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Water Grabbing and the Role of Power: Shifting Water Governance in the Light of Agricultural Foreign Direct Investment

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ABSTRACT: In recent years, the trend for foreign actors to secure land for agricultural production in low-income countries has increased substantially. The concurrent acquisition of water resources changes the institutional arrangement for water management in the investment areas. The consequences of 'land grabbing' on the local water governance systems have not so far been adequately examined. This paper presents an institutional analysis of a small-scale irrigation scheme in Ethiopia, where foreign and national horticultural farms started to use water from an irrigation canal that was formerly managed as a user-group common-pool resource by local smallholders. The study follows a qualitative case-study approach with semi-structured interviews as the main source of data. For the analysis we employed the Common-pool Resource Theory and the Distributional Theory of Institutional Change. We found that the former management regime changed in that most of the farmers' water rights shifted to the investment farms. We found three key characteristics responsible for the different bargaining power of the two actor groups: dependency on natural resources, education and knowledge, and dependency on government support. We conclude that not only the struggle for land but also the directly linked struggle for water is led by diverging interests, which are determined by diverging power resources.

KEYWORDS: Water grabbing, power resources, water rights, agricultural foreign direct investment, Ethiopia

INTRODUCTION

The rush for farmland commonly criticised and qualified as 'land grabbing' is not a new phenomenon and has its own history (Deininger and Byerlee, 2011). However, the scale and speed at which large-scale land acquisitions take place nowadays, together with the often occurring negative impact on the local population, have attracted massive media and public attention (Zoomers, 2010). Due to rising food prices, bioenergy policies, and population growth, demand for arable land and its corresponding water resources has risen dramatically (GTZ, 2009; The Economist, 2009; von Braun and Meinzen-Dick, 2009; Deininger and Byerlee, 2011). Land acquisition has become a real strategic asset in investing.

Land per se is not always valuable from an investor's point of view. It needs to possess certain properties which taken together can turn land deals into lucrative businesses. Of course, the quality of land, such as fertile soils, vegetation and humidity, plays a primary role. Another crucial aspect is access to water resources. Water is the one important factor that can decide whether a region can be cultivated and, if so, with what crops. In some regions, there is no possibility of irrigation without access to water, and thus land investors would face high risks in drought periods. Thus, water plays a central role in these land deals (Smaller and Mann, 2009; Woodhouse and Ganho, 2011). Yet, it is hardly ever mentioned explicitly in review articles dealing with the reasons for the globalised rush for land, such as by Zoomers (2010) and Deininger and Byerlee (2011).

The link between agricultural foreign direct investments (FDI) on land and local water management systems is the focus of this paper. Many investment projects take place in areas where small-scale farming is practised at a low level of intensity with established arrangements for water management. Foreign investors as new users entering the arena are likely to undermine existing rights (Zoomers, 2010), including the existing water management system. Foreign investors and local water users are often highly unequal actors, and both seek water rights in terms of access, withdrawal, management, exclusion and alienation rights (Schlager and Ostrom, 1992). Since water is of vital importance for both the local population and the investors, this question of the redistribution of the cost and benefit streams of the existing and emerging property rights on water is crucial. We assume that the actors' bargaining power plays a key role in determining the outcome of the change towards a new institutional arrangement in the agricultural water sector.

Several organisations in the agricultural economics sphere have started to discuss the consequences of investments on local water rights (von Braun and Meinzen-Dick, 2009; FAO et al., 2010). However, an empirical investigation on the direct impact of agricultural FDI on the property rights distribution on water has been missing to date. Therefore, we concentrate on the characteristics, outcomes, and influencing factors of the change in the previously existing water management regime which results from investors entering the arena. We take the example of Ethiopia, which has become one of the hot-spot countries of current FDI (Cotula et al., 2009; Deininger and Byerlee, 2011).

The paper aims to answer the following questions: How does the governance of a smallholder irrigation scheme change when agricultural foreign investors enter the arena? How do the power resources of the various actors play a role in this shift of the governance system?

The study takes the example of a small-scale irrigation scheme in the central Ethiopian region of Oromia, where nine horticultural investment projects have been established and have started using the same irrigation system as the local farmers. The chosen case study area is the irrigation catchment south of the Belbela dam which is situated in Ada'a Woreda in the region of Oromia. We base our empirical material on a single case study, providing a typical exemplary case (Yin, 1994). Semi-structured interviews form the main source of data, with the analysis of textual data and direct observation as additional sources. Interviews were undertaken with 70 farmers from two communities, six investment farm employees, governmental officials at various administrative levels and scientists during 2 months of empirical fieldwork in 2010. All interviews with local farmers were carried out in the local language, Oromo, and transcribed and translated to English. For reasons of anonymity, the two communities interviewed are named 'village A' and 'village B'.

The paper is structured as follows. First, we provide a theoretical introduction to the role of power resources in land and water grabbing. Subsequently, we introduce the case study setting including general information on FDI and horticulture development in Ethiopia. We then present the results of the research, discuss them and draw conclusions.

THE ROLE OF POWER RESOURCES IN LAND AND WATER GRABBING

As Zoomers (2010) states, land policies are highly politicised issues and struggles for land will rarely lead to a win-win situation, and are often driven by diverging interests. Thus, the analysis of land and water governance systems necessitates the inclusion of social and political dimensions. Therefore, this study draws on the Common-pool Resource Theory, as well as on the Distributional Theory of Institutional Change (Knight, 1992). The latter provides good explanations of human interaction in the context of limited resources and resulting resource conflicts (e.g. Acheson and Knight, 2000; Theesfeld, 2004). We further conceptualise institutional change in the irrigation sector as being a direct or indirect consequence of the FDI on land. The new institutional arrangements show the outcome of distributional conflicts. We employ the concept of power resources as the central analytical category. We draw here on Theesfeld (2011) who conceptualised the institutional change in Bulgaria's water sector reform as a struggle among power-asymmetric actors. Sehring (2009) reports this for Kyrgyzstan

where the composition of the water user association councils reflects existing local power asymmetries. While the study of power relations focuses on the interactions of the involved actors and is therefore process-oriented, the study of power resources is result-oriented. The concept of power resources explicitly allows for the identification of the very factors that lead to unequal bargaining power resulting in asymmetric distributional outcomes (Knight, 1992). Actors may possess several resources, but only certain socio-economic or biophysical contexts may lead to a situation where these resources turn into power resources and can be used as a lever in a bargain to reach personal benefits.

