



Agricultural Foreign Direct Investment and Water Rights: An Institutional Analysis from Ethiopia

By Andrea Bues

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Agricultural Foreign Direct Investment and Water Rights - an Institutional Analysis from Ethiopia

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Andrea Bues (1), (2), (3)

(1) Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg,
Germany (current address), andrea.bues@posteo.de

(2) Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany

(3) Humboldt University Berlin, Department for Agricultural Economics, Berlin, Germany

Abstract

This paper aims to analyse the impacts of agricultural foreign direct investment on the local institutional setting of water management in a country in which most of the population depends on agriculture. It presents the case of a small-scale irrigation scheme in Ethiopia where floricultural and horticultural farms have started to use the same canal water as local farmers. The study found that the institutional arrangement changed towards a setting that distributionally favoured the investment farms and led to a shift in blue and green water rights towards the foreign actor. This institutional change is explained by the diverging bargaining power resources of the actors.

1 Introduction

Water and land are becoming scarce resources worldwide. Due to rising food prices, bioenergy policies and population growth, demand for arable land and its corresponding water resources has risen dramatically. In the last years, the trend of foreign actors securing land for food, bioenergy crop cultivation and other agriculture-related production has increased substantially, both in terms of number and scale of the investments (see IFPRI 2009, GTZ 2009, The Economist 2009). Water plays a central role in these land deals, as acquiring access to water resources is one of the major goals of foreign investors (BMZ 2009), and many of the investment projects take place in areas that have previously been farmed at small-scale and low-intensity level.

This phenomenon, often referred to as “land-grabbing”, has gained considerable attention over the last years. Many see major opportunities for low-income countries to generate foreign capital inflow and urgently needed investments in agriculture, while others raise concerns as to food security, as fertile agricultural land is devoted to producing export goods instead of staple crops for the local population (Daniel and Mittal 2009). However, the question of water has so far received only limited attention. Water management is, to a large

extent, an institutional question (Cotula 2006, Theesfeld 2010). Institutions are “*the humanly devised constraints that structure human interaction*” (North 1994: 360), and water rights as one form of institutions regulate questions referring to use, access, withdrawal, exclusion and alienation (Schlager and Ostrom 1992) and are grounded in various legal orders (Meinzen-Dick and Nkonya 2007). Furthermore, water can be classified into “blue” and “green” water (Falkenmark 1995), blue water describing liquid water in the form of groundwater and surface water, and green water being the water which is stored in the soil, absorbed and transpired by plants, or evaporating “unused”.

As acquiring water rights plays an important role for many investors, investment projects are highly likely to affect the institutional arrangement for water management present in the area, as the distribution of available water resources must be re-negotiated between previous and “new” resource users. Especially in low-income countries where a large percentage of the population depends on agriculture, negotiation of water rights can become a question of vital importance.

The impact of agricultural foreign direct investment (FDI) on the local water situation has not so far been given adequate attention, although some attempts have been made. Smaller and Mann (2009) for instance argue that attaining water rights is an essential consideration for agricultural investments which results in a shift of water rights from domestic to foreign actors. Several organisations have also mentioned possible consequences of investments on local water rights in concept notes or first drafts of codes of conducts for agricultural FDI (BMZ 2009, IFPRI 2009, FAO/IFAD/UNCTAD/World Bank Group 2010). However, these first attempts have not provided examples of how agricultural FDI impacts on the local water (management) system in a low-income country where most of the population depends on agriculture. Neither have they identified the characteristics, outcomes, and influencing factors of the potential institutional change that happens as a result of investors entering the arena of a given case study, nor included the dimension of green and blue water in the analysis of water rights. This study therefore aims to contribute to closing this gap by presenting an institutional analysis from a low-income country where agricultural FDI impacts on the local institutional arrangement for water management. The study aims at answering the following questions:

1. How does agricultural foreign direct investment affect local water institutions in the case study area?
2. How do green and blue water rights change?
3. How can the change in institutions be explained?

The case study is located in the East African country Ethiopia, which serves as an example of a low-income country that experiences and embraces high inflows in agricultural FDI.

Ethiopia has become one of the most important target countries for agricultural FDI, which accounts for 32% of the *total* FDI inflows to Ethiopia (Weissleder 2009). Two contributing factors are: (1) Ethiopia is well-endowed with water resources (World Bank 2006), and only 30% of the country's arable potential is being used for crop cultivation (MoWR 2002), suggesting a large potential for the expansion of agricultural crop production; (2) Several recent policy frameworks such as the "Growth and Transformation Plan for the Period of 2010 to 2014" (MoFED 2010) open up the way for the large-scale commercialisation of agriculture by foreign investors. Additionally, investors encounter direct support in terms of customs duty or income tax exemptions (EIA 2010). The estimated dimension of land area assigned for agricultural FDI in Ethiopia differs according to the source, ranging from 390.000 ha of land (Addis Fortune 2009) to just under 600.000 ha (Die Zeit 2010). Most of the investors come from the European Union, India, Israel, Saudi Arabia and the United States. Weissleder (2009) identified two main investment periods of agricultural FDI to Ethiopia: between 2000 and 2005, the main investment flows occurred in the flori-/horticultural sector, with the EU, India and Israel investing more than 60% of their total FDI in Ethiopia in this sector. From 2006 to 2008, investments in flori-/horticulture almost doubled, and investment in meat and biofuel crop production increased dramatically.

In Ethiopia, agriculture is the main source of livelihood and the main pillar of the economy, contributing to approximately 43% of GDP (2008/2009), 86% of foreign currency earnings and 85% of rural employment (EIA 2010). Most of Ethiopia's cultivated land is used for rainfed agriculture, with smallholder subsistence agriculture accounting for 85% of employment (MoWR 2002). Hydrological variation, recurrent floods and droughts as well as a lack in mitigating strategies such as water storage facilities lead to frequent crop failures and 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 28% for the whole of sub-Saharan Africa (FAO 2010). By the end of 2009, 6,2 million people were in need of emergency food relief (WFP 2010).

