Evaluating Baseline Indicators Pertaining to Oxfam America's Water Program in Ethiopia

A Revised Report

Prepared for Oxfam America

By

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1. Executive Summary

The goal of Oxfam America's Water Program in Ethiopia is to improve smallholders’ food security and strengthen their livelihoods in moisture-stressed areas of Oromiya, Tigray and Amhara National Regional States. To realize this goal, smallholder households must exercise their rights to access and manage water resources sustainably and equitably, for irrigating crops and raising livestock. Better access, equitable sharing, and sustainable management are essential outcomes that must be achieved along the path to greater food security and more resilient livelihoods.

Oxfam America's Water Program in Ethiopia is based on a Theory of Change that includes the following components, pertaining primarily to institutions, investments, and capacity:

1. Co-investments and co-decision-making involving NGOs (and CSOs), communities, and governments will promote capacity building in local agencies, enhance knowledge and awareness of water rights and policies, and stimulate formation of community organizations, such as water user associations and marketing cooperatives.

2. Improvements in capacity, awareness, and organization will lead to more equitable access and better governance of water resources, while enabling households to increase productivity and obtain higher revenues for their output, through better access to markets and positive engagements with the private sector in the supply of agricultural inputs and services.

3. The regulatory and institutional framework required to ensure equitable access to water and the fair distribution of water rights can be developed through multi-stakeholder dialogues regarding policy constraints and opportunities, legislative measures, incentives for investment, and the appropriate role of government agencies in supporting the development of smallholder water schemes.

4. Successful implementation of the first three components will produce a new rural landscape in which communities take greater charge of decisions involving water rights and resources, water rights are recognized and protected in law, women's water interests have equal status with those of men, and smallholders gain the confidence and resilience to engage in entrepreneurial activities.

Co-investment and co-decision-making are key elements in this theory of change, as are discussions with many stakeholders at several levels of interaction. It is essential to engage community members, representatives of NGOs, and government officials with local, regional
and national responsibilities. Changing perspectives and gaining support for efforts that enable households to exercise water rights and empower communities to play larger roles in decisions regarding resource management will require substantial investments of human and financial capital over many years.

The Need for Baseline Indicators

The likelihood of achieving the goals of Oxfam America's Water Program, which will be implemented from 2010 through 2020, will be enhanced by periodically evaluating progress according to a set of impact indicators. Such evaluations will enable researchers and other project participants to assess and modify their activities during the course of the program. Within this framework it is essential to select the best set of indicators and establish accurate information describing baseline conditions.

The construction of a baseline for use over an extended time is different than that which would accompany an outcome focused, short-term project. Oxfam America seeks the active advice, input, and guidance from research partners on the substantive nature and use of a programmatic baseline, and ongoing, iterative impact research and monitoring during the lifetime of the program (10 years). Oxfam America believes that a good baseline will enable:

a) Long-term, longitudinal learning,

b) Integral participation and inclusion of partners and people themselves, in a collective sense, developing processes pertaining to progress or regress with regard to the root causes of poverty, and

c) Rigorous impact assessment in the future.

Constructing such a baseline is an adaptive challenge, one requiring methodological innovation, thinking out of the mainstream box, and hard choices rooted in a sophisticated understanding of the politics of knowledge in development programs.

Goals of the Study

The objectives of this impact baseline study were:

- To provide empirical evidence on the current conditions of a selected set of impact indicators,
- To probe the assumptions underlying the core proposition in the program’s theory of change, and formulate evidence-based findings revealed while examining the impact indicators, and
- Provide recommendations for further impact monitoring and research.

The impact baseline will be used for evaluating the impacts of interventions in the region during the lifetime of the Oxfam America’s Water Program (2010 - 2020).

Implementation

Following a literature and desk review by TANGO in November 2009, a research design workshop with researchers from IWMI and Oxfam in January 2010, and a consultation workshop with all stakeholders in February 2010, a field data collection plan was developed covering three
sites in the program’s primary intervention area, being moisture-stressed areas in the Oromia National Regional State of Ethiopia. A comparative case study within case study was conducted through rapid visits during April, and the data were analyzed during May through July.

**Recommendations for Refining the Strategy**

Given the information we have gathered from members of rural households and representatives of NGOs and government agencies pertaining to irrigation investments in moisture-stressed, rural areas of Ethiopia, we recommend enhancing the Theory of Change in four ways:

1. Distinguishing more clearly between the desired outcomes and impacts that changes in perceptions, behavior, and policies will generate, over time

2. Rearranging several elements in the Theory of Change to depict more clearly the time dimensions of co-investments and other activities,

3. Adding several elements that reflect near-term needs and opportunities in moisture-stressed, rural areas of Ethiopia, and

4. Inserting intermediate and long-term outcomes and impacts that can be used in evaluating program effectiveness.

We present our proposed enhancements in Table 3.4, which depicts three sets of co-investments and activities, along with pertinent outcomes and impacts. The first set includes near-term co-investments intended to generate desirable outcomes and impacts by 2015. Several of the co-investments are not shown explicitly in the original Theory of Change, yet we think they deserve recognition. We recommend moving forward with co-investments in water scheme development, coincident with making similar investments to provide affordable access to complementary inputs and to improve household access to storage facilities and viable markets. Such investments must be made in concert to ensure that investments in water development are effective in achieving desirable outcomes.

It is also essential to ensure that sufficient water resources are available to support irrigation development in project areas. This will require a combination of hydrologic, agronomic, and policy analysis to determine the amount of water available, the likely farm-level demands for water, and the potential changes in government policies that might modify water supply or demand conditions without consideration of project activities.

The hydrographs of water availability in moisture-stressed regions likely depict substantial variation, as surface water volumes depend on seasonal rainfall. The stochastic nature of surface water supplies must be considered carefully when designing irrigation interventions in arid areas where the sum of farm-level demands for water will exceed the available supply in most years. Establishing legal systems of water rights is a desirable outcome, but water rights cannot guarantee the availability of sufficient water for irrigation in a moisture-stressed region with highly variable rainfall patterns. Even the best system of water rights and the most effective water user associations cannot completely eliminate farm-level risk and uncertainty in such
regions. Policy makers and project designers must investigate and explain these issues clearly when evaluating investment alternatives.

**Recommendations for Further Impact Research**

While conducting this impact assessment research, Oxfam America and its partners will have notable opportunities to enhance understanding of the importance of water and other inputs in efforts to improve smallholder livelihoods in water-stressed regions of Ethiopia. By establishing groups of panel households and gathering information from them, researchers will learn about the many constraints and opportunities that shape livelihood activities and determine food security within seasons and over time. Some of those constraints and opportunities lie outside the water sector, yet they influence the degree to which interventions pertaining to water and irrigation will enable smallholder households to improve their livelihoods. Researchers can learn also about household perspectives regarding cooperatives that might be formed for jointly purchasing inputs or marketing farm products. They can also engage households in long-term discussion of the best ways to ensure the sustainability of irrigated farming in water-stressed areas. While conducting this research, it will be important also to remain appraised of the investments and activities of other investors and donors that will impact water demands or supplies.

In sum, we propose that researchers gather information and conduct timely analysis in the following four areas of interest:

1. The importance of non-water inputs in agricultural production and marketing in water-stressed areas,
2. Household and local government perspectives regarding measures to increase the likelihood that forming cooperatives will enhance smallholder access to input and output markets,
3. Efforts needed to ensure the sustainability of irrigated farming activities,
4. Information regarding the investment and program activities of the government and non-governmental organizations.

We describe each of these areas of interest in turn.

**The Importance of Non-Water Inputs**

Improvements in food security and the strengthening of rural households cannot be achieved through investments in water resources, if other constraints prevent households from using water effectively. Assigning water rights and encouraging rural communities to take greater responsibility for economic development will be helpful in achieving intermediate outcomes, but the long-term impacts of those efforts will depend on the successful achievement of complementary outcomes that lie outside the scope of water interventions. For example, households need affordable access to financial credit, purchased inputs, and training. They also
need storage facilities and ready access to active markets when producing perishable vegetables. Oxfam America can greatly enhance the value generated through its water program by recognizing the importance of non-water inputs, and working with households and other stakeholders to remove any binding constraints that prevent households from taking full advantage of improvements in their access to water resources.

Researchers should gather information from panel households describing non-water constraints, as viewed from their perspective. In addition to collecting data describing cropping patterns, irrigation activities, cultural practices, crop yields, and marketing, researchers should inquire about the availability and affordability of complementary inputs, such as modern seeds, fertilizer, farm chemicals, machinery, and credit. They should ask also about the distance and time required to bring farm produce to market, and the challenges or successes that characterize household interactions in market settings. Information describing crop losses due to inadequate storage or inefficient transport also will be helpful in determining why farm-level yields remain below potential yields, even after farmers gain access to irrigation water.

**Household and Government Perspectives Regarding Cooperatives**

One hypothesis of the research program is that households will have greater success in obtaining inputs and selling outputs at attractive price points if they form cooperatives that represent them in market transactions. Greater net returns could enable farmers to invest in storage facilities, transportation, and equipment. This hypothesis is consistent with the views of many researchers, particularly in the context of commercial farming activities in which farmers produce higher valued crops, such as fruits, vegetables, cotton, and coffee. However, it is not yet clear if cooperatives will successfully enhance market opportunities for smallholder farmers producing lower valued cereals. Many smallholders produce limited amounts of output, and the fees for joining cooperatives might exceed the returns they could generate through the coordinated sale of their crops.

Information gathered in this research can enhance understanding of the potential viability of cooperatives in achieving desirable goals in smallholder settings in rural Ethiopia. Researchers should inquire about household perspectives regarding water user associations and other forms of cooperative management and marketing. They should inquire also about the interest and capacity of local governments to support the formation of cooperatives. If additional capacity is needed, researchers should learn which form of capacity-building assistance would be most effective. It will be helpful also to learn if changes are needed in local or national laws regarding formation or membership in farmer-owned cooperatives.

**Efforts Needed to Ensure Sustainability**

Ensuring the sustainability of irrigated farming in an arid region requires the successful matching of irrigation demands with water supplies, and careful management of soil and water quality. Farmers must be motivated to use land and water resources efficiently, as viewed from both near-term and long-term perspectives. In particular, they must perceive correct signals regarding resource scarcity and crop production values, and they must have rights of ownership that encourage them to maintain the productivity of land and water resources, over time. Farmers
must also have access to the information and technical assistance they need to implement appropriate management methods. In regions with notable poverty, in which many farm households struggle to achieve food security, it is essential to achieve the right balance between resource scarcity signals, such as prices and allocations, and access to information and technical assistance.

The path toward achieving the sustainability of a water-for-production investment begins with the assessment of potential demands for water in irrigation and livestock watering, and water resource availability. In arid regions of Ethiopia, it is possible that water supplies might not be sufficient to support desirable irrigation investments, even if the investments are targeted primarily toward smallholders. The amount of water available in surface streams and lakes can vary substantially each season with the amount and timing of rainfall. In some years and seasons, water supply might be adequate to support a full community of irrigators and livestock herders, while at other times the supply might not be adequate. In such settings, it will not be sufficient to assign water rights and establish an allocation program. Farmers will need to understand also the likelihood of having enough water at the appropriate times to support successful crop production. It is possible that farmers will continue to operate in a scarcity-driven, risk-averse manner, even after gaining access to water for irrigation.

Learning of the Investments and Programs of Others

In areas with limited water resources, it is essential also to know the irrigation investment plans of other NGOs and government agencies. Scarce supplies in arid regions can easily be exhausted if the number of irrigators exceeds the level that might be sustained in a carefully managed program of water withdrawals. In some areas, one or two commercial farming operations can draw down the available water supply very quickly, thus possibly preventing smallholders from obtaining irrigation water at critical stages of plant growth and development. In theory, a well-defined system of property rights to water should prevent such conflicts. However, it is essential to limit the number of water rights to the amount of water available, and to define the rights in terms of proportions of the amount of water available each season. The rights must also be successfully enforced.