The study of power resources is central to the Distributional Theory of Institutional Change (Knight, 1992, 1995), which focuses on the power asymmetries of actors as the main determinant of institutional change. Thus, institutional change is a "by-product of substantive conflicts over the distributions inherent in social outcomes" (Knight, 1992). According to Knight, the bargaining power of the actors is a function of their resource provision. We will show here how the asymmetries of power resources between the local farmers and the investment farms in the end facilitate the capacity of strategic actors, here the investment farms, to determine the content of the detailed rules for the new association locally managing the irrigation sector, ranging from time scheduling of water withdrawals to sanction mechanisms. Following the application of the theory to natural resources management cases (Toufique, 1997; Acheson and Knight, 2000; Theesfeld, 2004), we will concentrate on a selection of power resources which turned out to be decisive in our case and which we can underline with the empirical study. These are: capacity to take risk, time preference, exit costs, positional power, network power, sanction power and information and knowledge. We did not particularly focus on the power resources credibility of an actor (Knight, 1995), organisability of a group (Knight, 1992) and joint mental models (Schlüter, 2001), which can as well be found in the literature, but which would require additional empirical investigation which we did not conduct in the frame of this study.

Exit costs are the costs that arise for actors when bargaining is either lengthy or ultimately unsuccessful (Schlüter, 2001). Capacity to take risk and time preference is closely linked to exit costs. It is, to a large extent, determined by the actors' available resources: if actors are not dependent on an immediate outcome of the bargaining because they possess enough resources, they have a high capacity to take risk and a low time preference. Bargaining is expensive and those actors with more patience, i.e. with a lower time preference, have advantages in the bargaining process (Knight, 1992). Positional power and network power provide members with information and reduce transaction costs for specific interactions, depending on the type of network. Positional power refers to the position that allows for certain actions. A special form of positional power refers to the positional power of existing networks, such as the former communist elite in post-socialist countries (Theesfeld, 2011). Sanction power refers to the threat of sanctions imposed by one actor on another in the case of non-compliance. This threat influences the bargaining situation of the threatened actor to the benefit of the threatening actor: that is, under the threat of sanctions for non-compliance, compliance with the rules becomes a rational long-term strategy (Knight, 1992). Information asymmetries influence an actor's valuations of the individual alternatives, hiding institutional alternatives or adding new alternatives (Knight, 1992). Schlüter (2001) and Theesfeld (2011) call for the expansion of the variable information to the notion of knowledge, which comprises information and skills.

AGRICULTURAL FDI IN ETHIOPIA AND THE OROMIA REGION

Agriculture is the main source of livelihood and the main pillar of the Ethiopian economy, contributing approximately 43% of gross domestic product (GDP) (years 2008/2009), 86% of foreign currency earnings, and 85% of rural employment (EIA, 2010). Most of Ethiopia's cultivated land is under rain-fed agriculture, with smallholder subsistence agriculture accounting for 85% of overall employment (MoWR, 2002). Hydrological variation, recurrent floods and droughts, as well as a lack of mitigating strategies such as water storage facilities, lead to frequent crop failures and to most farmers producing only one crop per year (Awulachew et al., 2007). Being vulnerable to the variability in water availability

contributes to food insecurity in Ethiopia (World Bank, 2006). From 2005 to 2007, 41% of the total population was undernourished, as compared to a ratio of 28% for sub-Saharan Africa as a whole (FAO, 2010). By the end of 2009, 6.2 million people were in need of emergency food relief (WFP, 2010), and cereal food aid imports accounted for 650,000 tonnes (FAO and WFP, 2010).

Paradoxically, many poor African countries, including Mozambique, Sudan, Madagascar and Ethiopia, are key recipients of FDI (Cotula et al., 2009). Ethiopia, in particular, has become one of the most important target countries for agricultural FDI. The estimated land area assigned for agricultural FDI differs according to the source, from 500,000 hectares (ha) between 2009 and 2010 (Dessalegn, 2011) to 2.3 million ha between 1991 and 2010 (Possemeyer, 2011).

FDI into the Ethiopian agricultural sector constitutes 32% of the overall inflow of FDI to Ethiopia, with most of the investors coming from the European Union (EU), India, Israel, Saudi Arabia and the United States (US) (Weissleder, 2009). Two main investment periods of FDI to Ethiopia can be identified. From 2000 to 2005, the main investment flows occurred in the horticulture sector, with the EU, India and Israel investing more than 60% of their total FDI to Ethiopia in this sector. From 2006 to 2008, investments in horticulture almost doubled, but investments in the food, meat, vegetable and biofuel sectors also increased dramatically (ibid.). FDI into the horticulture sector at present constitutes less than one-third of all the agricultural FDI into Ethiopia (ibid.).

Two factors make Ethiopia favourable for commercial investors in horticulture. First, only 30% of the country's arable potential is being used for crop cultivation (MoWR, 2002) and Ethiopia is well endowed with water resources, despite their variability (World Bank, 2006). This suggests a high potential for the expansion of agricultural crop production. Second, since the early 2000s, a clear strategic policy shift from the focus on smallholder towards large-scale commercial agriculture can be observed in various policy documents such as the poverty reduction plan of the Ethiopian government (MoFED, 2006), the strategic growth plan for the period 2010 to 2014 (MoFED, 2010) or the 'Rural Development Policy and Strategy' (MoFED, 2003). The latter speaks of a 'role change' occurring in the agricultural sector: "the key actor in the sector's development will be relatively large-scale private investors and not the semi-subsistence small farmers" (ibid). The document sets out further that both the development of vast areas of land with high irrigation possibilities and the production of high-value horticultural products (such as flowers and vegetables) are central investment opportunities. Alongside such policy documents, direct investment incentives are in place, such as custom duty exemptions or income tax exemptions for foreign investors (EIA, 2010).

