**Education level** [1- no edu; 2 - grade 4; 3 - grade 8; 4 - grade 10; 5 - above]	HH-Size	**How many HH-members are working on the business?** [number]

Migration						Business
Did you already live here in 1998 E.C.? [1 -yes, 2 - no]	**If not, when did you move here?** [year E.C.]	Where did you live before? (region) [1- Gambela, 2 - SNNP, 3- Orom, 4- Amhara, 5 - Addis, 6- Tigray, oth pls write]	Woreda [1 - Abobo, other pls write]	If lived in Abobo, ask Kebele [otherwise put "-1"]	**Why did you move here?** (1- business opportunity, 2- family was here, 3 - 1&2; other pls specify)	When did start the business [Year E.C.]

Employment											
How many people are working here? (total = family + hired) - 2003 EC)	hired	1 year ago (2002 EC) [total]	hired	5 years ago (1998 EC) [total]	hired	How much money do you make in one day (average) ? (2003) [Birr]	1 year ago (2002 EC)	5 years ago? (1998 EC)	**How much of that money, you need to cover costs (in one day)?** [Birr]	1 year ago	5 years ago?

Change	Capital	Business climate			Impact of Investment		Comment
If it changed, why? (1-change in prices for supply, 2 - more people buy, 3- people buy more (richer), 4- higher wage level (need to pay more), 5 - higher rents, other - pls *write answer]*	**Where did you get the capital from to start the business?** [1- bank, 2 - family member, 3- own savings, 4 - money lender, 5- friend, other pls specify	**How would you describe the current business climate in Abobo town?** [1- very good, 2- good, 3 - normal, 4 - not so good / risky]	**Why?** [pls write what is good or bad?	**Did you change the focus of your business in the last five years?** (e.g. Selling other goods, etc.) [pls write down, put year E.C.]	**What impact did the investments in the area have on your business?** [1- very positive; 2 - positive, 3 - no impact, 4 - negative]	**What is the mayor change / impact?** [pls write down?]	*In case smth to note on the interview, business etc.*

Note: Household Survey available on request (due to length not copied here) ph.baumgartner@gmail.com

Contacts of field assistants in both countries – for future research available upon request.

7.7 Appendix G: Parts of the thesis published in journal, book and conference paper

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Impacts of Large-scale Land Investments on Income, Prices, and Employment: Empirical Analyses in Ethiopia

PHILIPP BAUMGARTNER [a,b], JOACHIM VON BRAUN [a], DEGNET ABEBAW [c] and MARC MÜLLER [a,*]

[a] *University of Bonn (ZEF), Germany c-Ethiopian Economics Association, Addis Ababa, Ethiopia*
[b] *International Fund for Agricultural Development (IFAD), Rome*
[c] *Ethiopian Economic Policy Research Institute, Addis Ababa, Ethiopia*

Abstract. — We review the trend and types of large-scale land transaction in Ethiopia since 1992 and assess the impacts of one such investment using four scenarios: (i) a baseline scenario; (ii) the forest loss resulting from the land transfer; (iii) the operation of the investment at full scale; and (iv) an alternative scenario of a smaller investment paired with a more inclusive rural development policy. Results showed that forest resources are important for the rural poor, but that losses can be offset by gains from employment generation and business opportunities. The alternative scenario indicated opportunities for better social and environmental sustainability.

Key words — rural development, agricultural labor markets, land rights, land markets, Ethiopia, Africa

1. INTRODUCTION

Since food prices peaked in 2007–08, increased acquisition of farmland by foreign investors has been documented in many countries (Cotula, Vermeulen, Leonard, & Keeley, 2009; Deininger *et al.*, 2010; von Braun & Meinzen-Dick, 2009). Other drivers contributing to increased interest in farmland acquisition include the tightening of factor markets in Asia and increased demand for food in parts of Asia and the Middle East. This has stemmed from population growth and rising income levels, leading to dietary changes as well as an improved business climate in many countries of the Global South. According to data presented by The Land Matrix [1] (Anseeuw, Wily, Cotula, & Taylor, 2012) East Africa experienced the most land transactions involving foreign investors during 2000–11.

Ethiopia has seen a significant rise in the number of large-scale land acquisitions (LSLAs), and has earmarked an area of over three million hectares (EIA, 2011). A sub-set of these LSLAs will lead to "large-scale agricultural investments" (LSAIs), i.e., investment in the land is made to cultivate it as a farm. The remaining share of acquisitions might or might not be developed in the future. Until recently, agriculture in Ethiopia has been heavily dependent on smallholder production, with commercial farms producing less than 5% of the country's total agricultural (CSA, 2009). The impacts of the recent LSLAs on the economic status and livelihoods of local populations, however, are not well understood. Currently there is only limited evidence of the local impacts of LSAIs and information on country-level trends and patterns are scarce.