With favourable investment policies, a perceived abundance of land and water resources, as well as an economy that heavily depends on agriculture, the case of Ethiopia is a typical example of a low-income country that both receives and embraces agricultural FDI. Zooming in, the case study focuses on a small-scale irrigation scheme in the administrative Region of Oromia, where nine flori-/horticultural investors settled and started using the same irrigation system as local farmers. Out of the 11 Regions of Ethiopia, Oromia is among those experiencing most agricultural FDI. As for foreign flori-/horticultural foreign investments, Oromia has received the highest share of all regions (Weissleder 2009). As in most rural areas of Ethiopia, agriculture is the predominant source of livelihood in the area under

investigation. The average holding size is below one hectare. Three Kebeles (the smallest administrative units) benefit from the irrigation scheme, and in one exemplary Kebele, the average holding is 0,81 ha, distributed among three plots (OWRB 2008). As in other areas in Ethiopia, limited holding size has become a major challenge for rural development. The governmental Oromia Water Resources Bureau (OWRB 2008) identifies the following contributing factors to a decrease in land holding size in the area of the irrigation scheme studied:

- Population pressure with little opportunity for non-farm employment
- Competition for the available land due to urbanisation and investment activities
- Expansion of the floriculture industry

In order to assess the *how* and *why* of the institutional change that occurred in the study setting, the paper is structured as follows. Firstly, the methodology and the description of the irrigation scheme are presented, including a characterisation of the actors. Secondly, the results present the institutional arrangement for water management *before* and *after* the investment farms settled in the area. This section also includes the interactions of the actors, which are important in order to evaluate the performance of the new institutional arrangement. Thirdly, the results are discussed employing a theory of institutional change, being followed by a presentation of potential and limitations of the study and the conclusion.

2 Methodology and Description of the Setting

2.1 Research Strategy and Methods

The research strategy employed is the qualitative single case study. Methods used included the analysis of textual data, direct observation, and semi-structured interviews, the latter representing the main source of data. Empirical fieldwork was carried out between 20th of June and 31st of August 2010. Interviewees included local farmers, investment farm employees, governmental officials, and researchers. Out of the six operational investment farms in the area, five farm representatives were interviewed. Additionally, ten interviews with governmental officials and researchers took place, both on the federal governmental level in the capital city of Addis Ababa and on the regional level. 70 farmers from two communities were interviewed in total, both in focus group discussions and in single interviews. All interviews with local farmers were conducted in the local language Oromifa and transcribed and translated to English before being analysed. All interviewees' answers were encoded as some only spoke on condition of anonymity. For the same reason, the two communities interviewed are named "community A" and "community B".

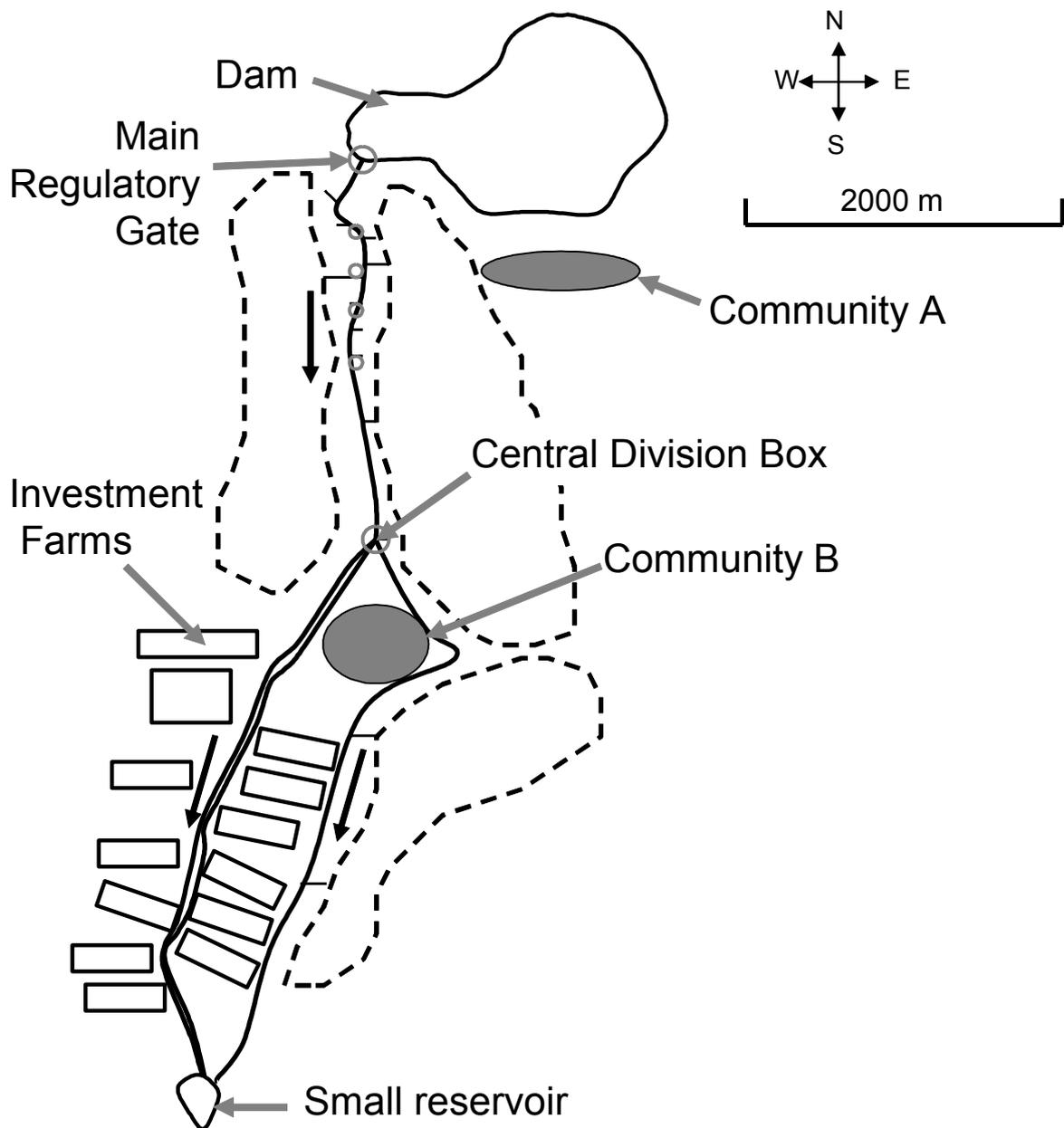
The theoretical background of the study is Institutional Economics. Furthermore, the hydrological classification of blue and green water (Falkenmark 1995) was used. As the distinction between green and blue water does not formally occur in the case study setting, it must be noted that this concept is only used in the discussion of water rights later on in this paper. Additionally, this study employs both the bundle-of-rights approach regarding water rights (Schlager and Ostrom 1992) as well as the distributive bargaining theory of institutional change (Knight 1992). This theory explains institutional change as a “*by-product of substantive conflicts over the distributions inherent in social outcomes*” (Knight 1992: 40). Actors pursue a strategy to reach distributional advantage, and the bargaining outcome is shaped and determined by different bargaining power resources, such as risk aversion, time preference, exit costs, positional power, network power and sanction power. *Exit costs* (Schlüter 2001) are the costs that arise for actors when bargaining is either lengthy or ultimately unsuccessful. *Risk aversion* and *time preference* are closely linked to exit costs. They are, to a large extent, determined by the actor's available resources: if an actor is not dependent on an immediate outcome of the bargaining because he or she possesses enough resources, he or she has a low risk aversion and a low time preference. *Sanction power* refers to the threat of sanctions imposed by one actor on the other in case of non-compliance. This threat influences the bargaining situation of the threatened actor to the benefit of the threatening actor: under the threat of sanctions for non-compliance, compliance to informal rules becomes a rational long-term strategy (Knight 1992: 179). *Network* and *positional 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. These bargaining resources make up the bargaining power of an actor and determine to whose advantage the bargaining will be.