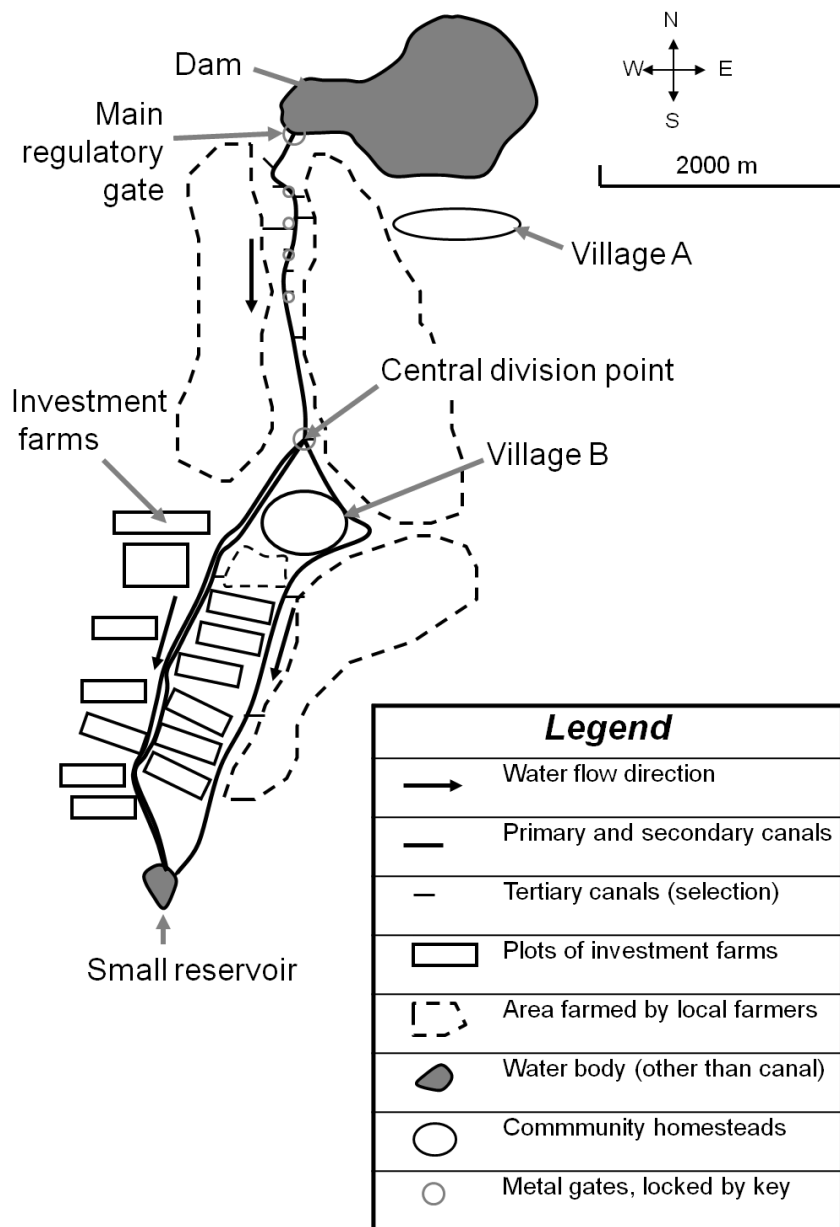
The case study focuses on a small-scale irrigation scheme in the administrative region of Oromia. Out of the 11 regions of Ethiopia, Oromia received the highest share of foreign horticultural investments (Weissleder, 2009). As in most rural areas of Ethiopia, agriculture is the predominant source of livelihood. With smallholder agriculture being predominant, Oromia offers conditions that are typical of African countries that face agricultural FDI. The average holding size of the local farmers is below one hectare, and this area might even be distributed among different plots (OWRB, 2008).

Biophysical attributes of the irrigation scheme in the study site

Biophysical attributes and material conditions determine and shape what actions are physically possible and how actions shape the outcomes of the setting (Ostrom, 2005). The irrigation scheme under study is situated in the central highlands of Ethiopia. The average annual rainfall is 815 mm, and the temperature ranges from 10.5 to 25.4 °C (Girma and Awulachew, 2007). The scheme was built in the 1980s and consists of two dams and a corresponding canal structure. The whole irrigation scheme was intended to provide an irrigation area of 1600 ha, out of which 500 ha were designated for a state-owned farm producing vegetables and fruits, while the rest was intended for smallholder irrigation (OWRB, 2008). The state-owned farm was only operational for some years, after which parts of the land were given to smallholders, with the rest remaining unused. As the focus of this paper is the interaction between FDI and local farmers, this study focuses on the southern part of the irrigation system

(depicted in figure 1), where investors were allocated land in 2005. The southern dam, the Belbela dam, has a storage capacity of 12 million cubic metres per year and feeds on the northern dam, which has a capacity of 15 million cubic metres and is used by four farmer communities. According to local authorities, the storage capacity of the Belbela dam will be sufficient to develop an area of 1250 ha (OWRB, 2008). However, given the fact that the dam is heavily silted and most parts of the canals are damaged and need major maintenance, the actual irrigation capacity is severely reduced. According to local authorities, the total actually irrigated area amounts to 262 ha only. The mainly international horticultural investors were allocated approximately 140 ha from both the unused area of the former state farm and from local farmers. According to local information, the latter were granted compensation, but no consultation prior to the investment took place. The canal water in the irrigation scheme has since been shared among these actors. As the investment farms were allocated land from the former irrigated area, the total irrigated area was not increased.

Figure 1. Sketch of the irrigation scheme.