Given the essential role of complementary inputs and the importance of access to markets, Oxfam must become aware of any investment programs that will enhance these features of the agricultural environment in water-stressed areas. The impacts of irrigation investments will be limited in areas where complementary inputs are unavailable or unaffordable, and where farmers must struggle to market just a portion of the cash crops they produce. If investment plans are not evident, it might be necessary to revise Oxfam's planned interventions accordingly. Perhaps Oxfam can assist in motivating NGOs or the government to undertake supportive investments. If not, it might be necessary to include a broader scope of activities within Oxfam's investment portfolio.
Summary

In sum, we view the panel household component of this impact assessment research as having five objectives:

1. To obtain information describing the smallholder livelihood impacts of gaining access to irrigation water,

2. To learn about the implications of non-water constraints and opportunities on household choices and activities,

3. To gain insight from households, regarding how water intervention programs might be adjusted to better reflect the implications of non-water constraints,

4. To learn about household perspectives regarding cooperatives that might be formed for purchasing inputs or marketing farm products, and

5. To engage households in discussion of measures needed to ensure the sustainability of irrigated farming activities in water-stressed areas.

Successful interaction with panel households during the course of this impact assessment research will generate a wealth of information on these critical issues. The information will enable researchers to adjust the parameters of Oxfam America’s water program, while the program is underway. In addition, the insights that researchers gain from panel households will enhance their understanding of binding constraints and unrealized opportunities in ways that might not have been possible without engaging in sustained discussions with residents of the study area. This remarkable opportunity should motivate researchers to design panel household instruments and conduct their interactions in ways that not only facilitate data gathering, but also encourage household members to describe the implications of non-water constraints, discuss issues such as cooperatives and sustainability, and provide critical insight regarding helpful adjustments in the design of intervention programs.

To ensure success of the panel household component, it will be essential to maintain timely contact with each household. While conducting the baseline assessment, we have provided each household with a notebook and pen, and we have started the process of engaging them in long-term data collection. It is essential to visit with each household on a regular basis to ensure they understand the program, and they feel as though they are a critical part of an important research effort. The data tables we present in this report generally reflect the information we have collected from the panel households. That information can be enhanced substantially over time, by developing a detailed data collection format that panel households can use to record observations as they are generated.

The panel household component of this research should be viewed as a special opportunity to gain insight regarding the issues, constraints, and opportunities that households face as they endeavor to achieve food security. Researchers can begin by first learning how households perceive food security and how they assess their food security status. Information describing the
relationship between food aid and agricultural productivity at the household level also will be helpful. It is possible that food aid influences household decisions regarding crop and livestock production. In sum, there is much to learn from the panel households, and a carefully crafted research design will maximize the value of this remarkable opportunity.

**Conclusion**

Enabling farmers to reach the threshold of productivity at which they can achieve and sustain food security and begin generating a surplus in some years will require substantial effort. Uncertainty regarding hydrographic and environmental constraints, risks pertaining to household investments and changes in livelihood strategies, and the current lack of access to farm inputs, markets, and infrastructure will complicate efforts to enhance rural livelihoods throughout the course of Oxfam’s water program. It is critical that Oxfam monitor federal and regional investment plans and policy adjustments, while advocating for an appropriate water rights codification system. Such a system must ensure equitable access to water resources, while accounting for annual and seasonal variability in water supplies. Local governments and water user associations should promote the wise management of water resources, with the goal of enhancing livelihoods in sustainable fashion, while also maintaining and enhancing environmental quality.

To achieve the long-term goals of its water program, while also enhancing understanding of these complex and challenging issues, we recommend that Oxfam consider conducting the following activities:

1. Review current investment plans for water-stressed areas in the region of Oxfam’s program, and develop a keen understanding of the hydrographic and environmental studies completed in support of those plans;

2. Take a clearer position regarding the conditions under which Oxfam is willing to co-invest in small-scale water systems, and state those conditions very clearly and transparently in every negotiation (e.g.; when discussing co-investment plans with the government, and when addressing issues such as access to input and output markets);

3. Give greater attention in feasibility studies and in project baselines to the availability of water resources from a hydrographic perspective, and assess the possible long-term environmental impacts of interventions, while ensuring also that Oxfam has the necessary expertise for preparing these studies; and

4. Stimulate the sustainability debate at the federal level, relying on valid, case-based evidence (developed through grassroots projects), combined with broader hydrologic, agronomic, and policy analysis.
2. Primary Findings and Recommendations

2.1. Summary Chart of Evidence on Each Impact Indicator

We have gathered substantial evidence pertaining to 13 impact indicators during interviews and focus group discussions involving members of rural households and representatives of NGOs and government departments. We worked in three rural areas in which a subset of households has access to irrigation water.

The Golbra Girisa Scheme in the Shalla District

This is a traditional, river diversion irrigation scheme (designed and constructed by farmers) involving either 32 or 38 households. The farmers have created a water user association on their own initiative. The government has conducted a feasibility study to examine the potential for expanding the scheme in cooperation with Oxfam. The size of the expanded scheme will depend in part on the cost.

The Burqitu Multiple Use Irrigation Scheme in the Duga Dawa District

The Burqitu scheme provides water for domestic and livestock use, in addition to irrigation water. There are 23 groups within a somewhat large Water User Association. There is a subcommittee for irrigation within the Water User Association. There are 515 households benefitting from either domestic or irrigation water. The total irrigated area is 50 hectares and about 100 households benefit from irrigation.

The water source is spring water on mountain sides. The water is collected via gravity in large, concrete tanks and then delivered downhill from there. The old system had a 0.6 km main canal. With Oxfam’s intervention, the canal system has been extended to 12.5 km, including the secondary canals. There are conflicts along the canal, as farmers often do not wish to wait for their turn to resume irrigation. The length of time between turns might be as long as 28 days, which is much longer than on many other rotational irrigation schemes.

The Abinne 2 Irrigation Scheme in the AJK District

The Abinne 2 scheme is powered by diesel pumps that divert water from a lake. A water user association manages the pumps and collects monthly fees from members. The system is gravity flow beyond the diversion point from the lake. Abinne 2 is much closer to Addis than the other two schemes. There is a paved road available and, hence, farmers have better access to input and output markets. Representatives of IDE have told us there are about 1,000 pumps around the lake. The size of lake has decreased by 3.5 km within the last 10 years. There are about 2,000 hectares under irrigation in the district, involving both small-scale and commercial development.
The evidence we have collected from participants at the three sites is summarized by impact indicator and irrigation scheme in Table 2.1. More detailed information is provided in Table 3.3.
Table 2.1. Summary of Evidence Regarding the Assumptions and Research Questions Pertaining to Selected Impact Indicators

<table>
<thead>
<tr>
<th>Study Site 1. Golba Girisa, SSI, CDI, Shalla District, West Arsi Rift Valley</th>
<th>Study Site 2. Burqitu MUS, Duga Dawa District, AFD</th>
<th>Study Site 3. Abinne 2, SSI, SEDA, East Shewa Rift Valley, AJK District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Equitable access to productive opportunities related to land and water</strong> <em>(in intervention areas)</em>&lt;br&gt;<strong>Assumptions and Questions</strong>&lt;br&gt;Who benefits? Who is systematically excluded? <em>(power dynamics between various social &amp; ethnic groups)</em></td>
<td>The water system involves between 32 and 38 households. The farmers have created a water user association on their own initiative. Access to water is determined by the location of land. Only those farmers close to the main canal receive water. In addition, only those households providing labor during canal construction are eligible to receive irrigation water. Households wishing to gain access later must pay 1,300 Birr as a minimum entry fee. This is too high a fee for most households. Households can rent irrigated parcels annually for a price of 500 Birr per 0.25 hectares. The price is negotiable and it can vary with family connections.</td>
<td>There are 515 households benefitting from either domestic or irrigation water. Only 104 or 105 households benefit from irrigation. There are conflicts along the canal, as farmers often do not wish to wait for their turn to resume irrigation. The length of time between turns might be as long as 28 days, which is much longer than on many other rotational irrigation schemes. Households are expected to pay 20 Birr per year for maintaining the canal system. Residents are largely of the same ethnic group (Oromo), and thus there are no issues involving access and ethnicity. AFD has attempted to persuade farmers to promote the recognition of women as legitimate owners of land, but this perspective is not yet widespread. There is no provision for recognizing more than one wife in the process of registering and obtaining a title to land. Polygamy is common, yet there is no legal recognition, such that some wives are excluded from land registration. Hence, many women are not legally entitled to land ownership when a husband dies.</td>
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<tr>
<td><strong>2. Farm produce prices / nearest market prices / price discovery / storage</strong> <em>(in intervention areas)</em>&lt;br&gt;<strong>Assumptions and Questions</strong>&lt;br&gt;The farmers gain access to markets if they are well organized in independent business entities</td>
<td>The nearest district town is 40 km away, and the road is quite poor and difficult to transit. A smaller, alternative market is a two-hour walk away. Most residents use horse-drawn carts for transporting produce to the market. Lacking storage facilities, many farmers lose notable portions of their produce. The households are price takers in spot markets, as they must accept market prices when the produce is ready to be sold.</td>
<td>The nearest market is 6 km to 8 km away by road. On market days, the farmers carry their produce to the market, using ox-drawn and donkey-drawn carts. Lacking storage facilities, many farmers lose notable portions of their produce. The households are price takers in spot markets, as they must accept market prices when the produce is ready to be sold.</td>
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that have bargaining power on market prices and invest in transport, inputs and storage... markets, as they must accept market prices when the produce is ready to be harvested and sold. harvested and sold. Middlemen often purchase produce cheaply from farmers and sell it for a higher price in a distant market.

storage facilities. There is a glut effect on prices, also, because many of the farmers produce the same crops and harvest them at the same time.

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<tr>
<th>3. Input price paid by WUA versus non-WUA farmers (in intervention areas)</th>
<th>There is an informal WUA, but the association does not engage in marketing activities. The WUA largely allocates water to farmers and organizes labor for cleaning canals. The WUA has been operative for only 1 year. Most farmers in this very remote region do not purchase or apply commercial inputs. The lack of credit contributes to low levels of input use.</th>
<th>The Water User Association is involved primarily in water allocation and distribution. It is not involved in purchasing inputs or marketing outputs. There are no differences in prices paid by members and non-members of WUAs.</th>
<th>The Water User Association is involved primarily in water allocation and distribution, and in maintaining the pumps at the lake. It is not involved in purchasing inputs or marketing outputs. There are no differences in prices for members and non-members of WUAs.</th>
</tr>
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<td>Assumptions and Questions</td>
<td>The farmers gain access to markets if they are well organized in independent business entities that have bargaining power on market prices and invest in transport, inputs and storage...</td>
<td>The Pastoralist Development Office at the Woreda level plans to strengthen the capacity of pastoralists in the region. They plan to support private pond development in groups of 5 to 7 households. The Office also is working on irrigation development, in conjunction with other Woreda level offices. Action for Development (AFD) is investing in water for productive and domestic uses. Their productive water program primarily involves improving the availability of water for livestock. AFD and CARE plan to form a consortium of NGOs working on water. Much of the focus will be on domestic water use and water for livestock.</td>
<td>The Woreda does not have a plan for investing in water for productivity. However, the federal and regional governments are planning to expand the size of irrigated area. SEDA, IDE, and the Rift Valley Children and Women Development Association are investing in irrigation and domestic water use in the region. We are not aware of the proportions of budgets made available for investments in water productivity.</td>
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<td>Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?</td>
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| 4. Current NGO investments directly in “water for productive use” (hard ware & software) (at communal, regional and federal levels) | To date, there are no government or NGO investments in this area. However, households have constructed an irrigation canal and formed a WUA to oversee canal maintenance and manage water deliveries. | The Pastoralist Development Office at the Woreda level plans to strengthen the capacity of pastoralists in the region. They plan to support private pond development in groups of 5 to 7 households. The Office also is working on irrigation development, in conjunction with other Woreda level offices. Action for Development (AFD) is investing in water for productive and domestic uses. Their productive water program primarily involves improving the availability of water for livestock. AFD and CARE plan to form a consortium of NGOs working on water. Much of the focus will be on domestic water use and water for livestock. | The Woreda does not have a plan for investing in water for productivity. However, the federal and regional governments are planning to expand the size of irrigated area. SEDA, IDE, and the Rift Valley Children and Women Development Association are investing in irrigation and domestic water use in the region. We are not aware of the proportions of budgets made available for investments in water productivity. |
5. Current woreda budgets from the region for "water for production" (in intervention areas)