2.2 Biophysical Features of the Scheme and Actor Characterisation

Biophysical attributes and material conditions determine and shape what actions are physically possible and how actions shape the outcomes of the setting (Ostrom 2005: 22). 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, the original objective being to establish state-owned horticultural farms with a corresponding 1600 ha of irrigable area (OWRB 2008). Only 500 ha were realised, and a state-owned farm was installed to produce vegetables and fruits. This farm was only operational for several years, after which the land was partly given to smallholders, the rest remaining unused. Around 2005, the government allocated approximately 140 ha to floricultural and horticultural investors, both from the area of the former state farm and also from local farmers, who were granted compensation. Since

the arrival of the investment farms in the area, the canal water has been shared among both. The canal structure is as follows (see figure 1): The source of the canal water is a dam situated in the northern part of the canal setting. The water flow into the primary canal leading southwards to local farmers and investment farms is controlled at a regulatory gate on the southern side of the dam. At the central division box, the primary canal is repartitioned into two secondary canals: one leads eastwards to community B, the other southwards to the investment farms. Investment farms and community B thus share the outflow of the central division box, while community A is situated upstream of both. The secondary canal leading southwards is again divided into two canals, one running on the right and one running 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 community B. The canal on the left side is only used by the investment farms. The secondary canals all end in a small reservoir.

Farmers use irrigation water only from tertiary canals, some of which, alongside the central division box and main regulatory gate at the dam, can only be opened by using a specific key which only the water guards have. Water guards are paid local farmers who open and close the metal gates upon request. The question of who controls water resources is therefore not only determined by the upstream/downstream setting, but to a large extent also by the question of who is in the position to make the water guard open the gates.



Legend:

- ➔ Water Flow Direction
- Main Canal
- - Farmers' Canals (Selection)
- ▭ Plots of Investment Farms
- - - Area Farmed by Local Farmers
- ◊ Water Body (Other than Canal)
- Community Homesteads
- Metal Gates, Locked by Key

Figure 1: Sketch of the irrigation scheme (own representation, based on field survey and Google Earth satellite image)

2.3 Characteristics of the Actors and Initial Rules

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 area by extension workers, and partly also by a governmental-supported and -controlled water enterprise, which started operation in 2008 with the mandate to take over the management of the irrigation scheme.

Investment Farms

Nine floricultural and horticultural farms are directly situated along the investigated canal, and three are located at some distance to the South. Out of these, six are operational, while three are not fully operational due to financial difficulties. Five out of the nine farms are entirely owned by foreign investors from the Netherlands (two), Israel (one), the Palestinian Territories (one), and China (one). Two of the farms are organised as joint-ventures between Ethiopian and foreign investors (Russian/Ethiopian and Israeli/Ethiopian), and two farms are completely Ethiopian. The average farm size is 20 ha. As mentioned above, the farms were allocated land from the former state farm and from local farmers.