However, investors used water more intensively than the small-scale farmers. This led to an overall increase in canal water scarcity since 2005 when the investors settled in the area, resulting in conflicts between investors and local farmers as discussed below. Figure 1 depicts the irrigation catchment area and the location of the canal. The source of the canal water is the Belbela dam situated in the northern part of the canal system. A gate at the dam is used to control the water flow into the primary canal leading southwards to local farmers and investment farms. At the central division point, the primary canal is re-partitioned into two secondary canals: one leads eastwards to village B and the villagers' corresponding fields, and the other southwards to the investment farms. Investment farms and village B thus share the outflow of the central division point, while village A is situated upstream of both. The secondary canal leading southwards is divided into two canals, one on the right and the other on the left side of the road. The canal on the right side of the road is shared between investment farms and adjacent farmers from village B. The canal on the left side is used only by the investment farms. The secondary canals all end in a small reservoir.

Although it is physically possible to extract water from the whole canal system, since it is an open concrete lining system, farmers use irrigation water only from tertiary canals, some of which can only be opened by using a specific key which only the water guards have.

Main actors

This section characterises the water users (investment farms and local farmers) and their rules irrespective of any interaction. Not being a direct water user, the government is represented in the local area by extension workers and by a government-supported and -controlled water enterprise, which started operation in 2008 with the mandate to take over the management of the irrigation. Its main task is to carry out the laws decided upon on the regional and local level and it has explicitly been requested by local authorities to resolve the ongoing water conflict between the investors and the farmers, distribute water equally among all users without discrimination, and investigate how equal water distribution among all users is theoretically possible. The water enterprise is represented by an individual who has previously been a governmental extension worker in the area.

In the area under investigation, nine horticultural farms have been established since 2005. As mentioned above, they have been assigned a share of land from the former state farm and from local farmers. Five are entirely owned by foreign investors: two from the Netherlands; one from Israel; one from the Palestinian Territories; and one from China. Two of the farms are organised as joint-ventures between Ethiopian and foreign investors (Russian/Ethiopian and Israeli/Ethiopian), and two farms are solely Ethiopian. Of the nine farms, three are not fully operational owing to financial difficulties. The average farm size is 20 ha. Six farms are directly situated along the canal system, depicted in figure 1.

All of these farms irrigate their greenhouses and open fields year-round. Water needs for irrigation and the operation of farm activities are met by borehole-extracted groundwater, and only to a smaller degree by canal water. Most of the farms use substantially more groundwater than canal water. Using canal water, however, is considered important because of its relatively higher quality and cheaper price. Groundwater contains a high percentage of bicarbonates and is treated and mixed with canal water before being used. One of the horticultural farms uses canal water directly for irrigating its open fields, while all the other farms have one or more reservoirs on their compound, which are filled by canal and groundwater. The irrigation techniques used by horticultural farms differ. While some outdoor horticultural producers only use drip or spray irrigation, most of the horticultural farms use additional computer-driven water regulation to steer humidity in their greenhouses. Furthermore, many of the horticultural farms have established a water recycling system.

In the case study area, farmers from villages A and B use canal water for irrigation. Farmers from village A represent upstream water users. Members of village B, on the contrary, compete directly with the investors for irrigation water. However, irrigation-water needs and drinking-water needs cannot be

considered separately here. Neither of the communities has access to clean drinking water. Village A uses drinking water primarily from the Belbela dam, while village B uses canal water for drinking.

The small-scale farmers irrigate their fields only during the dry season, from September to May. The prevalent irrigation techniques are simple flooding of the fields and watering by hand using a can. The major crop types in the rain-fed season are wheat (46%), teff¹ (40%), and pulses (13%) (OWRB, 2008). The use of irrigation allows for a second harvest and crop rotation. Under irrigation, the major types of crops are onion, tomato, potato and chickpea. Furthermore, irrigation and the fertile soil enable many farmers to produce an agricultural surplus and sell it on the nearby local market. This contributes to food security in the area. Tesfaye et al. (2008) found that approximately 70% of the irrigation users were food-secure, whereas only 20% of the non-users were food-secure. Food security was also found to be highly seasonal, the time of food shortages starting in June at the same time as the start of the rainy season, and lasting till November, which is the start of the harvest season.

CHANGES IN THE WATER GOVERNANCE SYSTEM

In this section, we compare the water governance system for canal irrigation before and after the establishment of the investment farms in 2005. Also we look at actual behaviour while taking turns at irrigation, which may deviate considerably from the formally established rules.

Water governance system before the foreign investments

Before the investment farms settled in the area in 2005, the local farmers devised their own operation and maintenance rules for the irrigation system with almost no government involvement. By area, all water users were organised in groups of 15 to 40 farmers, each with a committee consisting of a chairperson, a cashier and a secretary. The formation and structure of the user groups were completely left to the farmers themselves. They were formed mainly by social ties and geographical position. In one village, the first user group started with the initiative of a farmer with an educational background in irrigation management and soon, other user groups followed. According to local information, no general agreement between the user groups of the different villages regarding the use and maintenance of the shared infrastructure existed. Farmers reported that because of the abundant water situation, no formal agreement between the user groups of the two villages was necessary. As for maintenance, each user group cleaned their part of the canal, but this was again not formally agreed upon.

Governmental involvement in water management only took place in the form of the governmental extension workers who regularly advised the farmers on irrigation techniques or agricultural practices. In general, the government was more represented in land issues in that all farmers needed to pay land taxes. Effectively, in order to acquire canal water rights, a farmer needed to pay the land tax to the government or rent land from another farmer, become a member of a group, and abide by its rules. Rules included 'to use water by turn', 'to use water properly', and 'to attend meetings'. 'Proper use' of water meant using appropriate amounts of water, not to waste water, not to flood adjacent fields, and to alert the water guard if the canal became over-flooded. Water guards are local farmers paid to open and close the metal gates upon request using a specific tool. The user group situated next to the canal operated the outlet into the primary canal. Farmers reported that although there was no formal agreement between the user groups, this usually worked well.

The question of who controls water resources is therefore not only determined by the upstream/downstream setting, but also to a large extent by the question of who is able to make the water guards open the gates. Maintenance activities such as cleaning the canal were done collectively

¹ Teff (*Eragrostis tef*) is an annual grass and a major Ethiopian staple food crop.

and all decisions were taken in the group meetings on a democratic basis. Before the start of the irrigation season, each group assembled and voted for the rules for the following season.