**Assumptions and Questions**

Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?

| There is no Woreda budget for water for production. The Woredas obtain their budgets from regional governments. The Woredas generally do not have authority or flexibility to make large adjustments in the budgets. In many cases, personnel costs account for 85% to 95% of Woreda budgets. Revenues generated locally by Woredas must be delivered to the regional government. Hence, there is limited incentive for a Woreda to raise revenue from farmers and other residents. In a sense, the notion of paying taxes for the purpose of supporting the provision of government services is not yet in place. Most residents are quite poor and they have little income from which to extract tax payments. Yet absent locally generated tax revenue, there is little incentive to provide quality services to local residents. A pertinent research question is to discover a mechanism for starting the virtuous cycle of affordable, reasonable tax payments in support of high-quality, desirable public services. | There is no Woreda budget for water for production. The Woredas obtain their budgets from regional governments. The Woredas generally do not have authority or flexibility to make large adjustments in the budgets. In many cases, personnel costs account for 85% to 95% of Woreda budgets. Revenues generated locally by Woredas must be delivered to the regional government. Hence, there is limited incentive for a Woreda to raise revenue from farmers and other residents. | There is no Woreda budget for water for production. The Woredas obtain their budgets from regional governments. The Woredas generally do not have authority or flexibility to make large adjustments in the budgets. In many cases, personnel costs account for 85% to 95% of Woreda budgets. Revenues generated locally by Woredas must be delivered to the regional government. Hence, there is limited incentive for a Woreda to raise revenue from farmers and other residents. |
6. Donor funding commitments, federal government policy, and investment plans for small-scale irrigation and water for pasture *(at federal level)*

**Assumptions and Questions**
Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?

Plans for investing in water for production are not evident. Most officials and donors are more interested in providing domestic water supply at this time. At the district level, the federal government is making motor pumps available to households. The pumps can be used to withdraw water directly from a river. In our study area, irrigation water is distributed to parcels via gravity flow from the community’s river diversion point. We did not observe any pumps at the diversion point. Water is diverted from the river via gravity.

The government has large investment plans for the District. The Pastoral Development Office at the zonal level has already begun constructing projects for domestic water and livestock use. This is part of the new Fentale Scheme. The government is eager to obtain co-funding to support their investment plans in this area. To date, NGOs operating in the region have not expressed much interest.

The government intends to invest in water for livestock as part of a program to encourage the settlement of pastoralists. The plan at the zonal level is to develop 100 ha of land around Abinnee, by providing a motor pump and constructing primary and secondary canals. The plan is to serve 200 households, thus allowing them each to irrigate about 0.5 hectares.

The government has recently built a dam on the Bulbula River to support irrigation development. This is partly an attempt to displace some of the demand pressure on the lake.

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7. Woreda capacity to support communities in developing and managing their water resources *(in intervention areas)*

**Assumptions and Questions**
Woreda officials will be motivated to play a strong supportive role if they receive sufficient budget and incentives from the regional government.

The Woreda Water Resource Office needs 28 professionals, but they have only 7 at this time. Of the 7, there are 6 diploma holders (3 electro-mechanical engineers, 1 specialist in rural water supply and sanitation, 1 specialist in small-scale irrigation and drainage, and 1 specialist in water technology) and one secretary. The office lacks a functioning vehicle for transporting staff members to the field. They currently use horses and donkeys. They have only one computer, and no internet access.

An estimated 95% of the budget of the District is allocated to personnel. At the zonal level, there are 18 professional staff members in the Water Resources Office. Three of these are women, but their roles are not clear. There is a general shortage of staff members. In all study areas, there is high staff turnover in the Woreda departments. Reasons include the lack of desire to work in remote areas. Many facilities are substandard. The high turnover rate limits current capacity and the rate of capacity development in Woreda departments.
### 8. Productive water needs & interests\(^1\) met (by social group)  
**in intervention areas**

This study area is in a small watershed with little variation in social groups. Most residents are of the same ethnic group. It is likely that all households would desire additional water for production, but the lack of water is not related to social status, although the location of land is a determining factor. Regarding gender, men own most of the land in this area. Women generally lack access to irrigation water, even if they are listed on land title certificates. Women’s access to land and water generally is considered secondary to that of men.

Livestock and domestic water needs are largely met in this area. There remain notable unmet demands for irrigation water. Few women have access to land and water for productive purposes, in their name.

Most households would prefer to have more water. The current pumping capacity is not sufficient to meet all water demands. However, it is not clear that a higher rate of annual pumping could be sustained for long, given the limited rate of inflow into the lake. The potential sustainability of irrigation from the lake should be examined prior to making additional investments in water for productive use. Regarding gender, few women have access to land and water for productive purposes, in their name. The practice of polygamy contributes to the limited access, as second and third wives are not eligible to hold rights to land or water. SEDA has begun encouraging the allocation of land to second wives and female heads of households, who have traditionally had no access to irrigated land.

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### 9. Proportion of women in leadership positions in community institutions and their influence on community priorities/decisions  
**in intervention areas**

We observed no women in leadership positions in the intervention area. We understand that there might be one woman on the Ward Council (kebele), which is a higher-level entity that includes the intervention area and other villages. In addition, we observed no women in leadership positions in the local Water User Association.

The treasurer of the Water User Association is a woman, but in most other organizations, women are not serving in leadership positions. It is rare for a woman to serve as treasurer, given that men hold most of the influential positions. Women are seen as trustworthy with finances, but generally they are not given meaningful responsibilities or decision-making authority. Within the district, there are 27 women’s associations and cooperatives. Most of these focus on credit and other aspects of community support. None focuses on irrigation.

Only one woman serves as a committee member in the Water User Association. She serves as the cashier or treasurer. At times, the husband of this woman attends WUA meetings in her place, thus demonstrating the limited authority and influence that women actually exert within the association. While men attend WUA meetings on behalf of their wives, we did not observe any cases in which women attend meetings on the part of their husbands. The practice is asymmetric and it reflects the lower status assigned to women within the structure of water user associations.

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\(^1\) Measurement of this indicator will involve a range of aspects, such as whether the water system design reflects the needs of women and other disadvantaged group, and is approved in the WUA before construction begins.
10. Proportion of women in leadership positions and their influence on priorities/decisions in NGOs working on small-scale water resource development for smallholders (in intervention areas)

None of the NGOs with whom we visited employs women in leadership positions at this time. Women are employed as junior-level field staff and in secretarial and other support positions.

A woman serves as the gender officer in AFD, which has implemented programs designed to help women learn more about marketing strategies. The gender officer for AFD has told us that she has very little influence regarding AFD’s priorities and decisions.

Fewer than 10% of the SEDA professional staff members working in the region are women.

11. Proportion of women in leadership positions and their influence on priorities/decisions in Government Offices responsible for small-scale water resource development for smallholders (at local and regional levels – in intervention areas)

Of the 7 professional staff members in the Woreda Water Resource Office, the only woman is serving as the secretary. In all areas, the government tends to set quotas for women in all institutions. Women should account for a minimum of 30% of staff membership. Women are encouraged to move into leadership positions. However, in many of our discussions, it became clear that the number of women serving in leadership positions is quite small.

Of the six professional staff members in the Water and Irrigation Department, none is a woman. There are three women in the Woreda Cabinet, but this is likely less than 1% of the membership. Two women serve as Team Leaders in Bureaus, while two women serve as school directors, and 15 serve as speakers at the Peasant Association level. There may be as many as 300 persons in the Peasant Association.

The district employs 454 persons in all sectors. There are 353 males and 101 females. In addition, there are 555 teachers, of whom 395 are male and 160 are female. Of the teachers, 44 have degrees, of which 36 are male and 8 are female.

12. Water productivity (in intervention areas)

Crop yields obtained with irrigation generally are higher than yields without irrigation. We provide several examples of household yields with and without irrigation in Table 3.3.

Crop yields obtained with irrigation generally are higher than yields without irrigation. We provide several examples of household yields with and without irrigation in Table 3.3.

Many households report improvements in livelihoods, but they lack access to key inputs, such as seeds and fertilizer. Yields are higher with irrigation, but input prices are high and there is a persistent threat of drought.

13. Household food security level (in intervention areas)

Most households are challenged to provide year-round food supply, even with irrigation. Large family sizes and the substantial annual variation in crop yields exacerbate the challenge of achieving household food security. We provide examples of food security information for several households in Table 3.3.

We understand that 401 of 1022 (36%) of households are on the government sponsored food security scheme. These data pertain to the Peasant Association, which is a larger group than those who have access to irrigation, which is about 515 households.

We provide examples of food security information for several households in Table 3.3.

Grain prices have been increasing, while vegetables prices have not been sufficiently high. As households must purchase grain in the market, they are concerned about the prospect of not generating enough revenue to purchase food supplies. Some households struggle to achieve food security, while others consume 3 meals per day. Irrigation enhances farm output, but households with irrigation can be disqualified from receiving government-sponsored food support. We provide examples of food security information for several households in Table 3.3.
2.2. Summary of Findings With Regard to Assumptions and Research Questions

Impact Indicator 1

Equitable access to productive opportunities related to land and water

The assumption motivating this indicator is that access to land and water might vary among ethnic groups or according to some other measures of social status. The data we have collected support this assumption, although the empirical situation is different in each of our research sites. In the Shalla District (Site 1), access to irrigation water is determined largely by location. Households located near the main canal have the option to receive irrigation service, while those further away must depend on rainfall. Service is limited also to the households that provided labor to assist in the construction of the main canal. Households that did not provide labor at that time can purchase the right to receive irrigation water, but the price of 1,300 Birr is higher than many households can afford.

Most of the households at the Burqitu site are of the same ethnic group (Oromo), and thus there are no issues regarding ethnicity and access to water. However, only 105 households of the 515 households in the area benefit from irrigation. The maximum irrigated area allowed per household is one hectare, but there are some exceptions. All owners of livestock have access to the watering system, provided they are registered with the Peasant Association.

At the Abinne 2 site, households belonging to the Silte ethnic group have better access than Oromo households. The Silte expressed a stronger interest in irrigating crops at the time the irrigation system was constructed. The Oromos showed less interest, as they focused more on raising livestock. Over time, the Oromos have expressed a greater interest in irrigation, thus generating tension between the two ethnic groups regarding access to water. Given the limited supply of water available in the lake, the size of irrigated area per household is quite small. Most households irrigate a plot of only 200 square meters.

Impact Indicator 2

Farm produce prices, access to markets, and price discovery

In concept, farmers acting cooperatively to purchase inputs and sell their produce should be able obtain better prices that farmers acting alone. For this reason, farmers in many regions form cooperative marketing associations that seek to obtain favorable prices by negotiating with input suppliers and produce buyers on behalf of the membership. Such associations can be very helpful in increasing household incomes, particularly in
developing countries, where individual farmers often lack experience with market price discovery and negotiating with agents to obtain favorable prices for inputs and outputs.

In all three study areas, farmers have not yet formed cooperative associations for the purpose of purchasing inputs or marketing farm produce. In each area, the farmers with access to irrigation water have formed a water user association, but that organization generally focuses on operating and maintaining the irrigation supply network. In concept, WUAs can provide a helpful starting point for cooperative sales and purchases, but the farmers in our study areas have not yet encouraged their associations to become active in those roles.

Developing cooperative associations might be particularly helpful in our study areas, given the distance to markets, the difficulty of transport, and the perishability of farm produce. Most of the farmers with access to irrigation water grow vegetables for sale in local or regional markets. Many farmers produce the same mix of vegetables and harvest them at similar times. This similarity in production activities can create a glut effect on vegetable prices, as the local supply can increase rapidly in a short amount of time. Lacking storage facilities, and with limited access to market centers, farmer often must sell their produce to middlemen for prices that are lower than they might obtain through a cooperative effort.