These farms, being situated in the Southern part of the irrigation scheme, irrigate their greenhouses and open fields during the whole year. Water needs for irrigation and operation of farm activities are met by borehole extracted groundwater, and to a smaller degree from 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 other farms have one or several reservoirs on their compound which are filled by canal and groundwater. Irrigation techniques used by flower and horticultural farms differ. While some outdoor horticultural producers only use drip or spray irrigation, most of the flower farms use additional computer-driven water regulation to steer humidity in their greenhouses. Furthermore, many of the flower farms have established a water recycling system.

Local Farmers

In the case study area, three communities use canal water for irrigation. In order to assess effects on both upstream water users and on farmers who directly share water with the investors, two communities were included in the study - community A is upstream, community B further downstream. Neither of the communities has access to clean drinking water. Community A uses water primarily from the dam as drinking water, while community B uses canal water for drinking. Farmers irrigate their fields only during the dry season from September to May. Simple flooding of the fields and by hand using a can are the prevalent

irrigation techniques. The major crop types in the rain-fed season are wheat (46%), teff (40%), and pulses (13%) (OWRB 2008). The use of irrigation allows for a second harvest and a shift in crops. Under irrigation, the major types of crops are onion, tomato, potato and chickpeas. Furthermore, irrigation and the fertile soil enable many farmers to produce agricultural surplus and sell it on the nearby local market. The irrigation scheme contributes directly to food security in the area. Tesfaye et al. (2008) found that approximately 70% of the irrigation users were food secure, whereas this applied only for 20% of the non-users. Food security was also found to be highly seasonal, the time of food shortages occurring at the same time as the rainy season starts, in June, and lasting up to November, which is the start of the harvest season.

3 Results

This section presents the initial institutional set-up, the changes, as well as the interactions of the actors, which are important in order to evaluate the performance of the new institutional arrangement.

3.1 Institutional arrangement before 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 direct regulation on water rights for the case study site exists from the federal governmental side. Accordingly, investment farms did not report any direct governmental regulation that they had to follow. However, all exporting investment farms were certified by private initiatives which focus on the treatment of sewage water (e.g., EHPEA 2008).

As for local farmers, before the investment farms settled in the area, their water management structure was characterised by self-devised rules with almost no governmental involvement. All water users were organised in groups with a membership of 15 to 40 farmers, with a committee of several farmers each who were in charge of group organisation. In order to acquire canal water rights, a farmer needed to pay the land tax or rent land from another farmer, to become a member of a group and abide by its rules. Rules included to "use water by turn", "use water properly", and "attend meetings". "Proper use" of water meant to use appropriate amounts of water, not to waste water, not to flood adjacent fields and to alert the water guard if the canal becomes overflowed. Water guards were certain farmers in charge of opening and closing the metal gates using the specific tool. Maintenance activities such as cleaning the canal were done collectively 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 that they wanted to include for the following season.

All the groups in community A, and some of the groups in community B, raised water user fees. Like the other rules, farmers devised this for themselves. The fees were collected by the farmers' committees, which consisted of a chairperson, a cashier and a secretary. In community A, all interviewed farmers stated they annually paid 20 Birr per hectare of land they had. The charge was paid irrespectively of the actual water consumption level, and no metering tool existed. The water charge was used for repairing the canal, paying the water guards, and for administrative issues such as tea for meetings and writing pads for the committee. Unlike in community A, not all groups in community B imposed user fees on their members. Most of the groups also implemented sanctions for non-compliance. In both communities, those rules were, however, rarely executed, flexible, and depending on the situation. (See table 1 below for a summary of fines before and after the set-up of the investment farms).

3.2 The change and the new arrangement

All interviewed parties confirmed that water scarcity had increased from the time the investment farms arrived in the area, due to two main reasons. Firstly, the investors entered the arena as additional, intensive water users, and secondly, the numbers of farmers using irrigation increased. In the first three 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 dam, the tertiary canals and the central division box. Local farmers, on the other hand, still worked with the guards paid by the user groups. The presence of these two different guards led to direct water conflicts at the gates. Farmers reported that "*hostility*" (interviewee r) 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 flower farm managers took the initiative to set up an association consisting of representatives from the investors and local farmers. The main purpose was to solve the water conflict and organise the maintenance of the canal system such as cleaning and repairing it. The association comprises a chairperson and his assistant, a programme coordinator, and a person in charge of the finances. The position of the *chairperson* is filled by the employee of a water enterprise which is supported and controlled by the government. The chairperson had been extension worker for the area prior to his new post and is therefore known to local farmers as a governmental 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 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 both represent the main contact to the farmers. Both are familiar to local farmers, either being a farmer himself (the programme coordinator) or having worked as extension worker in the region (the chairperson). Attached to and paid by the association are also four *water guards*, two at the central division box and two at the dam, who receive orders from the association to open and close the canal gates. They replace the water guards employed by local farmers and the guards engaged by investment farms.

The association regularly calls for meetings among representatives from farmers and investors. Those meetings are joined by several representatives from the investment farms and two farmers from each community using irrigation. The chairperson of the association, however, reported that rarely all farmers, nor all representatives from the investment farms, participated in the meetings of the association, due to work commitments (interviewees). The association is neither organised nor actively supported by the government. Its only direct link with the government is the fact that its chairperson is also an employee of the government-supported water enterprise.

Soon after the association was formed, several changes to the organisation of water use and management in the area were implemented. The fact that the same individual is the chairperson of the association, employee of the water enterprise, and used to work as a governmental extension worker, has the consequence that many local farmers perceive most of the changes as the government's intention, and not as decisions made by the association in which they are in principle represented. The following changes occurred to the communities after the setting up of the investment farms in the area and the consequent establishment of the association.