All the groups in village A and some of the groups in village B raised water user fees. Like the other operational rules, the farmers decided this in their group. The fees were collected by the farmers' committees. In village A, all interviewed farmers stated that they paid 20 Birr² per hectare of land annually. No metering device existed and so the charge was paid irrespective of the actual amount of water consumption. The water charge was used for repairing the canal, paying the water guards, and for buying materials for administrative meetings, such as writing pads for the committee. Unlike in village A, not all groups in village B imposed user fees on their members. Yet, most of the groups implemented sanctions for non-compliance to the rules 'use water by turn', 'attend the meetings' and 'use water properly'. However, in both communities, these rules were rarely executed, flexible, and depended on the situation, which is in line with the graduated sanctioning mechanisms described by Ostrom (1992). In table 1 below, we summarise and discuss the fines before and after the set-up of the investment farms.

In general, water resources in Ethiopia are vested in the state. The Ethiopian constitution declares public ownership of rural land and natural resources (FDRE, 1995), and the Ethiopian Water Resource Management Policy (MoWR, 1999) states that basic human needs shall have the highest priority in any water allocation plan. Apart from these policy documents, no legislative or formal regulation on water exists. Accordingly, neither investment farms nor local farmers reported any direct governmental regulation that they had to follow.

Changes in the water governance system

Since 2005 when the investors settled in the area, the institutional arrangements in the water sector have changed considerably. All interviewed parties confirmed that water scarcity had increased from the time the investment farms arrived in the area, for two main reasons. First, the investors entered the arena as additional, intensive water users, and second, the numbers of farmers using irrigation have increased. In the first 3 years of the investors' presence in the area, water conflicts between investors and local farmers started to emerge and became gradually more aggravated. On the one hand, investment farms employed their own guards to open and close the main regulatory gate at the Belbela dam, the tertiary canals and the central division point and, on the other, local farmers still worked with the guards paid by the user groups. The presence of these two different sets of guards led to direct conflicts at the gates. Farmers reported that 'hostility' and fights over water had started during this period. Investors stated that the water supply had been highly irregular and unreliable.

When the situation worsened, one of the horticultural farm managers took the initiative to set up a new association consisting of representatives from the investors and local farmers dealing with the management of the whole irrigation scheme, as depicted in figure 1. The main purpose was to resolve the conflict over water and organise the maintenance of the canal system (such as cleaning and repairing). The new association's leading body comprises a chairperson, his assistant, a programme coordinator, and a person in charge of the finances. Eventually, an employee of the water enterprise which is supported and controlled by the government became the chairperson. This same person had also been an extension worker prior to his new position and was therefore known to local farmers as a government representative. The chairperson's assistant is an employee of the investment farm which initiated the setting up of the association. The chairperson works closely together with the programme coordinator, who, as head of the farmers' user groups, represents the farmers' side in this leading body of the association. He is in charge of carrying out the practical decisions of the association, such as communicating the arrangements of water turns to the guards and to local farmers. The programme coordinator and the chairperson are the main contacts for the farmers. As stated above, both were

² 20 Birr = approximately US\$1.20.

familiar to the local farmers, since the programme coordinator was a farmer himself and the chairperson had worked as an extension worker in the region. The association also employs and pays for four water guards, two at the central division point and two at the Belbela dam, who receive orders from the association to open and close the canal gates. In fact, they have replaced the water guards employed by the local farmers and the individual guards employed by single investment farms.

The association regularly calls for meetings. These meetings are attended by several representatives from the investment farms and two farmers per village as representatives of all farmers' user groups of that village. However, the chairperson of the association reported that it was only rarely that all farmers and all representatives from the investment farms participated in the meetings of the association, owing to work commitments. Although the association is neither organised nor actively supported by the government, the fact that the chairperson is also an employee of the government-supported water enterprise turns out to be a power resource, as will be discussed later.

Soon after the association was formed, several changes to the organisation of water use and management were implemented. The fact that the chairperson of the association holds several positions led many local farmers to perceive most of the changes as the government's intention, and not a decision made by the association in which they are in principle represented. The following changes occurred:

Reorganisation of the farmers' user groups

The existing user groups in each village were reorganised into smaller entities with lower membership. Each water user group elects five committee members for its own group. The committee members of all groups then elect two members from among themselves to join the meetings of the newly created association as farmers' representatives. The user group committees were assigned a two-pronged key role in the activity of the association. First, they act as a communication link between farmers and the association: if farmers want to address the investment farms, they are supposed to contact their user group committees. Second, the committees have the mandate and the instruction to collect the water user fees and the fines for non-compliance, and transfer them to the association (see below). As before, each group has a set of rules determining, for instance, the irrigation schedule and the maintenance work contribution. But unlike before the foreign investments, these rules must now be in a written form and signed by all water users prior to the irrigation season. As regards the devising of the rules, local farmers participate actively in the process of finding an agreement for the group and in the general selection of the rules, with neither the government nor the association being directly involved. However, the new association has influenced the rule enforcement mechanism by telling the user groups to introduce or raise the level of sanctions in case of non-compliance. The other rules, however, are similar to those that had previously been in place.

Introduction or standardisation of water use charges

The association introduced water use charges for investment farms (120 Birr per ha per year) and uniformly raised the charges to 40 Birr per ha per year for local farmers. The charge is paid per hectare per year, irrespective of the quantity of water used. Water use charges are still collected by the farmers' committees but are now transferred to the association rather than remaining with the farmers' committees as happened previously. According to the assistant chairperson of the association, the money raised is used for paying the water guards and the programme coordinator. When asked why the water charges for farmers were raised specifically to 40 Birr per ha per year, he stated that it was more to 'test the loyalty' of local farmers to the association than to raising a 'real' water charge.