Impact Indicator 3

Input prices paid by members and non-members of water user associations

We did not observe any differences in the prices paid for inputs, according to membership in a water user association. In all three study areas, the water user association focuses on water delivery and system maintenance, while not engaging in the purchase of inputs or the sale of output on behalf of the members. The roles of water user associations in the study areas might expand, over time, as farmers gain interest in cooperative marketing activities. However, it is likely that the primary constraints regarding the use of purchased inputs will be the lack of financial credit and the risk of using costly inputs when the amount of water available each season is not guaranteed.

Impact Indicator 4

Current NGO investments directly in water for productive use

The hypothesis motivating the use of Impact Indicators 4 through 6 is that co-investment involving NGOs, communities, and the government will generate conditions in which smallholder households can improve their livelihoods and engage in entrepreneurial activities that provide larger incomes and increase their resiliency.
Impact Indicator 5

Current Woreda budgets for investments in water for productive use

None of the Woreda governments has a budget item for investing in water for productive use. Most of the budgeted funds in each of the study areas are allocated to expenditures on personnel. Representatives of the Woreda governments explained that their budgets are determined by officials in higher level government entities, and the Woredas have little ability or authority to modify the budgets they are given. The representatives also saw little opportunity or incentive to generate funds locally for the purpose of investing in irrigation schemes. Any funds raised by a Woreda government must be provided to the higher level government entities, which might then decide to reduce the Woreda's annual budget by the amount of revenue it generates from local sources. Successful co-investment with Woreda governments might require revisions in the way that Woredas are funded, and the incentive structure regarding the generation and use of revenues collected from households.

Impact Indicator 6

Donor funding commitments, federal government policy, and investment plans for small-scale irrigation and water for pasture

Historically, the Government of Ethiopia has invested more heavily in water for domestic use than water for production, such that the present scale of irrigation development in Ethiopia is limited in comparison with irrigation potential (TANGO, 2010). In recent years, however, the Government has implemented an irrigation development program, with an emphasis on small-scale irrigation systems. The program includes the development of 822 irrigation schemes, on 72,000 hectares, serving 287,000 beneficiaries between 2002 and 2016 within Oromiya, Tigray, and Amhara (TANGO, 2010). The estimated cost of the program, which will include the construction of irrigation and drainage works, and rehabilitation of existing systems, is about $360 million. As of 2007, the Federal Government was implementing only 3 irrigation projects in the region, while two regional institutions had a more active portfolio. The Oromiya Irrigation Development Authority was implementing 154 small-scale irrigation projects, while the Relief Society of Tigray was implementing 717 projects (TANGO, 2010).

Several donor organizations are assisting the Ethiopian Government with its irrigation development program, and have provided nearly half of the program budget from 2005 to 2008 (TANGO, 2010). Primary donors include UNDP, UNICEF, Agence Française de

Donor organizations operating in the Burqitu area have not yet expressed much interest in investing in water for productivity. By contrast, the government has indicated a keen interest in developing greater access to water for livestock and domestic uses. The zonal level Pastoral Development Office already has begun constructing such projects as part of the Fentale Scheme. We understand that the government is eager to obtain co-funding in support of their investment efforts in this area.

The investment situation is somewhat similar in the vicinity of the Abinne 2 site. The zonal level government intends to develop 100 hectares of irrigation by providing a motor pump and constructing primary and secondary canals. The goal is to serve 200 households, thus enabling each to irrigate 0.5 hectares. The government already has constructed a dam on the Bulbula River to support irrigation development and also to reduce demand pressure on the lake that provides water for the Abinne 2 irrigation scheme. Given the aridity of this region and the current demands on water resources, a study of the amount of water available each year would be very helpful before developing plans for further investments in irrigation infrastructure.

Impact Indicator 7

**Woreda capacity to support communities in developing and managing their water resources**

There is limited capacity within government institutions and stakeholder organizations to support communities and advise households regarding water resource development and irrigation strategies. Woreda-level institutions suffer from high employee turnover, low pay, and inadequate training of specialists (TANGO, 2010). Donor organizations have expressed an interest in supporting capacity building efforts, but funds have not always been made available. The effectiveness of water user associations and irrigation cooperatives is limited also by lack of clarity regarding roles and responsibilities in an environment with many organizations operating at local levels (TANGO, 2010). The limited capacity of both government institutions and stakeholder organizations can restrain the success of investments in smallholder irrigation schemes.
Impact Indicator 8

Productive needs and water interests are met (by social group)

Even with irrigation development, water remains quite scarce in each of our study areas. Most households likely would prefer to have additional water and a greater reliability of water supply. In systems that are supplied by a lake or stream, the aggregate amount of water available each season can vary with annual rainfall. In addition, households located further from the head-end of a delivery system have a less reliable water supply than households located near the head-end. Each irrigation scheme serves only a portion of the households in each area, such that non-served households likely represent another source of unmet demand for productive water development. With the possible exception of the Abinne 2 scheme, where Silte households have greater access to irrigation water than Oromo households, we have not observed differences in unmet demands according to social groups.

Impact Indicator 9

Proportion of women in leadership positions in community institutions and their influence on community priorities and decisions

We have observed very limited roles of women in leadership positions in community institutions in our study areas. Women serve as treasurer of the water user associations in Burqitu and Abinne, but no women serve in leadership positions on the water user association in the Shalla District. We understand that the husband of the woman serving as treasurer in Abinne attends WUA meetings in her place. Within the Burqitu District, there are 27 women's associations and cooperatives that focus primarily on credit and other aspects of community support. None of the associations focuses on irrigation.

Impact Indicator 10

Proportion of women in leadership positions and their influence on priorities and decisions in NGOs working on small-scale water resource development for smallholders

The proportions of women serving in leadership roles in the NGOs working in our study areas are quite small. None of the NGOs with whom we visited in the Shalla District employs women in leadership positions at this time. Women are employed as junior-level field staff and in secretarial and other support positions. In the Burqitu District, the
gender officer for AFD is a woman, but she explained that she has very little influence regarding AFD’s priorities and decisions. Fewer than 10% of the SEDA professional staff members working in the vicinity of the Abinne 2 scheme are women.

Impact Indicator 11

Proportion of women in leadership positions and their influence on priorities and decisions in government offices responsible for small-scale water resource development for smallholders

The situation in government offices is similar to that in community institutions and NGOs. Very few women serve in leadership positions with opportunities to influence priorities and decisions. Of the 7 professional staff members in the Shalla Woreda Water Resource Office, the only woman is serving as the secretary. No women are among the six professional staff members of the Burqitu Water and Irrigation Department. Three women serve in the Woreda Cabinet there, but this is likely less than 1% of the membership. We are not aware of any women serving in leadership positions in pertinent government offices in the vicinity of the Abinne 2 scheme.

Impact Indicator 12

Water productivity

Crop yields obtained with irrigation generally are higher than yields obtained in rainfed conditions. Most of the households we have visited report obtaining higher yields of staples and cash crops on irrigated plots. However, many households also report very limited use of the purchased inputs that are essential in achieving even higher yields. Many households cannot afford high quality seeds, fertilizer, or farm chemicals. Input prices are quite high, and even with irrigation, households can experience crop losses if water is not available at the right times and in sufficient amounts to support plant growth and development.

Water productivity – or, more appropriately, agricultural productivity – is limited also by the lack of storage facilities, inadequate transport capability, and limited access to markets that might enable farmers to obtain good prices for all of their produce. Irrigation enhances crop yields, but the marketed portions of those yields are functions of storage and transport capability. The monetary value of agricultural productivity depends on the prices farmers receive for their produce and the proportion of their output that reaches the market in salable condition. Agricultural productivity in our study areas will be notably constrained, even with irrigation, until households also have affordable access to complementary inputs, adequate storage, and efficient transport. They must also have the
ability to sell their produce for attractive market prices, without ceding large portions of those prices to middlemen.

**Impact Indicator 13**

**Household level food security**

Most households in our study areas are challenged to provide year-round food supply, even with irrigation. Large family sizes and the substantial annual variation in crop yields contribute to the challenge of achieving household food security. Many households report that their food stocks provide meals for only a portion of the year, while many also report eating only one or two meals per day.

Many households in the region depend on support from the government's safety net program, which provides limited amounts of food to eligible households. We understand that eligibility depends, in part, on whether or not a household has access to irrigation. With irrigation, a household can lose its eligibility for food supplies from the program. This feature of the program causes stress for some households, given that irrigation is not a guarantee of good yields, particularly when other inputs are not applied.

Also of concern is the fact that many households with irrigation choose to produce vegetables for sale in local markets on their irrigated land, while producing maize in rainfed conditions. If the maize crop fails due to lack of moisture, the households must depend for food security on the revenue they receive when selling their vegetables. Given the difficulty of storing and transporting vegetables to market in a manner that might ensure high prices, households cannot be assured that the revenue they obtain from irrigated plots will be sufficient to purchase their food requirements. Substantial work is needed to determine and evaluate the full range of potential implications on food security of improving household access to irrigation water.

### 2.3. Recommendations for Impact Monitoring

The goals of Oxfam's water intervention program in Ethiopia include improving food security and strengthening rural livelihoods in moisture-stressed areas of three states in Ethiopia. To achieve those goals, households must exercise their rights to access and manage water resources sustainably and equitably, for irrigating crops and raising livestock. Better access, equitable sharing, and sustainable management are essential outcomes that must be achieved along the path to greater food security and more resilient livelihoods.
The theory of change underpinning Oxfam's water program includes the following components:

1. Co-investments and co-decision-making involving NGOs (and CSOs), communities, and governments will promote capacity building in local agencies, enhance knowledge and awareness of water rights and policies, and stimulate formation of community organizations, such as water user associations and marketing cooperatives.

2. Improvements in capacity, awareness, and organization will lead to more equitable access and better governance of water resources, while enabling households to increase productivity and obtain higher revenues for their output, through better access to markets and positive engagements with the private sector in the supply of agricultural inputs and services.

3. The regulatory and institutional framework required to ensure equitable access to water and the fair distribution of water rights can be developed through multi-stakeholder dialogues regarding policy constraints and opportunities, legislative measures, incentives for investment, and the appropriate role of government agencies in supporting the development of smallholder water schemes.

4. Successful implementation of the first three components will produce a new rural landscape in which communities take greater charge of decisions involving water rights and resources, water rights are recognized and protected in law, women's water interests have equal status with those of men, and smallholders gain the confidence and resilience to engage in entrepreneurial activities.

Co-investment and co-decision-making are key elements in this theory of change, as are discussions with many stakeholders at several levels of interaction. It is essential to engage community members, representatives of NGOs, and government officials with local, regional and national responsibilities. Changing perspectives and gaining support for the notions of enabling households to exercise water rights and empowering communities to play larger roles in decisions regarding resource management will require substantial time and effort. Over time it will be helpful to evaluate progress according to selected indicators of desirable outcomes and impacts that will enable continuous assessment of strategies and methods while the long-term program is underway.

Given this distinction between outcomes and impacts, we recommend the following adjustments in the impact monitoring component of Oxfam's water intervention program.

1. Develop a statement of the impact pathway that describes very clearly how investments and activities appearing in the theory of change will result in achieving the goals of the program. The impact pathway will include desirable outcomes such as those appearing in Table 2.3, and it will reflect the important role of complementary programs outside the scope of Oxfam's investments and activities.
2. Determine the investments and activities needed to achieve each of the desirable outcomes and develop indicators for assessing progress toward achievement.

3. Consider whether a larger set of impacts is needed to characterize successful achievement of program goals. For example, it might be helpful to assess the health and welfare of household members, the nutritional balance of household food supplies, and the attendance and performance of children at school.

4. Consider expanding the set of indicators to assess improvements in agricultural productivity and household food security. For example, we might evaluate both the size and stability of crop yields, improvements in livestock health and productivity, the number of meals consumed each day, and the number of months during which a household does not require external food assistance.