(1) Re-organisation of the farmers' user groups. New user groups with lower membership were established, and it was decided that each group would elect five committee members for their own respective group. The committee members of all groups then elected two members among themselves to join the meetings of the association as farmers' representatives. The user group committees were assigned a key role in the activity of the association. Firstly, as a link of communication between farmers and the association: if farmers want to address the investment farms, they are supposed to contact their user group committees. Secondly, the committees have the mandate and the instruction to collect the water user fees and the fines for non-compliance to the rules, and hand it over to the association (see below). As before, each group had a set of rules, but unlike before, these rules must now be in written form and signed by all irrigation users before the start of the irrigation season. As regards the devising of rules, local farmers actively participated in the process of finding an agreement for the group, and neither the government nor the

association intervened in the general selection of the rules. The rules were similar to those that were previously in place.

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

Representatives of the association clearly affirm that these water payments are collected and imposed by the association and not by any governmental side, nor by the water enterprise. Government representatives, on the other side, were not aware of the collection of water use fees in the area. Two governmental extension workers stated, when asked about water payments, that farmers did not pay for water, nor for water management (interviewees c and d). Furthermore, a governmental official from the local Water Bureau said that the water enterprise had not started yet and that the collection of the water fees would start "*next year*", in 2011 (interviewee e). Irrespective of which statements officials from the association, the government and the water enterprise make, most farmers again were convinced that the collection of water fees originated from the government.

(3) Substantial increase of sanctions. 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, as discussed before. With the re-organisation of the user groups, fines for non-compliance were introduced (if not present before) and raised substantially. For the investment farms, however, no such penalty was implemented. As with previous changes, local farmers were convinced that this change was the government's intention, and reported that the system of an initial warning in case of non-compliance in place before had changed to a system where no warning was issued and penalty was considerable. Table 1 provides an overview of the change in fines for the three rules "use water when it is one's turn only", "use water properly", and "attend the group meetings".

Table 1: Range of fines for non-compliance before and after FDI

	Before the set-up of the association		After the set-up of the association
	Community A	Community B	
Use water during turn	5-10; 30-40*	30-50	50-100
Use water properly	50	5-10; 30-50*	150
Attend meetings	none, 5, 10, 20-30*	none, 5-10, 10-20*	200-250

* Here, different user groups reported different ranges of sanctions

In community A, farmers reported to have been told to rise the fines to 75 Birr in the case of a member using water outside his or her turn, while in community B, farmers stated that they were only asked in general to raise the fines. The head of the farmers' user groups, who is represented in the association as the programme manager, confirmed that the order to increase the fines comes from the association and suspects the government behind it: *“The current punishment is very serious. It is from the association. I think the association received this serious punishment from the government. We must accept, whether it is a punishment or a new rule which comes from the association”* (interviewee b).

(4) Set-up of a water turn-taking system between the investment farms and local farmers. This corresponds to the initial motive behind the new association to settle the conflict between the two water users. While local farmers still decided the turns among themselves, in the year the association was created, it ruled that investment farms may use the canal water for three days a week, and local farmers for four days a week. This arrangement did not prove to work due to constant rule-breaking by both actors, so another rule was enacted, leaving the days to local farmers and the nights to investment farms. This rule, again, was not fully respected, which will be further discussed later. As with the other changes, local farmers perceive the government as being behind this change.

(5) Re-organisation of canal maintenance. The association also re-organised the cleaning schedule of the canal. The investment farms clean the canal from their farms to about 200 m south of the dam, while local farmers from community A clean the last part of the main canal and their small canals. Farmers from community B clean their small canals up to the central division box. The association also organises the time of cleaning and requests workforce from both sides when maintenance activities are considered necessary.

Apart from these changes that occurred as an initiative of the association established, local farmers attributed other changes in the area to the set-up of the investment farms, the most important being increased water scarcity. Other reported changes were:

- Small-scale land rental among farmers, which had already been practised before, a increased and now included farmers who came from outside the communities. 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, also after the first investment farms were settled, land commercialisation continued without governmental involvement by which some investment farms rented additional plots for cultivation from local farmers. The farmers interviewed reported that many farmers rented their land and migrated to the towns.

- The atmosphere in the farmers' user groups became worse after the setting up of the investment farms, “*respect and fraternity*” changing to “*hostility*” (interviewee f).
- Many farmers complained about chemical inputs affecting workers' life in the investment farms, or harming their livestock.
- Employment possibilities of the youth were mentioned as a positive consequence of the investment farms settling in the area.

Having characterised the main changes that occurred either indirectly as a result of the investment farms having settled in the area or directly as a consequence of the set-up of the association, a closer look is now taken at the performance of the association. The official idea behind the new association was to provide a platform for common agreements between investment farms and local farmers. However, local farmers did not feel equally represented in the association. Many of the farmers interviewed express a sense of being powerless with regard to the association's decisions, perceiving a low sense of control regarding the decisions made. The main farmers' representative in the association expressed a feeling of being at the mercy of the new association's decisions. He stated that he did not know the aim of “*this committee*”, and 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*” (interviewee b). Local farmers' general dissatisfaction with the new agreement manifests itself in actions and interactions that will be discussed in the following section.

3.3 Actions and interactions after the new agreement

As outlined before, actions can be seen as the evaluation of the new setting by the affected actors. An action “*can be thought of as a selection of a setting or a value on a control variable (...) that a participant hopes will affect an outcome variable*” (Ostrom 2005: 45). Therefore, the actions reflect the actors' position to the new arrangement. In this case, the actions aim at increasing their share in canal water. Five major actions are identified here: appealing to other parties, taking physical action, neglecting turns, influencing decision-makers, and using other sources of water.