Representatives of the association clearly affirmed that these water payments are collected and imposed by the association, and not by any government agency or the water enterprise. Government representatives were not aware of the collection of water use fees in the area. When asked about water payments, two governmental extension workers stated that farmers paid for neither water nor

water management. Furthermore, a government official from the local government agency responsible for water management in the area said that the water enterprise had not started yet and that the collection of the water fees would start 'next year', in 2011. Irrespective of these statements, most farmers were still convinced that the collection of water fees originated from the government.

Substantial increase in sanctions

As already discussed, before the association was set up and the structure of the farmers' user groups changed, many user groups had already implemented fines for non-compliance to some or all of the agreed user group's rules. With the reorganisation of the user groups, the new association informed them to introduce fines for non-compliance (if not already present) or raise existing fines substantially. For the investment farms, however, no such penalties were implemented. As with previous changes, local farmers were convinced that this change was the government's intention, and reported that the previous system whereby an initial warning in cases of non-compliance was used had changed to a system where no warning was issued and the penalty was considerable. Table 1 also depicts the increase in fines for breaking the rules 'use water when it is one's turn only', 'use water properly', and 'attend group meetings'.

In village A, farmers reported being told by the new association leaders to increase the fines to 75 Birr in the case of members using water outside their turns, while in village B, farmers stated that they were only asked to raise the fines in general. The farmer representative of the association (the programme coordinator) who is also the head of the farmers' user groups also suspected that the government was behind this: "[t]he current punishment is very serious. I think the association received the order for this serious punishment from the government. We must accept everything which comes from the association, whether it is a punishment or a new rule". This statement reflects the farmer representative's feeling of not being equally respected in the meetings of the new association. He is reported to have voted against some of the imposed rules, but "they do not accept my opinion. All the members do not have veto power".

Set-up of a water rotation between the investment farms and local farmers

Based on the initial aim of settling the conflict between the two types of water users, local farmers can still decide whose turn it is among themselves. Yet, since the year the association was created, the basic initial rule has been that investment farms may use the canal water for 3 days per week, and local farmers for 4 days a week. This arrangement did not work because of the constant rule-breaking by both groups, such as urging the gate operators to open the gates or opening some of the small tertiary canals that can be opened by hand. Another rule was thus enacted, leaving the days to local farmers and the nights to investment farms. This rule, again, is not fully respected, as will be further discussed later. As with the other changes, local farmers perceived the government as being behind this change.

Reorganisation of canal maintenance

The association also reorganised the cleaning schedule of the canal. The investment farms clean the canal from their farms to about 200 m south of the Belbela dam, while local farmers from village A have to clean the last part of the main canal and their small canals. Farmers from village B have to clean their small canals up to the central division point. The association also organises the time of cleaning and requests a workforce from both sides when maintenance activities are considered necessary.

Regarding the new institutional arrangement for irrigation water, different rules and sanctions were put in place for local farmers and investment farms (see table 1). For local farmers, five rules were in place, and three of them were sanctioned in case of rule-breaking. The investment farms, however, only had to follow three rules and violation was not sanctioned. Rule-breaking was reported on both sides. Several farmers stated that they themselves had broken the rules, and consequently had to pay

the fine. A number of investors admitted to only abiding by the first rule, which is to pay the yearly water fee, and not to following the agreed system of turns. Most of the farm managers stated that they use the canal water when they need it and as soon as it is available. One farm manager stated that "of course" they used canal water to fill up their reservoirs even if it was not officially their turn, and there was "no other possibility".

Table 1. Binding rules and sanctions for investment farms and local farmers.

Rules	Local farmers		Investment farms	
	Before the set-up of the new association	After the set-up of the new association	Before the set-up of the new association	After the set-up of the new association
Pay the yearly water fee (in Birr per ha)	Village A: 20 Village B: 0; 20; 40*	40	-	120
Respect the turns (sanctions in Birr)	Sanction: Village A: 5-10; 30-40* Village B: 30-50	No sanction	-	No sanction
Use water properly (sanctions in Birr)	Sanction: Village A: 50 Village B: 5-10; 30-50*	Sanction: 150	-	-
Attend group meetings (sanctions in Birr)	Sanction: Village A: 0; 5; 10; 20-30* Village B: 0; 5-10; 10-20	Sanction: 200-250	-	-
Attend the meetings of the new association		Only for representatives No sanction		No sanction

*Farmers reported different ranges of sanctions, according to the different user groups.

As regards the efficacy of the association in its aim of providing a platform for common agreements between investment farms and local farmers, the latter did not feel equally represented in the association. Many of the farmers interviewed expressed a sense of being powerless with regard to the association's decisions. The main farmers' representative in the association expressed a feeling of being at the mercy of the new association's decisions, and stated that he did not know the aim of "this committee".

In addition to these changes that occurred as an initiative of the new association, local farmers attributed other changes in the area to the set-up of the investment farms.

- Increase in water scarcity was reported as the most important.
- An increase in small-scale land rentals was reported. As mentioned above, the first investment farms were allocated land by the government, either from the former state farm or from local farmers, who were granted compensation. However, after the first investment farms were settled, land commercialisation continued without government involvement and some

investment farms rented additional plots for cultivation from local farmers, who then migrated to the towns.

- The atmosphere in the farmers' user groups worsened after the setting up of the investment farms. "Respect and fraternity" changing to "hostility" were words used by interviewees.
- Many farmers complained about chemical inputs affecting workers' life in the investment farms, or harming their livestock.³
- Employment possibilities for the youth were mentioned as a positive consequence of the investment farms settling in the area.

Summary: How water rights changed

In general, water rights changed both directly and indirectly via the change in land rights. Regarding the direct change of water rights, acquiring water rights before the set-up of the investment farms was organised as follows: farmers needed land titles from the government, or to rent land from local farmers. Then they needed to join a water user group, sign the respective agreement and pay the water fee (if in place in that group). After that they could use the canal water for irrigation. After the set-up of the investment farms and the establishment of the new rules, 'access' and 'alienation rights' for water remained the same, but 'withdrawal', 'management' and 'exclusion' rights changed (Schlager and Ostrom, 1992): while the previous procedure for acquiring water rights persisted, farmers' withdrawal rights were constrained with the set-up of the rotation system with the investment farms, in addition to the rotation system among farmers themselves, the rise in sanctions, and the collection of water use charges by the association. Water management rights also changed. Previously, the cleaning of the canal was decided by the farmers' user groups, but now, the association decided on the cleaning schedule of the canal. Exclusion rights that formerly allowed farmers to exclude any user of the irrigation scheme no longer applied because farmers could not exclude the investment farms as new resource users. However, many of the water rights persisted among local farmers, such as decisions on the exclusion of farmers from the groups, or decisions on the rotation system among farmers in a group.