In principle LSLAs and subsequent LSAIs can have both positive and negative impacts on the economic status and livelihoods of local populations. [2] For instance, they can contribute to poverty reduction and the improvement of local livelihoods by generating local employment opportunities (Otsuka & Yamano, 2006). LSAIs can also stimulate agricultural commercialization and possibly benefit rural populations in several ways: by stimulating rural economic growth; by creating employment opportunities (depending on the labor intensity of cultivation methods); by increasing agricultural labor productivity; and by improving local food supply and nutritional status (von Braun & Kennedy, 1994). Finally, given that there has been comparatively little investment in agriculture—private or public—in many countries of the Global South during the past two decades, greater investment in agriculture is needed to meet increased global demand for agricultural produce (HLPE, 2011). Apart from these potential gains, investments in large-scale commercial agriculture may exacerbate the difficult conditions under which smallholder farmers often operate by depriving them of access to land or causing environmental degradation and pollution. Such negative impacts could contribute to increased poverty, food insecurity, and/or social marginalization (Borras & Franco, 2012; Bues, 2011; Guillozet & Bliss, 2011; HLPE, 2011; Smaller & Mann, 2009).

An assessment of LSAIs in six countries found that they have often led to conflict and social unrest (Schoneveld, German, & Nutakor, 2010). One case study of an early stage project in a densely populated part of Ethiopia found that income and food security were negatively affected after households had lost grazing rights on rangeland acquired by the investor (Shete & Rutten, 2013). Another case study of an established palm oil plantation in Ghana showed that impacts changed with distance from the site, the origin (migrant *vs.* local) and educational status of the household head, and the degree of household integration into the local economy (Väth, 2013). In a study on LSAI contract farming arrangements in Malawi, Hermann, Grote, and Büntrup (2013)

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2.7

Change in trend and new types of large-scale investments in Ethiopia

Philipp Baumgartner

Introduction

International investors have acquired farm land abroad with increasing speed over recent years, the trend being furthered by the food price crisis in 2007–8. Other factors contributing to an increased interest in extension of agricultural production include the tightening of market constraints in Asia; and increased demand for food due to population growth and rising income leading to a change in diet as well as improved business climate in many countries of the South. Several research teams have attempted to trace the current new wave of large-scale acquisitions of farmland abroad (von Braun and Meinzen-Dick 2009; Cotula et al. 2009; Deininger et al. 2010; Anseeuw et al. 2012). Owing to lack of transparency within the process of land deals or available information from recipient governments, access to reliable and comprehensive data remains a major issue of concern. Consequently, the analyses of country-level trends and patterns of large-scale investments are scarce.

Sub-Saharan Africa as a continent has the large number of foreign land investment projects.[1] East Africa as a region has proved to be very attractive for investors. Ethiopia, among other countries, has to date leased out significant areas to foreign investors, providing an excellent case study of the process. Despite much media attention on a few large international cases, reliable discussion on the extent and nature of the deals, their institutional arrangements and regional distributional pattern is missing.

This chapter will help closing this gap, in using available data on the history of investments licences and information on size and distribution of planned projects across the country. First, using information about the investments in the agricultural sector for the past two decades, the chapter will help answer the question: *Is the current trend in large scale investments structurally different from past investments?* In addition to this time-bound question about trends, the chapter examines patterns among the existing and planned investments, looking at their country of origin, location within Ethiopia and size characteristics. The chapter will therefore answer the additional question: *What type of investments can be observed in Ethiopia?* Findings of both research questions shall be discussed regarding their robustness and how they fit into the broader discussion on large-scale agriculture production and land deals in Ethiopia.

Paper presented at UNU-WIDER Conference September 19-21, Helsinki

Can large-scale agro-investments serve as an engine for inclusive growth? Empirical evidence from Uganda & Ethiopia

By Philipp Baumgartner (pbaumgartner@uni-bonn.de)[1]

Abstract: *Using a case study analysis of one old and one early stage large-scale commercial rice farm in East Africa, I examine the poverty impact on local communities. The impact is analysed along five impact channels. A combination of ex-ante simulation and ex-post institutional analysis is applied. Results show a mixed picture, with some potential poverty-reducing effects.*

JEL-classification: *Q1; D63; O13; C63;*

Keywords: *Rural development, Poverty reduction, Large-scale agriculture production, Africa*

1 Introduction

Since the price spike in global food and commodity markets in 2006/07 increasing commercial investments in large-scale agriculture production could be observed across the globe. While such large-scale land acquisitions (LSLAs) are not necessarily a new phenomenon, the extent and speed of acquisitions by foreign and domestic investors makes this ‚wave of investments' an interesting object to study (Deininger et al., 2010; von Braun & Meinzen-Dick, 2009).[2]

Investments targeting rural areas are desirable and feared at the same time. Proponents argue that they can serve as a type of ‚big push' to kick-start growth in remote, rural areas, create employment opportunities, bringing about technological change and improve links to regional and international markets through better infrastructure. Critics highlight the danger of depriving legitimate user of their land rights, causing environmental damage and potentially deteriorating local population's situation in terms of income, food security and resilience (Cotula, Vermeulen, Leonard, & Keeley, 2009).

The objective of the paper is to analyse, if LSLAs do trigger growth in the direct geographic proximity and whether this growth can be considered inclusive. A case study approach is used, to analyse how one investment affects local population's livelihood situation across five main impact channels. These impacts are analysed using one early stage investment to capture changes caused at the implementation, and one already well established case, to see long-term impacts. The five channels identified are (i) Land, (ii) Labour, (iii) Natural Resources, (iv) Technology, and (v) Institutions. Access to and value of the first three factors of production are assumed to change quickly, while the latter two are only slowly changing.

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[1] Corresponding author: Philipp Baumgartner, Center for Development Research | Zentrum für Entwicklungsforschung (www.zef.de), University of Bonn, Germany.

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[2] LSLAs considers an acquisition, including rent, or an area of 500 hectares or more.

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