Table 2: Chosen Strategies of Actors in Reaction to Low Canal Water Level (Source: Interviews)

	Local farmers	Investors
(1.1) Appealing to the government	Yes, but officially not allowed	Rarely
(1.2) Appealing to the association	Yes, via the user group	Yes
(1.3) Appealing to the other actor	Yes, but officially not allowed	Rarely
(2) Taking physical action	Yes (blocking canal, digging new canal)	Yes (unblocking canal)
(3) Neglecting turns	Sometimes (sanction)	Yes (no sanction)
(4) Bribing the guard or the association	No, rarely	Sometimes, Yes
(5) Using other sources of water	Drinking Water: Yes Irrigation Water: No	Irrigation Water: Yes

(1) The first set of possible actions involves trying to improve the water situation by **appealing** to authorities, farmers' committees, the association, or to the other actor. Local farmers complained to governmental regional bureaus such as the Regional Investment Bureau. This bureau confirmed that farmers had complained and referred to the federal level government who supported the investment farms, leaving no scope of action to the regional offices. Local farmers also complained to the association via their farmer user groups' committees, because, as mentioned above, they were not allowed to contact the investment farms directly. A farmer from community A reported to have complained to both his farmers' committee and the government, but both had not given him “*any response. So we prefer to keep silence*” (interviewee g).

As for the investment farms, their representatives reported to have complained to the association, but rarely to governmental bodies. They stated that if water shortage in the canal occurred, they contacted the chairperson or the farmers' representative of the association who called the water guards to open the water gates. Several farm managers complained that it sometimes took a whole day before the situation improved. Some of the investment farms also complained to local farmers directly by sending workers to blocked canals (see below).

(2) The second set of possible actions aims at influencing the situation by **taking physical action** to change the flow of water in the canal. This refers to changing the canal structure by blocking the water flow or by digging new canals. 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. Blocking the canal was a commonly used strategy by local farmers. Farmers from community A and farmers from community B sharing the southern canal with the investment farms reported to have sometimes blocked the canal during the dry season when

water scarcity occurred. The investment farms reported to have taken counter-action: one farm manager explained that the agreed procedure in the case of canal blocking was to call the association which would settle the conflict. However, this procedure took “*too long*”, and therefore, the farm manager sent workers to unblock and re-open the canals, but he admitted that this “*only causes fighting*” (interviewee k). Another farm manager confirmed that “*in times of water crisis*”, a farm guard was instructed to observe the canal situation and report back (interviewee h). In case of canal blocking or any other action, the manager reported to send workers to re-open the canal. One investment farm manager stated not having used canal water during the irrigation season of 2009, as not enough canal water had reached him due to farmers blocking the canal (interviewee k).

Not only blocking of the canal took place, but also actions to change the overall structure of the canal. Farmers from community A reported that in 2009, around 80 farmers got together to dig a new canal leading off from the main canal to their fields. This action was stopped by the association's chairperson who, according to the farmers, told them that this new canal competed with downstream water use and that they were therefore not allowed to proceed.

(3) ***Neglecting water turns*** is a third strategy and action that actors undertook in order to improve their water situation. As mentioned before, the association had organised a turn-taking system between investment farms and local farmers to use the canal water, having assigned the days to local farmers, and the nights to the investment farms. The turns among local farmers still persisted, as well as some rules for water turns among investment farms. Most local farmers stated that they abode by the association's rule, and referred to the sanction they would encounter in case of non-compliance. Especially referring to other individuals, farmers reported that the rate of non-compliance had increased. One farmer from community B for instance stated he would have been “*in trouble*” if he had not taken water outside his turn and therefore preferred to be sanctioned (interviewee j).

Regarding the investment farms, most of the farm managers stated that they used the canal water when they needed it and when it was available. One farm manager stated that “*of course*” they used canal water also during the day to fill up their reservoirs, there was “*no other possibility*” (interviewee k). Another farm manager argued that there was more water at night, but finding workers at night was difficult (interviewee n). Farm managers did not encounter any fine from the association in case they used the canal water outside their turn. Both local farmers and investment farms accused each other of not respecting the agreed turns. One investment farm manager for example stated that farmers did not respect their turns because of their use of furrow irrigation which consumed a too large quantity of water (interviewee m).

(4) A fourth type of interaction that occurred between investment farms and local farmers is ***influencing decision makers***, which implies bribing the water guards or those who have

power over the water guards. Both local farmers and managers of investment farms stated that those side-payments were “possible”. All farmers interviewed were convinced that the investment farms bribed the water guard, either directly or via the association. When asked whether farmers also used this method to influence the water guard, farmers mostly denied, referring to the small amount of money that farmers could offer, as compared to the financial possibilities of the investment farms. Also the farmers' representative in the new association who was in charge of conveying the association's decisions to the water guards reported that in case the investment farms call him for more water, he called the water guards to open the water guards for them, fearing sanctions from the association in case he would not do so. When local farmers asked him for more water, however, he stated that he could not do much: “*We give to the flower farms when they ask us, whether it is day or night time, but we mostly can't give to the farmer.*” (interviewee b). He was also convinced that bribery took place, the investment farms directly calling the water guards to open their gates and offering money. All the water guards interviewed denied accepting side-payments (interviewees o,p,q), and one guard stated to be pressured by both sides to open the canal gates irrespective of their turns (interviewee p) .

Several investment farm managers reported that direct side-payments to decision-makers were common practice before the founding of the association. As for now, farm managers said that side-payments “*are possible*” (interviewee i) and “*some farms do that*” (interviewee n). Another one says that he “*heard about it*” and “*of course this happens. You buy them a bottle of beer or something*” (interviewee k). One farm manager stated that in case of canal water shortage, he had called the water guard directly and offered him money to open the water gate (interviewee m). However, the usual procedure in case of canal water shortage was, as all investment farm managers agreed, to call the chairperson of the association.