2.4. Recommendations for Further Impact Research

While conducting this impact assessment research, Oxfam America and its partners will have notable opportunities to enhance understanding of the importance of water and other inputs in efforts to improve smallholder livelihoods in water-stressed regions of Ethiopia. By establishing groups of panel households and gathering information from them, researchers will learn about the many constraints and opportunities that shape livelihood activities and determine food security within seasons and over time. Some of those constraints and opportunities lie outside the water sector, yet they influence the degree to which interventions pertaining to water and irrigation will enable smallholder households to improve their livelihoods. Researchers can learn also about household perspectives regarding cooperatives that might be formed for jointly purchasing inputs or marketing farm products. They can also engage households in long-term discussion of the best ways to ensure the sustainability of irrigated farming in water-stressed areas. While conducting this research, it will be important also to remain appraised of the investments and activities of other investors and donors that will impact water demands or supplies.

In sum, we propose that researchers gather information and conduct timely analysis in the following four areas of interest:

1. The importance of non-water inputs in agricultural production and marketing in water-stressed areas,

2. Household and local government perspectives regarding measures to increase the likelihood that forming cooperatives will enhance smallholder access to input and output markets,
3. Efforts needed to ensure the sustainability of irrigated farming activities,

4. Information regarding the investment and program activities of the government and non-governmental organizations.

We describe each of these areas of interest in greater detail in the following sections.

2.4.1. The Importance of Non-Water Inputs

Improvements in food security and the strengthening of rural households cannot be achieved through investments in water resources, if other constraints prevent households from using water effectively. Assigning water rights and encouraging rural communities to take greater responsibility for economic development will be helpful in achieving intermediate outcomes, but the long-term impacts of those efforts will depend on the successful achievement of complementary outcomes that lie outside the scope of water interventions. For example, households need affordable access to financial credit, purchased inputs, and training. They also need storage facilities and ready access to active markets when producing perishable vegetables. Oxfam America can greatly enhance the value generated through its water program by recognizing the importance of non-water inputs, and working with households and other stakeholders to remove any binding constraints that prevent households from taking full advantage of improvements in their access to water resources.

The farm-level benefits of irrigation are well known in both industrialized and developing countries. Crop yields generally are larger and less variable, and cropping patterns are more varied, when farmers can supplement rainfall with a reliable supply of irrigation water (Makombe et al., 2007; Gebregziabher et al., 2009). In Ethiopia, smallholder farmers with access to irrigation tend to be more food secure than farmers relying completely on rainfall, but access to irrigation is not a sufficient condition for achieving the full potential of irrigated agriculture. Farmers need access also to extension services, affordable inputs, storage facilities, and output markets within a reasonable distance of their plots (Tesfaye et al., 2008; Bryan et al., 2009; Hanjra et al., 2009). The challenge of ensuring that smallholder farmers have affordable access to several essential non-water inputs might partially explain why the returns to public investments in agriculture often are smaller than investments in roads and schools (Mouges et al., 2008).

Researchers should gather information from panel households describing non-water constraints, as viewed from their perspective. In addition to collecting data describing cropping patterns, irrigation activities, cultural practices, crop yields, and marketing, researchers should inquire about the availability and affordability of complementary inputs, such as modern seeds, fertilizer, farm chemicals, machinery, and credit. They should ask also about the distance and time required to bring farm produce to market, and the challenges or successes that characterize household interactions in market settings. Information describing crop losses due to inadequate storage or inefficient transport also
will be helpful in determining why farm-level yields remain below potential yields, even after farmers gain access to irrigation water.

Researchers should design their questionnaires and other data collection instruments to pursue these issues in substantial detail. They should seek to “dive deeply” into household perspectives regarding non-water constraints that prevent households from achieving their food security goals, even if irrigation water is available. Are households able to plant and bring to harvest the crops they truly prefer? Do they understand sufficiently the agronomic aspects of crop production? Do they have access to adequate amounts of seeds, fertilizer, and chemicals? Do households continue to display risk-averse behavior regarding purchased inputs even after they obtain irrigation? Are their cropping patterns and cultural practices constrained by lack of access to affordable credit? What sources of credit do they utilize, and what rates do they pay? If affordable credit were available, how would they modify their agricultural activities? To what degree has access to irrigation truly improved their livelihoods, and how might that degree change with better access to these non-water inputs?

2.4.2. Household and Government Perspectives Regarding Cooperatives

One hypothesis of the research program is that households will have greater success in obtaining inputs and selling outputs at attractive price points if they form cooperatives that represent them in market transactions. Greater net returns could enable farmers to invest in storage facilities, transportation, and equipment. This hypothesis is sensible, and it is consistent with the views of many researchers, particularly in the context of commercial farming activities in which farmers produce higher valued crops, such as fruits, vegetables, cotton, and coffee (Bernard and Spielman, 2009). However, it is not yet clear if cooperatives will successfully enhance market opportunities for smallholder farmers producing lower valued cereals (Bernard et al., 2008; Bernard and Spielman, 2009). Many smallholders produce limited amounts of output, and the fees for joining cooperatives might exceed the returns they could generate through the coordinated sale of their crops.

Information gathered in this research can enhance understanding of the potential viability of cooperatives in achieving desirable goals in smallholder settings in rural Ethiopia. Researchers should inquire about household perspectives regarding water user associations and other forms of cooperative management and marketing. Do households perceive that they will gain access to markets if they form or join cooperatives? Will membership in well-organized, independent business entities that have bargaining power regarding market prices enable households to invest in storage, transportation, and equipment? If cooperatives are desirable from household perspectives, are there constraints that prevent cooperatives from forming in the study area? If water user associations are already in place and operating successfully, could their remit be extended to include cooperative efforts in input and output markets?

Researchers should inquire also about the interest and capacity of local governments to support the formation of cooperatives. If additional capacity is needed, what form of
capacity-building assistance would be most effective? Is there a minimum level of training required, or is the staffing level of local governments inadequate to engage in the support of cooperatives owned and managed by farmers? Are changes needed in local or national laws regarding formation or membership in farmer-owned cooperatives?

### 2.4.3. Efforts Needed to Ensure Sustainability

Ensuring the sustainability of irrigated farming in an arid region requires the successful matching of irrigation demands with water supplies, and careful management of soil and water quality. Farmers must be motivated to use land and water resources efficiently, as viewed from both near-term and long-term perspectives. In particular, they must perceive correct signals regarding resource scarcity and crop production values, and they must have rights of ownership that encourage them to maintain the productivity of land and water resources, over time. Farmers must also have access to the information and technical assistance they need to implement appropriate management methods. In regions with notable poverty, in which many farm households struggle to achieve food security, it is essential to achieve the right balance between resource scarcity signals, such as prices and allocations, and access to information and technical assistance.

The path toward achieving the sustainability of a water-for-production investment begins with the assessment of potential demands for water in irrigation and livestock watering, and water resource availability. In arid regions of Ethiopia, it is possible that water supplies might not be sufficient to support desirable irrigation investments, even if the investments are targeted primarily toward smallholders. The amount of water available in surface streams and lakes can vary substantially each season with the amount and timing of rainfall. In some years and seasons, water supply might be adequate to support a full community of irrigators and livestock herders, while at other times the supply might not be adequate. In such settings, it will not be sufficient to assign water rights and establish an allocation program. Farmers will need to understand also the likelihood of having enough water at the appropriate times to support successful crop production. It is possible that farmers will continue to operate in a scarcity-driven, risk-averse manner, even after gaining access to water for irrigation.

Information and technical assistance are critical in helping farmers adapt to a production environment in which they will have some amount of irrigation water available in most years. Given that scarcity conditions likely will describe each season, farmers must have the knowledge and methods available to apply irrigation water efficiently, while generating good yields and maintaining healthy livestock. Mintesinot et al. (2004) have shown that farmers in northern Ethiopia can increase maize yields by more than 50%, while reducing water applications by 8% to 18%, if they schedule irrigations in accordance with soil moisture depletion. The corresponding estimates of water productivity increase from about 0.7 kg of maize per cubic meter of water applied, to about 1.4 kg per cubic meter.

Bekele and Tilahun (2006) observe similar opportunities to improve water productivity in the Dire Dawe area of eastern Ethiopia. Smallholder farmers in the region largely use
furrow irrigation with dykes at the end of irrigation runs to prevent surface runoff. Estimates of deep percolation losses range from 21% of applied water on sorghum plots to 83% of applied water on potato plots. Deep percolation is not necessarily inefficient from a basin-wide perspective, as much of the water might return to a shallow aquifer from which residents obtain water for irrigation or livestock watering. However, excessive withdrawals from a lake or stream by some farmers might prevent other farmers along a surface canal system from irrigating their crops in a timely fashion. Excessive application of water also increases the salt load on farm fields, thus potentially threatening productivity if soil salinity is not managed carefully (Samakande, et al., 2004; Wichelns and Oster, 2006). Bekele and Tilahun (2006) recommend construction of small reservoirs or tanks, from which farmers might irrigate their plots using cans, rather than furrows, in an effort to reduce deep percolation.

Encouraging farmers to irrigate more efficiently can be challenging in areas where smallholders have limited access to information and their savings are inadequate for investing in small ponds and other measures that might reduce water losses. Researchers working with panel household members should inquire about their knowledge of irrigation and agronomy, their understanding of water scarcity conditions, and their interest in changing irrigation practices. Do households perceive water scarcity conditions accurately, and do their perceptions influence crop choices and irrigation methods? Do they view water supply as certain or risky? In what ways have their approaches to crop and livestock production changed since gaining access to irrigation water? Has access to irrigation reduced or increased uncertainty regarding their annual income and their sense of food security?

Panel households also can provide helpful guidance regarding interventions that might enhance farm-level irrigation efficiency. Researchers should inquire about the types of information most needed by smallholders and the best ways to provide that information. Would standard forms of extension and outreach services be helpful, or would some other method of conveying information and providing technical assistance be more appropriate? Are there opportunities for cost-sharing programs that might enable households to invest in irrigation equipment or ponds, without needing to wait for many years to accumulate sufficient savings? Would some form of water pricing be helpful to communicate the notion of water scarcity in a village or along an irrigation scheme, or would water allocations be more effective? How do households assess the equity of the current water distribution program, both conceptually and empirically? Do they have recommendations for improving equity or boosting efficiency?

2.4.4. Learning of the Investments and Programs of Others

In areas with limited water resources, it is essential also to know the irrigation investment plans of other NGOs and government agencies. Scarce supplies in arid regions can easily be exhausted if the number of irrigators exceeds the level that might be sustained in a carefully managed program of water withdrawals. In some areas, one or two commercial farming operations can draw down the available water supply very quickly, thus possibly preventing smallholders from obtaining irrigation water at critical stages of plant growth.
and development. In theory, a well-defined system of property rights to water should prevent such conflicts. However, it is essential to limit the number of water rights to the amount of water available, and to define the rights in terms of proportions of the amount of water available each season. The rights must also be successfully enforced.

Given the essential role of complementary inputs and the importance of access to markets, Oxfam must become aware of any investment programs that will enhance these features of the agricultural environment in water-stressed areas. The impacts of irrigation investments will be limited in areas where complementary inputs are unavailable or unaffordable, and where farmers must struggle to market just a portion of the cash crops they produce. If investment plans are not evident, it might be necessary to revise Oxfam's planned interventions accordingly. Perhaps Oxfam can assist in motivating NGOs or the government to undertake supportive investments. If not, it might be necessary to include a broader scope of activities within Oxfam's investment portfolio.

2.4.5. Summary

In sum, we view the panel household component of this impact assessment research as having five objectives:

1. To obtain information describing the smallholder livelihood impacts of gaining access to irrigation water,
2. To learn about the implications of non-water constraints and opportunities on household choices and activities,
3. To gain insight from households, regarding how water intervention programs might be adjusted to better reflect the implications of non-water constraints,
4. To learn about household perspectives regarding cooperatives that might be formed for purchasing inputs or marketing farm products, and
5. To engage households in discussion of measures needed to ensure the sustainability of irrigated farming activities in water-stressed areas.