Water rights also changed indirectly with the change in land rights. Water rights in the case study area were tied to land rights in a way that farmers may have land without the right to water from the canal, but not vice versa. For those investment farms which were established on former local farmers' land, land rights changed and with this the access rights to the canal.

Apart from these changes in water rights, the execution of these rights also changed. Empirical material revealed a change in the execution of water withdrawal rights due to corruption and rent-seeking. After the set-up of the investment farms and the new association, key persons, such as the new water guards or leaders of the new association, were open to bribery. Local farmers were often not in the position to offer bribes and regarded themselves as disadvantaged in this regard.

RESULTING ACTIONS AND INTERACTIONS AFTER THE NEW INSTITUTIONAL AGREEMENT

In this section, we provide examples of actual behaviour and actions in the irrigation sector, describing the rules-in-use in the irrigation system which may deviate substantially from the formal rules described above. If people do not comply with the formal rules, this shows that they have other means of pursuing their strategies. The discrepancy between formal and informal rules is a good indicator of the appearance of power asymmetry among the actors, since it is a driving force for actions and decisions in the irrigation sector (Theesfeld, 2004). The actual rules provide hints about how power relations shifted and which actors hold the more powerful positions.

³ In spite of this aspect being very relevant, the focus of this study is on the quantitative impacts of FDI on water rather than on its qualitative aspects.

A typical action at the water canal in Ada'a Woreda is neglecting the formally agreed withdrawal schedule by blocking the water flow. Water inflow to many of the tertiary canals leading to farmers' fields can be substantially increased by putting mud and stones in the main canal. Thus, blocking the canal is a strategy commonly used by local farmers. Farmers from village A and village B who share the southern canal with the investment farms reported that they have sometimes blocked the canal during the dry season when water was scarce. The investment farms reported having taken counteraction: one farm manager explained that the formal rule in the case of canal blocking is to call the association which would settle the conflict. However, this procedure takes "too long", and therefore, the rule-in-use is that the farm manager sends workers to unblock and re-open the canals, but he admitted that this "only causes fighting". Another farm manager confirmed that "in times of water crisis", a farm guard is instructed to observe the canal situation and report back. This example shows that those farmers who are able to block or unblock the canal do have a distributional advantage. Certain power resources, such as money to employ a farm guard to keep watch or having enough workers to unblock the canal, make it easier for them to act in such a way. This is analysed further in the next section.

Another action in the irrigation system that shows the heterogeneity of the actors is their capability to use alternative sources of water. Investment farms mainly use borehole-extracted groundwater and are thus less dependent on the canal water and can easily compensate for a low level of canal water. In contrast, the small-scale farmers have no other source for irrigation but canal water. A low level of canal water has an additional impact on the villagers' drinking water needs. With a low water level in the canal, farmers from village A can satisfy their drinking water needs from the Belbela dam, while farmers from village B must use a river situated one hour's walk from their homesteads.

Influencing decision-makers is a third type of action revealing the actual rules-in-use. This implies bribing the water guards directly or bribing those who have power over the water guards. Both local farmers and managers of investment farms stated that these side-payments are "possible". When asked whether they also used this method to influence the water guards, farmers mostly denied it, referring to the small amount of money that they could offer, as compared to the financial possibilities of the investment farms. The farmers' representative in the new association who is in charge of conveying the association's decisions to the water guards reported that if the investment farms call him for more water, he asks the water guards to open the water gates for them, fearing sanctions from the association such as fines if he did not do so. However, when local farmers ask him for more water, he stated that he cannot do much: "We give to the flower farms when they ask us, whether it is day or nighttime, but we mostly can't give to the farmer". Several investment farm managers reported that direct side-payments to canal operators were common practice prior to the foundation of the new association. Now, some farm managers said that "some farms still do that" and another stated that in the case of canal water shortage, he had called the water guard directly and offered him money to open the water gate. However, all investment farm managers agreed that the usual procedure in cases of shortage in canal water was to call the chairperson of the association. This thus favours those with good personal contacts with the chairperson.

POWER RESOURCES AND WATER GRABBING

As indicated in the actual behaviours and actions above, the drivers of concrete actions are often the struggles for distributional advantages. We have shown that the institutional arrangement for water management changed considerably as a consequence of the new actors coming in.

The two main actor groups can be described best by three key characteristics: 'dependency on natural resources'; 'dependency on government support'; and 'education and knowledge' (see table 2). Drawing on the Distributional Theory of Institutional Change by Knight (1992, 1995) and its application to natural resources governance by Theesfeld (2011), we provide here a further application of the power resources mentioned in the literature. Each of our three key characteristics can be clearly linked

to power resources. The possession of these power resources turns out to be either high or low depending on which actor group a person belongs to.

Table 2. The three main characteristics of actors that impact on power resources.