(5) The fifth strategy related to a low water level in the canal is ***using other sources of water***. In case of a low water level in the canal, neither of the two farmer communities has another source for irrigation water nearby. Regarding drinking water when the canal water level is low, farmers from community B use a river situated one hour's walk from their homesteads, while farmers from community A use drinking water from the dam. As the investment farms use canal water only as an additional source for irrigation (next to borehole-extracted groundwater), investment farms are able to increase the share in groundwater and thus make up for a lower availability of canal water.

3.4 Synthesis: How the institutional arrangement and water rights changed

This section summarises the findings regarding the change in the overall institutional arrangement and the change in water rights.

Regarding the new arrangement, different rules and sanctions were put in place for local farmers and investment farms (see table 3). While four binding rules were introduced for local farmers, only two rules were established for the investment farms. Those were paying the yearly water fee, and respecting the water turn-taking system between investment farms and local farmers. No sanction was introduced in the case of non-compliance. The investors admitted to only respecting the first rule, and did not follow the agreed system of turns. Therefore, only one effective rule for the investment farms was in place. For local farmers, four rules were implemented, and three of them were sanctioned in case of non-compliance. Some farmers reported to have broken some of the rules, but unlike the investment farms, they faced punishment in monetary terms. Concerning the meetings of the new association, no binding rule for attendance was implemented for either of the two actors.

Table 3: Binding Rules and Sanctions for Investment Farms and Local Farmers

	Local Farmers	Investment Farms
Paying the yearly water fee to the new association	yes (no sanction)	yes (no sanction)
Attending group meetings	<i>regarding farmers' groups:</i> yes (sanction if non-compliant)	<i>no such groups exist</i>
Attending the meetings of the new association	<i>only for representatives; no sanction if not present</i>	<i>attending the meetings of the new association is voluntary</i>
Respect the turns	yes (sanction if non-compliant)	yes (no sanction)
Use water properly	yes (sanction if non-compliant)	not explicitly

This change in the institutional setting implies a shift in water rights. The study reveals that the five rights subsumed under the term “bundle of rights” (Schlager and Ostrom 1992) change to a different extent and in a different way. As state-devised formal water rights do not explicitly exist in the case study area, this section focuses on the change to *informal* water rights. It focuses on water for irrigation as a source of blue water, but excludes drinking water from the analysis. As for green water, the right to access, withdraw, manage, alienate, and exclude others from water stored in the soil and in plants are considered. However, it must be noted that green water rights do not explicitly exist in the case study setting, but are used here as a theoretical concept to stress the importance of the green dimension of water.

In general, blue water rights changed both explicitly and also via the change in land rights, while green water rights changed implicitly as being intrinsically linked to land rights. Regarding the direct change of blue water rights, acquiring blue water rights before the set-up of the investment farms was organised as follows: a farmer first needed a land title from the government, or to rent land from local farmers, then join a water user group, sign the respective agreement and pay the water fee (if in place in that group), then he or she may 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 blue water did not change, but rather withdrawal, management and exclusion rights: while the previous procedure to acquire blue water rights persisted, farmers' *withdrawal rights* were constrained with the set-up of the turn-taking system, the rise in sanctions and the collection of water use charges by the association. Blue water *management rights* changed in the way in which the association decided on the cleaning schedule of the canal, which had previously been decided by the farmers' user groups. *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 blue water rights persisted among local farmers such as decisions on exclusion of farmers from the groups, or decisions on the turn-taking system among farmers in a group.

Both green and blue water rights changed indirectly with the change in land rights. The study found that both blue and green water rights are intrinsically tied to land rights. Local farmers may have land without the right to canal water (blue water), but not vice versa. Similarly, green water rights are completely dependent on the respective land right. The change in green water rights can therefore be explained by the linkage of green water rights to land. Most of the investment farms were originally allocated land from the former state farm of the area, thus no re-allocation of local farmers took place and no land rights changed. Other investment farms were established on former farmers' land, who were granted compensation. Consequently, land rights changed and as the land taken over by investment farms included highly irrigable plots of farmland, local farmers also lost their actual or potential blue water right to use irrigation water from the canal – all blue water rights, except access rights, thus change with a corresponding change in land rights. A shift in land rights also touches green water rights that are attached to the land – if access, withdrawal, management, exclusion and alienation rights do not exist for the land, neither do they exist for green water. Here, the shift in land to the investment farms led to a shift of the corresponding green and blue water rights from local farmers to the investment farms.

Apart from these changes in blue and green water rights, the *execution* of these rights also changed: the study revealed a change in the execution of blue water withdrawal rights due to the social factors corruption and rent-seeking. Local farmers' initial blue water rights could previously be executed to a better degree, because after the investment farms were set-up, they could be constrained by an actor who had the power to bribe key individuals such as water guards and members of the new association. The execution of water rights is also related to the question as to who has more power in the association set up. This question of power will be further discussed in the following section.

Table 4: The Observed Change in Green and Blue Water Rights

			Access	With-drawal	Management	Exclu-sion	Alienation
Direct change	Blue water		o	+	+	+	o
Indirect change via land rights	Allocation of farmers' land to investment farms	Green water	+	+	+	+	+
		Blue water	o	+	+	+	+
Change in execution of water rights	<i>Social factors:</i> Corruption and rent-seeking	Blue water	o	+	o	o	o
Legend: + right changed; o no change;							

4 Discussion

The central objective of this paper was to examine how and why the institutional arrangement for water management in a low-income country changes as a consequence of agricultural foreign direct investment. In the investigated case study, the unequal implementation of rules and sanctions between investment farms and local farmers explained in the previous section led to an unequal distributional outcome: for local farmers, certain actions and types of behaviour were constrained by particular rules, and breaking those rules was costly. For investment farms, only two such behavioural rules were implemented, and neither of these rules were sanctioned. This led to overall higher costs for local farmers and thus, to distributional disadvantages as compared to the investment farms. The institutional arrangement for water management in the area therefore shifted towards a setting containing rules that distributionally favoured the investment farms.