Successful interaction with panel households during the course of this impact assessment research will generate a wealth of information on these critical issues. The information will enable researchers to adjust the parameters of Oxfam America’s water program, while the program is underway. In addition, the insights that researchers gain from panel households will enhance their understanding of binding constraints and unrealized opportunities in ways that might not have been possible without engaging in sustained discussions with residents of the study area. This remarkable opportunity should motivate researchers to design panel household instruments and conduct their interactions in ways that not only facilitate data gathering, but also encourage household members to describe the implications of non-water constraints, discuss issues such as cooperatives and
sustainability, and provide critical insight regarding helpful adjustments in the design of intervention programs.

To ensure success of the panel household component, it will be essential to maintain timely contact with each household. While conducting the baseline assessment, we have provided each household with a notebook and pen, and we have started the process of engaging them in long-term data collection. It is essential to visit with each household on a regular basis to ensure they understand the program, and they feel as though they are a critical part of an important research effort. The data tables we present in this report generally reflect the information we have collected from the panel households. That information can be enhanced substantially over time, by developing a detailed data collection format that panel households can use to record observations as they are generated.

The panel household component should be viewed as a special opportunity to gain insight regarding the issues, constraints, and opportunities that households face as they endeavor to achieve food security. Researchers can begin by first inquiring about household perspectives regarding food security. What does this concept truly involve at the household level? How do households assess their food security status? How does the goal of achieving food security fit within other household objectives? Do households perceive a realistic possibility of becoming food secure at some time in the future, or do they expect to remain insecure in perpetuity? Do households receive sufficient food aid from the government? Do restrictions of the food aid program influence household decisions regarding crop and livestock production? Is there a direct or inverse relationship between the amounts of food aid a household receives and the amounts of agricultural output it generates?

In sum, there is much to learn from the panel households, and a carefully crafted research design will maximize the value of this remarkable opportunity.

2.5. Conclusion

Enabling farmers to reach the threshold of productivity at which they can achieve and sustain food security and begin generating a surplus in some years will require substantial effort. Uncertainty regarding hydrographic and environmental constraints, risks pertaining to household investments and changes in livelihood strategies, and the current lack of access to farm inputs, markets, and infrastructure will complicate efforts to enhance rural livelihoods throughout the course of Oxfam’s water program. It is critical that Oxfam monitor federal and regional investment plans and policy adjustments, while advocating for an appropriate water rights codification system. Such a system must ensure equitable access to water resources, while accounting for annual and seasonal variability in water supplies. Local governments and water user associations should promote the wise management of water resources, with the goal of enhancing livelihoods in sustainable fashion, while also maintaining and enhancing environmental quality.
To achieve the long-term goals of its water program, while also enhancing understanding of these complex and challenging issues, we recommend that Oxfam consider conducting the following activities:

1. Review current investment plans for water-stressed areas in the region of Oxfam’s program, and develop a keen understanding of the hydrographic and environmental studies completed in support of those plans;

2. Take a clearer position regarding the conditions under which Oxfam is willing to co-invest in small-scale water systems, and state those conditions very clearly and transparently in every negotiation (e.g., when discussing co-investment plans with the government, and when addressing issues such as access to input and output markets);

3. Give greater attention in feasibility studies and in project baselines to the availability of water resources from a hydrographic perspective, and assess the possible long-term environmental impacts of interventions, while ensuring also that Oxfam has the necessary expertise for preparing these studies; and

4. Stimulate the sustainability debate at the federal level, relying on valid, case-based evidence (developed through grassroots projects), combined with broader hydrologic, agronomic, and policy analysis.
3. Annexes

3.1. Stakeholder Consultation and Research Design

With the goal of developing a robust research methodology with input from many interested parties, we consulted stakeholders at several levels. We conducted two workshops and we consulted with representatives of NGOs as we developed our questionnaire and began working with communities in the field. We received helpful input from stakeholders regarding our assumptions and our perspectives regarding impact indicators.

Research Consultative Workshop

About 64 participants convened in Addis Ababa on the February 22 and 23, 2010. Oxfam America invited stakeholders who were to look at the theory of change and map this out on the focal areas for Oxfam America’s Water Program for the next 10 years. According to the proceedings report, the ‘purpose was to create a space where the key stakeholders would be prodded to actively listen to each other, learn and appreciate the differences in perspectives, and discover common ground and commitment for developing productive opportunities for smallholders through building water systems based on co-investment.’

The approach taken in the facilitation of this workshop departed from the traditional hierarchal (re)presentation and linear way of organizing a workshop in Ethiopia. Instead of handling topic by topic and using expert-driven PowerPoint presentations as the fuel for discussion, a more circular or iterative design was applied around the 4 central themes: (1) change landscaping; (2) stakeholder roles; (3) impact measurement; and (4) co-investment.

The workshop involved representatives from the Federal Government and the Regional Governments of Amhara, Oromia and Tigray. Departments and offices dealing with water and land resources were also represented from these tiers of governance. The Non-governmental Organizations also participated in this workshop. These included most of the Oxfams working in Ethiopia; other partner NGOs working in Ethiopia. The three partner NGOs in the three baseline study sites in Ethiopia were also represented during this workshop.

Farmers and Water User Associations were also represented in this workshop since the issues being discussed would directly impact on their livelihoods. The intention was to engage key stakeholders in discussions of what the baseline was going to focus on. To facilitate a clear understanding by all the participants in the workshop the languages of communication were Amharique and Oromifa. This enabled better understanding of the issues being discussed by all stakeholders.
Consultation with Partner NGOs

The three partner NGOs were further consulted in the field prior to beginning the field research. The research team had about five days at each research site, so the field based implementing NGO staff were instrumental in organizing field logistics. The consultation was also aimed at clarifying the fact that the baseline was meant to inform the Water Program and was not intended to be an evaluation of the performance of the individual NGO partner. Despite making this clear at the outset, implementing partner NGOs seemed inclined on viewing the baseline study as an assessment of their individual performance.

Participants at the consultation workshop largely endorsed the 13 impact indicators and the suggested adding a 14th indicator on health. We did not include the indicator on health in this baseline study, but we propose considering improvements in household health and welfare to be among the long-term impacts we hope to achieve by 2020. The research questions pertaining to each of the 13 impact indicators are presented in Annex A.

Validation Workshop

The validation workshop was conducted in Addis Ababa on June 7, 2010. The primary goal of the workshop was to present our findings and receive comments from stakeholders regarding whether or not the findings are consistent with their understanding of key issues and constraints in the three case study sites. About 40 participants attended the workshop, including representatives from the Federal, regional, and local governments, Oxfam partners, NGOs, and the communities in which the baseline study was conducted. This workshop was conducted in the local languages of Amharique and Oromifa, to facilitate better understanding of the Baseline Study findings. The participants validated the research findings, as described in the Workshop Proceedings (Annex B).

Research design meeting with Oxfam

On February 8 and 9, 2010, IWMI researchers met in Addis Ababa with researchers from Oxfam America, to discuss the design for this study. We chose 13 impact indicators and discussed the types of information we needed to collect in the field. The 13 indicators are depicted in Figure 3.2.

Following the consultation workshop in February 2010, we discussed the research design further with the Oxfam America team. Our discussions focused largely on refining and elaborating the list of evidence we would collect in the field study. Given the amount of time and resources available, we chose to work in three study areas. The sites are described in Table 3.2.

We chose the study sites to represent three stages of irrigation development. The Golba Girisa small-scale irrigation scheme in the Shalla District is in the pre-feasibility stage of project design. The Burqitu Water Supply and Micro-Irrigation scheme (Duga Dawa Woreda) is in its second year of operation. The Abinne 2 small-scale irrigation scheme in Adamitulu Jido Kombolcha Woreda has been operating for five years.
Figure 3.2. Impact Indicators Pertaining to the Co-Investment System

The Core Value Proposition of the Water Program that needs a baseline:

Co-Investment System

8. Productive water needs & interests met (by social group)

11. % leadership positions in local and regional Gov offices and influence on priorities/decisions

5. Current woreda budgets from the region for “water for production”

6. Amount $ from all donors and federal government policy & investment plans for small-scale irrigation and water for pasture

7. Woreda capacity to support communities in developing and managing their water resources

1. Equitable Access to productive opportunities related to land & water

Woreda Region Gov Donors

Community

12. Water productivity

13. Household Food Security

2. Farm produce prices / nearest market prices

3. Input price paid by WUA and non-WUA farmers

4. Current NGO investments directly in “water for productive use” (hard & softeware)

10. % leadership positions in NGOs and influence on priorities/decisions

Page 35
<table>
<thead>
<tr>
<th>Name and Location</th>
<th>Age and Status</th>
<th>Initiator</th>
<th>Livelihood System</th>
<th>Technology</th>
<th>Community organization</th>
<th>Market Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golba Girisa, Shalla Woreda, Rift valley, Oromiya</td>
<td>Two months (pre-feasibility study)</td>
<td>CDI (local NGO)</td>
<td>Agro-Pastoralist</td>
<td>Gravity irrigation (multi-purpose)</td>
<td>Traditional</td>
<td>45 kms (Shashamene)</td>
</tr>
<tr>
<td>Abinne 2, Adamitulu Jido Kombocha Woreda, Rift Valley, Oromiya</td>
<td>5+ years (production phase)</td>
<td>SEDA (local NGO)</td>
<td>Agriculturalist</td>
<td>Pump irrigation, (multiple irrigation units)</td>
<td>Cooperative</td>
<td>5 to 6 kms (Zoa)</td>
</tr>
<tr>
<td>Burqitu, Dugda Dawa Woreda, Borena, Oromiya</td>
<td>2 years (production phase)</td>
<td>AFD (local NGO)</td>
<td>Pastoralist</td>
<td>Spring development (multiple purpose)</td>
<td>Water User Association</td>
<td>40 kms (Yabelo)</td>
</tr>
</tbody>
</table>
3.2. Process, Methods and Findings of the Primary Field Study

3.2.1. Research Process, Methods, and Fieldwork Schedule

Preparation

After organizing the workshop on February 22 and 23, 2010, Oxfam America was instrumental in helping shape the research instruments. In consultation with researchers from Oxfam America, IWMI researchers finalized the research questions and tools after distributing draft versions for comments and suggestions.

Oxfam America contacted the partner NGOs in the field to make arrangements for the field work. The partner NGOs were instrumental in contacting the respondents at each of our research sites. It was agreed that about 5 days would be spent at each site to interview residents and key informants, and conduct focus group discussions. The field data collection schedule is presented in Table 3.2 We largely followed that schedule, with one exception. Field conditions made it necessary that we begin data collection in Shalla. We then traveled to Dugda Dawa (Burqitu Magada), before completing our fieldwork at the Abinne 2 scheme.

Research Design

The selection of three case study sites for conducting the baseline study was largely based on criteria established in consultation with Oxfam researchers. The study sites include one in which the irrigation investment is currently undergoing feasibility analysis (Hargago, in Shalla Woreda), one in the second year of implementation (Burqitu, in Duga Dawa District), and one in the fifth year of implementation (Abinne 2). We chose study areas with projects in various stages of development with the hope of discovering different perspectives regarding key issues in the baseline study.

The study sites also reflect different areas of emphasis regarding productive water interventions. The proposed Hargago irrigation scheme in Shalla Woreda will enhance a system that the community constructed on its own, and currently manages as a traditional, informal irrigation scheme. The primary focus in Hargago is crop production. The investment in Burqitu in Duga Dawa is largely based on a multiple use system that includes irrigation, livestock watering, and domestic water use. In the Abinne 2 scheme, small-scale farmers receive irrigation water diverted by communal pumps from a nearby lake.

Research Methods

We reviewed several reports provided by Oxfam America, including the TANGO Report, a theory of change document, and other unpublished reports. We also examined several reports regarding the general notion of a theory of change in the context of international development. This enabled the research team to understand the theory of change as applied by other donors and NGOs.
We consulted literature also to gain a better understanding of the Oromia Region and to learn about current practices in crop and livestock production. Pastoralism is an important livelihood activity for many households in the Oromia region, especially in areas near the border with Kenya.

**Training of Research Team**

The research team conducted a one-week training session to familiarize members with the 13 impact indicators and the proposed data collection methods. The training was conducted at the International Livestock Research Institute Campus in Addis Ababa for the two researchers and the two documenters hired for the fieldwork. Everyone hired for the study were fluent in Oromifa, the language spoken in all the three case study sites. All discussions with community members were conducted in the Oromifa language. The research team included experienced anthropological and sociological experts, who emphasized the need to gather both qualitative and quantitative information.