Actor characteristics	Power resources (Knight, 1992, 1995; Schlüter, 2001)	Occurrence of power resource with local farmers	Occurrence of power resource with investment farms
Dependency on natural resources	→ Capacity to take risk	Low	high
	→ Time preference	High	low
	→ Exit costs	High	low
Dependency on government support	→ Positional power	Low	high
	→ Network power	Low	high
	→ Sanction power	Low	high
Education and knowledge	→ Information	Low	high
	→ Knowledge	Low	high
	→ Positional power	Low	high

First, dependency on natural resources differs significantly between the two actor groups. As previously discussed, local farmers used the canal water for their livelihood, including drinking water, water for livestock, irrigation, subsistence agriculture and production for the smallholder market. Investment farms met their water needs primarily from groundwater, while canal water was only used as an additional resource. As a result of their dependency on natural resources, local farmers had less capacity to take risks than investment farms, and had a higher time preference than investment farms. Bargaining is expensive and those actors with more patience, i.e. with a lower time preference, have advantages in the bargain (Knight, 1992). These two factors impact on the exit costs, which are defined as the costs that arise for an actor in cases where an agreement is difficult to reach or ultimately fails (Schlüter, 2001). In the first years of the investors' presence in the area (2005-2008), there was no common agreement in place. Each actor group employed its own water guards and conflict was pervasive. Because of local farmers' higher dependency on natural resources, this situation of no-agreement and widespread conflict was livelihood-threatening and thus more costly to local farmers than to the investment farms, resulting in higher exit costs for local farmers.

Second, dependency on government support is probably the most important factor in the study and is typical of the Ethiopian socio-political context. To assess the role of the government in the case study setting, a closer look at the general relationship between the government and the two actor groups must be undertaken. As a general policy in Ethiopia, foreign investment in agriculture is officially welcome and assisted in various ways. For the case study area, the investment farms were allocated land and given administrative support. Such extensive government assistance does not necessarily apply to rural farmers. On the one hand, rural farmers are supported by government extension workers and government services and, on the other, the relation between the government and rural Ethiopian farmers must be seen in a broader political context. In Ethiopia, the oppression and intimidation of opposition party members is a tragic but common fact. The harassment or arbitrary detention of those criticising the government is increasingly reported (Oakland Institute, 2011). As a consequence, there is an articulate culture of fear about government opposition, leading to a fear of showing dissent with government policies. Furthermore, many crucial services in the rural areas are government controlled.

Actual or suspected opposition to government can lead to being denied fertilisers, seeds or even healthcare services (Human Rights Watch, 2010; Amnesty International, 2011).

As mentioned above, many farmers think that the association's decisions originated in the government, as a result of the overlap of positions held by the chairman of the association. This contributed to the farmers' acceptance of the imposed changes, because of the general fear of opposing the government. The double role of the association's chairman, who was imposed by the investors, gives the investment farms relatively higher positional power and network power, as compared to local farmers. Likewise, the investment farms were able to exercise sanction power via the association.

Third, education and knowledge are important characteristics of the actors, since they are in line with the power-resources information and knowledge, which are emphasised in the literature dealing with such heterogeneous power resources of actors (Knight, 1992; Armitage et al., 2009; Giessen et al., 2009). While investment farm managers are highly educated and experienced in dealing with bureaucracy, most local farmers have only enjoyed basic education and have not gained experience in bureaucratic issues. Good knowledge of the administrative system also leads to positional power and allows better access to information, which is a key power resource stressed by Theesfeld (2011). Being educated and experienced enables investors to gather and process information in order to act strategically. Investment farm managers had detailed knowledge of their water consumption and on how water needs can be met, and also had information on the way farmers were organised and how they used water. Therefore, they were in a position to design a set of rules for local farmers that in fact furthered their own strategies. Local farmers, on the contrary, would scarcely have been able to devise specific rules for the investment farms regarding their water use, because of their lack of knowledge on the details of the investment farms' water use.

To summarise, the degree of dependency on natural resources, dependency on government support, and education and knowledge differ in a characteristic way between the actor groups. This leads to an unequal distribution of power resources, and thus to unequal bargaining power of the actors. According to the Distributional Theory of Institutional Change, the actor with the higher bargaining power resulting from a favourable resource provision will ultimately push for the agreement that is most favourable to him or her. This explains why the institutional setting changed towards an arrangement that favours the investment farms.

CONCLUSION

The paper has shown how interrelated the governance of land and water is. We provide empirical evidence of how agricultural FDI, which is usually associated with the topic of land rights, has a strong impact on various property rights on water as well. With the example of foreign horticulture farms in Ethiopia, we show that water rights changed directly and indirectly. There are direct changes with the set-up of a new association reshaping the formal agreements. There are indirect changes as water access and withdrawal rights from a canal are intrinsically tied to land rights. Indeed, those farmers who lost access to their land due to the investment farms settling in their area indirectly lost their water rights.

We have also shown that the Distributional Theory of Institutional Change is very helpful in explaining how and why the new association is now regulating the agricultural water sector. Furthermore, the investment farms' advantage in the bargaining process due to their endowment with particular power resources has been demonstrated. Thus, diverging interests not only lead the struggle for land but also the directly linked struggle for water.

While 'dependency on natural resource' and 'education and knowledge' are widely used actors' characteristics in the Common Pool Resource Theory, the actors' characteristic 'dependency on government support' has not been discussed widely, particularly not in relation to what this means for bargaining relationships. 'Dependency on government support' as used here refers to the farmers'

dependence on agricultural support and healthcare provided by the government, as well as the fact that governmental support is contingent on general political conformity. Local farmers obey state officials because of a culture of fear about opposing government and a feeling of being dependent on agricultural support or healthcare from the authorities. This Ethiopian particularity makes local community actors and small-scale subsistence farmers very vulnerable to power misuse. Each actor who is aware of this relationship can strategically use this information. Empirical investigation has proven that this characteristic is a key in understanding power relations in Ethiopia and allows for additional use of the power resources, such as 'positional power', 'network power' and 'sanctioning power'. Individual actors who are well aware of this context can make use of their power resources (which they anyhow possess) to derive beneficial outcomes or agreements.

In this respect, there is also a strong link to the power resource 'knowledge'. The design and establishment of new rules (as shown here for the irrigation sector) can be done in such a way that the competing other actor who will be made worse-off after the reform thinks it originates from the government. The competing other actor will thus follow the new rules and not complain, even if the reform is to their disadvantage.

The study raises the essential question: can resource-poor smallholders share water with foreign government-backed investors on an equal basis? In this case, it was evident that existing power relations and the different degree of possession of power resources make sharing on equal terms particularly challenging. However, if one intends to build an agreement that benefits both parties, taking the unequal power relations into account can serve as an entry point leading to more balanced outcomes.

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