The second question asked how the change in institutions can be explained. Although many farmers were dissatisfied with this new arrangement, they nonetheless formally accepted it: their farmers' committees carried out the association's decisions, such as increasing the fines for non-compliance or handing over the collected water user charges to the association. The question arises as to why this new arrangement was implemented, and thus why institutional change occurred, as the new regulation obviously favoured one of the actors. In other words, the question is, "*how some actors can affect the alternatives available to others in such a way as to get them to act in a way that they would not otherwise choose to do*" (Knight 1992: 42). According to the distributive bargaining theory of institutional change, institutions are a by-product of strategic bargaining for substantive outcomes. In the case study, "substantive outcomes" refer to the blue water rights to canal water. Green water rights are omitted here, as they do not exist in explicit form and are not subject to bargaining. The distributive

bargaining theory explains unequal distributional outcomes and bargaining processes with existing asymmetries in power, which are reflected by an asymmetry in resources (Knight 1992: 42).

Two major actor characteristics best describe the differences between investment farms and local farmers: resource dependence and governmental support. These two characteristics impact on the bargaining power resources as discussed above: risk aversion, time preference, exit costs, positional power, network power and sanction power.

First, *resource dependence* differs significantly among the two actors. As previously discussed, local farmers used the canal water for their livelihood, including drinking water, water for livestock, irrigation, subsistence agriculture and for producing for the small-holder market. Investment farms met their water needs primarily from groundwater, while canal water was only used as an addition. As a result of their resource dependence, local farmers were more *risk averse* than investment farms, and had a shorter *time preference* than investment farms. These two factors impact on the *exit costs*, which were defined as the costs that arise for an actor in case an agreement is difficult to reach or ultimately fails. The situation of “no agreement” between investment farms and local farmers can be compared to the first years of the investors' presence in the area: no common agreement was in place, each actor employed their own water guards and conflict was pervasive. Due to local farmers' higher resource dependence, 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, *governmental support* is probably the most important factor in the study. In order 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 actors 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. While foreign investors in the agricultural sector enjoy extensive governmental assistance, this does not necessarily apply for rural farmers. On the one hand, rural farmers are supported by governmental extension workers and governmental services, but on the other hand, governmental representatives often exert pressure on the population. Governmental support, which can be vital in rural Ethiopia, is often dependent on good-will and on conformance to political ideology (Human Rights Watch 2010). This leads to many rural farmers holding a deeply humble and submissive attitude towards the government.

While foreign investment farms are thus in the position to enjoy unconditional governmental support, local farmers can be intimidated by the government and are not in the position to receive unconstrained support. In the case study, the association took all the decisions that changed the institutional setting. As mentioned above, many farmers thought that the

association's decisions originated in the government, due to personal overlaps in the association, contributing to their acceptance of the changes.

The fact that investment farms were supported by the government and that the association was chaired by an employee of the state-controlled water enterprise gives the investment farms relatively higher *positional power* and *network power*, as compared to local farmers. Additionally, the investment farms, represented by the association, were able to exercise *sanction power* to decide, via the association, about water management in the area, and particularly about the fines for non-compliance of local farmers.

To summarise, the investment farms enjoy a higher status in both of the actor characteristics resource dependence and governmental support. This leads to an unequal distribution in power resources, and thus to an unequal bargaining power of the actors (see table 5).

Table 5: The Three Main Actors' Characteristics Impacting on Power Resources

Actor characteristics	Power resources	Local farmers	Investment farms
Resource dependence	→ Risk aversion	high	low
	→ Time preference	high	low
	→ Exit costs	high	low
Governmental support	→ Positional power	low	high
	→ Network power	low	high
	→ Sanction power	low	high

From this point, it can be clearly explained *why* the institutional setting changed towards an arrangement that distributionally favoured the investment farms: according to the distributive bargaining theory, the actor with the higher bargaining power will shape the bargaining and ultimately push for the agreement that is most favourable for their interests. Because of their lower *resource dependence* and higher *governmental support*, the investment farms are clearly the actor with higher bargaining power. Therefore, they were able to design the new agreement favourable for them, while local farmers as actors with the weaker bargaining power did not have another choice but accept it. The distributive bargaining theory is therefore well suited to explain institutional change in the case study area.

To summarise, the potential of this study is that it provided, as one of the first studies in this field, an analysis of the impact of agricultural foreign direct investment on local water institutions in a low-income country. The chosen case study proved to be a particularly interesting case, as attempts to solve the water conflict between local farmers and investment farms had already been undertaken by setting up an association in charge of solving the conflict. This allowed for an analysis of both the changes in water institutions, and

an evaluation of the performance of the newly established agreement. The limitation of the study is that due to its limited scope, no environmental, social or economic cost/benefit analysis could be included in order to test the overall consequences, other than those on water institutions, on the local farming system. This is certainly an important issue to cover when assessing effects of agricultural FDI on a community.

5 Conclusion

The case study illustrated an example of agricultural foreign direct investment where foreign investors and local farmers were characterised by different degrees of *resource dependence* and *governmental support*. These factors are highly deserving of consideration, as they lead to different degrees of bargaining power resources, which again shape the process and outcome of the actors' bargaining over locally available water resources. In the case study, these power resources led to a shift in the institutional arrangement for water management, including a change in informal water rights. As the identified actors' characteristics are typical for agricultural FDI settings, the study allows for generalisation and for anticipating possible outcomes of agricultural FDI in an area. It thus contributes to the discussion on impacts of international land deals on the local water situation.

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