**Key Informant Interviews**

We conducted key informant interviews at several levels. We began by interviewing members of partner NGOs in the field. This was usually the first interview conducted at the study sites, and it provided a helpful overview of each site before field work began. This interview also enabled us to identify other NGOs working in the area. The format of the interview was semi-closed. This helped us gain a better understanding of the different project sites and the challenges requiring attention at each site. Such interviews helped provide information on other indicators, also, such as gender and NGO investments in water for productive purposes.

We also interviewed leaders in the communities. These included the Kebele (ward) Chairperson, the leader of the water user association, women leaders, women who were members of the water user associations or other clubs and associations. These were largely at the community level. At times we interviewed other individuals, also, such as farmers who were identified as those who had been particularly successful.

We conducted interviews also with government officials at the Woreda, zonal (regional level) and federal levels in departments charged with water resources, agriculture, pastoral affairs, cooperatives, NGO affairs, finance, revenue, and administration. In addition, we conducted informant interviews with NGOs and donors in Addis Ababa. With donors we learned of their current funding priorities, while with NGOs, we learned of their understanding of co-investment and the role of women in their organizations.

**Transect walks**

We began our investigation of each study site with a transect walk that enabled us to gain a first-hand overview of the area and allowed us to observe some of the intervention activities we would later discuss with members of the community. We walked as a group across the intervention area with a few knowledgeable people from the local community. During the
walk, we sketched an outline of the area and noted the crops being grown. We also discussed and noted pertinent historical information. This was helpful in gaining a general impression of the research site. We pursued some of the issues we observed during the transect walks in our interviews with key informants and in focus group discussions.

**Historical Timelines**

We established historical timelines describing the sequence of key events and developments in each study area. Most of the timelines begin with the period of Emperor Haile Selassie’s rule and continue through the period of the Derg under Mengistu, concluding with the current rule of the Ethiopian People’s Revolutionary Democratic Party. We noted important changes in livelihoods along the timeline, as described by community members. We also noted major events, such as the devastating drought in 1984 and 1985, and the transition from pastoralism to crop farming. The facilitators assisted in probing participants for details regarding key elements of the historical timelines.

**Focus Group Discussions**

We conducted focus group discussions in which we asked several community members to consider selected issues pertaining to our impact indicators. The focus groups were facilitated in a participatory manner to encourage residents with different degrees of social status to contribute freely. We conducted focus group discussions with a variety of participants, with the goal of triangulating the information we received. For example, we conducted sessions with women residents, male residents, mixed gender groups, and members of water user associations.

**Wealth Ranking**

We conducted a wealth ranking in each area, as part of our assessment of food security. The wealth ranking, as determined by community members, provided the strata from which we selected the panel households for interviews.

**Panel Households**

One goal of our study is to establish a foundation upon which Oxfam can systematically monitor the impact of its water for productive use interventions at the household level for 10 to 12 years. To this end, we selected 12 households for panel interviews. Two of the households were selected from those classified as well off, two were considered not-so-well off, two were selected as members of water user associations, and two were considered to be non-members of water user associations. We also selected two households headed by women and two headed by men, thus completing our set of 12 households.

Our goal in conducting 12 panel household interviews was to obtain more detailed information regarding the 13 impact indicators that we might obtain during focus group discussions. The approach also provides more detailed information regarding each household and it provides the opportunity for monitoring changes in household welfare over time. To
that end, we provided each household with notebooks for recording information pertaining to impact indicators. This will enable us to observe and evaluate changes over time in different types of households.

**Field Research Challenges**

We began our fieldwork in early April, which was somewhat challenging, given that national elections had been scheduled for May. This timing caused some respondents to be very cautious about their responses. Issues such as water rights were sensitive, in part, because the government had passed legislation barring most external NGOs from focusing on rights issues. It was also difficult to meet with all key informants in the field within the five days we had allocated for each study site, because many of the senior officials had been assigned to participate in political campaigns.

The time allocation of five days per research site was too short to enable in-depth analysis of all important issues. We were notably challenged to conduct the key informant interviews, convene and conduct focus groups with community members, and visit with all of the panel households during our five-day schedules.

3.2.2. Findings of the Primary Field Study

**General Comment**

The partner NGOs tended to view the baseline study as an evaluation of their performance. Hence they tried to portray a positive image of what was occurring on the ground at each study site. However, for a baseline study, failures and challenges provide useful information when establishing benchmarks to be used in evaluating progress during the next ten years of Oxfam's water intervention program. It is essential that partner NGOs understand the purpose and scope of a baseline study and subsequent efforts to monitor progress toward achieving desirable outcomes and impacts.

**Specific Findings Regarding the Thirteen Impact Indicators**

1. **Equitable Access to productive opportunities related to land and water**

   **Gender issues**

   Gender is a key component of the theory of change that underlies Oxfam America's water investment program in Ethiopia. At project level gender is still a function of the social and cultural context under which projects are being implemented. Women in leadership positions are positively contributing to development issues in their area. However, there is an honest admission that their contribution often takes a subsidiary role to the men. Currently major gender changes are largely foreseen in the long run due to the limited project lifecycle. There is need for “ongoing post-project support to ensure that the water
and co-investment systems are durable” (see report on the stakeholder consultation workshop, page 6). This is what distinguishes a program approach from a project approach. Partner NGOs also should begin thinking of this effort as a long-term program.

At the program level, gender participation within the water program is currently low. At the partner NGO level, gender policies are in place, but implementation is still very low. While there seems to be an understanding of gender issues among the NGOs, and they provide staff training on gender, the numbers of women in leadership positions are quite small, and it may take substantial time to change attitudes and behavior regarding gender balance and equity within these organizations.

2. Farm produce prices, nearest markets, and price discovery

   **Low Prices and Poor Market Linkages**

   Markets are not yet well integrated into the production system. The lack of storage facilities forces many farmers to sell their produce at low prices before it spoils. The middlemen (*Dalala*) exploit such vulnerability of the poor farmers. If possible, farmers might consider engaging in value-added activities, with appropriate technical support and if they have sufficient access to loans for investing in new small-scale ventures, Linkages with the private sector might be very helpful in this regard.

3. Input prices paid by members and non-members of water user associations

   **There were no significant advantages of being a member of a WUA**

   Membership in water user associations did not reduce the cost of inputs. In the absence of organized marketing strategies, members also do not benefit by receiving higher market prices for their output. In sum, we observed no significant advantages of being a member of a water user association. The historical experience with cooperatives during the socialist Derg government has negatively influenced the enthusiasm of farmers to organize themselves in cooperatives.

   **Water User Associations lack capacity**

   We observe that the water user associations generally are somewhat weak, in terms of capacity and basic skills, such as bookkeeping. Also, most members do not understand the rules and regulations governing their association. Enforcement of the rather fuzzy rules also is weak. We observed no marketing skills or any interest in the notion of value addition involving irrigated crops.

4. Current NGO investments directly in “water for productive use”

   **Very few NGOs are investing in irrigation schemes**
Most NGOs refrain from investing in the irrigation sector. While capacity is one of the reasons, most NGOs respond to donor priorities that include the provision of domestic water and water for livestock, while expressing much less interest in providing water for irrigation.

Several NGOs provide capacity training, specific to irrigation, and regarding institutional development in general. However, this form of intervention needs substantial support.

5. Current woreda budgets in the region for “water for production"

Co-investment is currently feasible with communities, but not with woredas

The idea of co-investment seems to be recognized largely at the project site level. This has traditionally been conducted through labor provided for construction and maintenance by local communities. At the woreda (district) level the potential is through the line ministry staff time contribution. However, the likelihood of obtaining funds for co-investment from woreda governments is small for several reasons:

1. Woredas currently receive their budgets from the regional government, which allocates funding based on criteria that reflect population size and development priorities;

2. In all districts, more than 90% of woreda budgets are allocated to staff salaries, even though staffing levels are only 50% of the levels desired by woreda leaders;

3. Woredas do not have autonomous discretion regarding their expenditures;

4. Revenues generated locally must be delivered to the regional level. Hence, there is no link between locally generated revenue and local expenditures. Partly for this reason, most woredas raise very little revenue to supplement their budgets.

To increase discretionary financing at the woreda level, Oxfam America must engage with high level tiers of governance at the regional and federal levels. Unless changes are made at those levels, woredas will remain as conduits for implementing decisions that are largely determined at higher levels. Efforts to broaden the woreda level tax base will not enhance the ability of woredas to invest in water for production.

6. Donor funding commitments, federal government policy, and investment plans for small-scale irrigation and water for pasture

The Federal and Regional governments in Ethiopia have developed ambitious plans to invest in both small scale and large-scale irrigation projects
Most donors express little interest in investing in water for productive use. Several reasons were offered to explain this low level of investment. Irrigation is considered a specialized area of investment that requires technical skills. Also, most donors work on specific priority areas that have been developed jointly with the government, as a mechanism of coordinating donor activities in Ethiopia. Only a few donors, such as IFAD, have gained expertise in the irrigation sector. In addition, irrigation investments are viewed as interventions requiring large amounts of capital and other resources. Yet the potential returns on investment in irrigation are viewed as quite small, and they are offset by concerns regarding sustainability. Investments in irrigation are seen also as having transboundary implications. Hence, some donors choose not to become involved in this sector. Some donors prefer to provide support through transboundary and river basin initiatives, such as the Nile Basin Initiative (NBI).

7. **Woreda capacity to support communities in developing and managing their water resources**

   *Woredas have limited capacity to support communities in water resource management*

   Woredas are empowered to support development within their areas of jurisdiction. However, due to lack personnel and resources, most woredas are unable to meaningfully support investment efforts in local communities.

8. **Productive water needs and interests are met (by social group)**

   Water needs generally are met, but ethnic issues appear in some areas. For example, in the Abinne 2 scheme in Zway, the Oromos claim that the Silte receive greater benefits from irrigation because they are given greater access to water resources. The Silte are originally from the Southern Peoples Nations and Nationalities (SPNN) region, and they were eager to support irrigation development and take delivery of water when the project was first developed. The Oromos, by contrast, were slower to accept the notion of supporting irrigation development.

   Although there have been attempts to include women as part of the beneficiaries of irrigation projects, we observed no evidence regarding their involvement in the design of irrigation projects. We perceive that all NGOs attempt to be as inclusive as possible.

9. **The proportion of women in leadership positions in community institutions and influence on community priorities and decisions**

   *Women's roles in leadership positions are largely symbolic*

   Women participate in community institutions and organizations such as water user associations and Kebele cabinets. However, most of the women we interviewed reported that they did not contribute meaningfully to decision making. We understand that some of the women in leadership positions are taken less seriously than their male colleagues.
10. The proportion of women in leadership positions and their influence on priorities and decisions in NGOs working on small-scale water resource development for smallholders

*We have observed little evidence of women participating in such roles in NGOs*

Representatives of the NGOs we interviewed seem to understand the importance of addressing gender issues, yet there is little evidence of women serving in leadership positions. Some government departments hire more women than many of the NGOs we interviewed (both partner and non-partner organizations).

11. The proportion of women serving in leadership positions and their influence on priorities and decisions in government offices responsible for small-scale water resource development for smallholders

*Some women serve in leadership positions, but they lack authority and influence*

Regional and federal governments have increased their hiring of women. However, most of the positions are symbolic and do not reflect meaningful authority. Both male and female civil servants have reported this to us.

12. Water productivity

*There is inefficient use of water for irrigation*

Although irrigated areas are more productive than non-irrigated areas, much work is needed to increase agricultural productivity by ensuring that water and other inputs are applied at correct times and in the right amounts. It is also essential to ensure that households have timely affordable access to complementary inputs and to viable markets in which they can obtain reasonable prices for their output.

13. Household Food Security

*Livelihoods have improved with irrigation interventions*

Investments in irrigation and other donor interventions have improved food security in all the case study sites. However, the issue of market linkage seems not to have been considered in most of the interventions. With irrigation, many households produce similar crops that ripen at the same time, thus causing a glut of perishable crops in the market. The resulting low prices limit farm incomes and constrain household ability to purchase food supplies. Producing the same crops also places pressure on limited water supplies, as many farmers need water at the same time. This can generate conflicts regarding water allocation during peak water demand periods.

Despite the enhancements achieved with irrigation, most households in the study areas are food insecure. Even with irrigation water available, plot sizes are small and yields
remain uncertain due to the vagaries of weather and the inability to purchase and apply correct amounts of complementary inputs.

A Note Regarding Technology

Technology needs to be appropriate for sustainability

The technology involved in irrigation interventions must be understood by local farmers, who must respond effectively when equipment fails. When the water pump in Abinne failed, the farmers were unable to raise the funds required for repair. If irrigation equipment cannot be repaired or replace readily, farmers bear a substantial risk of losing their harvest, with potentially serious implications for household incomes and food security.
Table 3.2. Schedule of Field Research Activities, April 6 to April 22, 2010

<table>
<thead>
<tr>
<th>Site</th>
<th>Day and time of day</th>
<th>Target Group</th>
<th>Tools</th>
<th>Remarks</th>
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<tr>
<td>Shalla/1.Hargago 2. Bura gara</td>
<td>Morning</td>
<td>Travelling</td>
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<td></td>
<td>Afternoon</td>
<td><strong>Heads of Woreda Administration (all), Women in the Women Affairs office, Agriculture and Rural Development office (Irrigation Desk, Water supply, Natural Resource Department, Land use and administration department), Finance and economic Development office, Revenue office, Woreda Administration cabinet (both females and males), Women Team leaders, NGOs Affairs office, Food security Task Force.</strong></td>
<td>Semi-structured Interviews, Observation documents/review</td>
<td>2 or 3 offices per team, Copies of relevant documents, Woreda organogram</td>
</tr>
<tr>
<td>Shalla/1.Hargago 2. Bura gara</td>
<td>Morning</td>
<td>Woreda Level interviews</td>
<td></td>
<td>If some not covered on Day 1</td>
</tr>
<tr>
<td></td>
<td>Afternoon</td>
<td>Leaders/members of WUA, Goxi, Kebele, Gare as well as DAs, (at least 1 female)</td>
<td>Transect walk and institutional mapping</td>
<td>2 Transact walks by the 2 groups</td>
</tr>
<tr>
<td>Shalla/1.Hargago 2. Bura gara</td>
<td>3</td>
<td>Morning</td>
<td>WUA Committee members, Union members/leaders, Members of Milk Collection Center, Micro-enterprises, female headed households, Farmer Training Centers</td>
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<td></td>
<td>Women in Leadership positions, CBO (idir leaders), Kebele Youth Associations Goxi (goti) and Gare leaders, Kebele leaders, DAs (Irrigation expert, agronomist, Natural resources expert), Health extension (Veterinarian and Human Health)</td>
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<td></td>
<td>Afternoon</td>
<td>Interviews</td>
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<tr>
<td>Shalla/1.Hargago 2. Bura gara</td>
<td>4</td>
<td>Morning</td>
<td>1.Mixed group (gender, leaders, despised groups, landless, different, economic status, religion, ethnic group, members of associations, unions etc), 2.Women (mixed irrigated and non-irrigated households,</td>
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<td>Focus group discussions (FGD, 12 per group)</td>
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<td></td>
<td></td>
<td>Afternoon</td>
<td>1. WUA Committee 2.Female headed households (mixed irrigated and non-irrigated)</td>
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<td>Focus Group Discussions</td>
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<td>Two teams each doing at least one FGD (Possibly interviews, Panel interviews after FGDs)</td>
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<tr>
<td>Location</td>
<td>Time</td>
<td>Activity</td>
<td>Contact</td>
<td>Notes</td>
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<tr>
<td>Shalla/1.Hargago</td>
<td>Morning</td>
<td>Households</td>
<td>Panel Households</td>
<td>Wealthy status (high income x 2 and low income x 2) WUA membership</td>
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<tr>
<td></td>
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<td></td>
<td>(irrigation, non-irrigation) Type of households (gender)</td>
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<td><strong>Total of 18</strong></td>
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<td></td>
<td>Afternoon</td>
<td>NGOs, Private sector</td>
<td>Interview</td>
<td></td>
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<tr>
<td>Abinne 2 SSI</td>
<td>Morning</td>
<td>Travelling</td>
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<td></td>
<td>Afternoon</td>
<td><strong>Heads of Woreda</strong></td>
<td>Semi-structured interviews, Observation documents/review</td>
<td>2 or 3 offices per team</td>
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<tr>
<td></td>
<td></td>
<td><strong>Administration (all),</strong></td>
<td></td>
<td>Copies of relevant documents, Woreda organogram</td>
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<td></td>
<td></td>
<td>Women in the Women Affairs</td>
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<td></td>
<td>Office, Agriculture and Rural</td>
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<td></td>
<td>Development office</td>
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<td>(Agro-pastoral unit, Irrigation</td>
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<td>Desk, Water supply, Natural</td>
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<td>Resource Department, Land</td>
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<td>use and administration</td>
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<td>department)</td>
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<td>Finance and economic</td>
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<td>Development office, Revenue</td>
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<td></td>
<td>office, Woreda</td>
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<td>Administration cabinet</td>
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<td></td>
<td>(both females and males), Women</td>
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<td>Team leaders, NGOs Affairs</td>
<td></td>
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<td></td>
<td></td>
<td>office, Food security Task</td>
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<td></td>
<td>Force.</td>
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<tr>
<td>Abinne 2 SSI</td>
<td>7</td>
<td><strong>Morning</strong></td>
<td>Woreda Level interviews</td>
<td>If some not covered in Day 1 (Team to make decision if there are more than 2 WUAs)</td>
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<tr>
<td><strong>Afternoon</strong></td>
<td>Leaders/members of WUA, Goxi, Kebele, Gare as well as DAs, (at least 1 female)</td>
<td>Transect walk and institutional mapping</td>
<td>2 Transact walks by the 2 groups</td>
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<tr>
<td>Abinne 2 SSI</td>
<td>8</td>
<td><strong>Morning</strong></td>
<td>WUA Committee members, Union members/leaders, Members of Milk Collection Center, Micro-enterprises, female headed households, Farmer Training Centers, Women in Leadership positions, CBO (idir leaders), Kebele Youth Associations Goxi (goti) and Gare leaders, Kebele leaders, DAs (Irrigation expert, agronomist, Natural resources expert), Health extension (Veterinarian and Human Health)</td>
<td>Interviews</td>
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<tr>
<td><strong>Afternoon</strong></td>
<td></td>
<td></td>
<td>Interviews</td>
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</tr>
<tr>
<td>Abinne 2 SSI</td>
<td>9</td>
<td>Morning</td>
<td>1. Mixed group (gender, leaders, despised groups, landless, different, economic status, religion, ethnic group, members of associations, unions etc), 2. Women (mixed irrigated and non-irrigated households),</td>
<td>Focus Group Discussions (12 per group)</td>
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<td></td>
<td>Afternoon</td>
<td>1. WUA Committee 2. Female headed households (mixed irrigated and non-irrigated)</td>
<td>Focus Group Discussions</td>
<td>2 Teams each doing at least one FGD (Possibility of interviews, Panel interviews after FGDs)</td>
</tr>
<tr>
<td>Abinne 2 SSI)</td>
<td>10</td>
<td>Morning</td>
<td>Households</td>
<td>Panel Households</td>
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<td></td>
<td>Afternoon</td>
<td>NGOs, Private sector</td>
<td>Interview</td>
<td></td>
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<tr>
<td>11</td>
<td>Traveling (Entire day)</td>
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<tr>
<td>Dugda Dawa (Burqitu Magada)</td>
<td>12</td>
<td>Morning</td>
<td>Heads of Woreda Administration (all), Women in the Women Affairs office, Agriculture and Rural Development office (Irrigation Desk, Water supply, Natural Resource Department, Land use and administration department), Finance and economic Development office, Revenue office, Woreda Administration cabinet (both females and males), Women Team leaders, NGOs Affairs office, Food security Task Force.</td>
<td>Semi-structured Interviews, Observation documents/review</td>
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<td></td>
<td></td>
<td>Afternoon</td>
<td>Woreda Level interviews</td>
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<tr>
<td>Dugda Dawa (Burqitu Magada)</td>
<td>13</td>
<td>Morning</td>
<td>Leaders/members of WUA, Goxi, Kebele, Gare as well as DAs, (at least 1 female)</td>
<td>Transect walk and institutional mapping</td>
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<tr>
<td>Afternoon</td>
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<td></td>
<td>WUA Committee members, Union members/leaders, Members of Milk Collection Center, Micro-enterprises, female headed households, Farmer Training Centers</td>
<td>Interviews</td>
</tr>
</tbody>
</table>

<p>| Dugda Dawa (Burqitu Magada) | 14 | Morning | Women in Leadership positions, CBO (idir leaders), Kebele Youth Associations Goxi (goti) and Gare leaders, Kebele leaders, DAs (Irrigation expert, agronomist, Natural resources expert), Health extension (Veterinarian and Human Health) | Interviews                   |                                    |
| Afternoon                    |    |         | 1.Mixed group (gender, leaders, despised groups, landless, different, economic status, religion, ethnic group, members of associations, unions etc), 2.Women (mixed irrigated and non-irrigated households | Focus Group Discussions (12 per group) | 2 teams                          |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Activity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>Dugda Dawa (Burqitu Magada)</td>
<td>1. WUA Committee</td>
<td>1. WUA Committee</td>
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<tr>
<td></td>
<td></td>
<td>2. Female headed households (mixed irrigated and non-irrigated)</td>
<td>Focus Group Discussions</td>
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<td></td>
<td>2 Teams each doing at least one FGD</td>
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<td></td>
<td>(Possibility of interviews, Panel interviews after FGDs)</td>
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<td></td>
<td></td>
<td>Afternoon</td>
<td>Households</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Panel Households</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Wealthy status (high income x 3 and low income x 3)</td>
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<td></td>
<td></td>
<td>WUA membership (irrigation, non-irrigation)</td>
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<td></td>
<td></td>
<td></td>
<td>Type of households (gender)</td>
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<tr>
<td></td>
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<td>Position</td>
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<tr>
<td>15</td>
<td>Morning</td>
<td>NGOs, Private sector</td>
<td>Interview</td>
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<td></td>
<td>Afternoon</td>
<td>Traveling to Hawassa</td>
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<tr>
<td>16</td>
<td>Morning</td>
<td>Traveling to Hawassa</td>
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<tr>
<td>17</td>
<td></td>
<td>Travelling Hawassa to Addis Ababa</td>
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</tbody>
</table>
3.3. Evidence Describing the Program's Selected Impact Indicators

We have gathered substantial evidence pertaining to 13 impact indicators during interviews and focus group discussions involving members of rural households and representatives of NGOs and government departments. We worked in three rural areas in which a subset of households has access to irrigation water.

The Golbra Girisa Scheme in the Shalla District

This is a traditional, river diversion irrigation scheme (designed and constructed by farmers) involving either 32 or 38 households. The farmers have created a water user association on their own initiative. The government has conducted a feasibility study to examine the potential for expanding the scheme in cooperation with Oxfam. The size of the expanded scheme will depend in part on the cost.

The Burqitu Multiple Use Irrigation Scheme in the Duga Dawa District

The Burqitu scheme provides water for domestic and livestock use, in addition to irrigation water. There are 23 groups within a somewhat large Water User Association. There is a subcommittee for irrigation within the Water User Association. There are 515 households benefitting from either domestic or irrigation water. Only 104 or 105 households benefit from irrigation. There are six domestic water points and six shower units. There are four ponds and twelve livestock watering points.

The water source is spring water on mountain sides. The water is collected via gravity in large, concrete tanks and then delivered downhill from there. The old system had a 0.6 km main canal. With Oxfam’s intervention, the canal system has been extended to 12.5 km, including the secondary canals. There are conflicts along the canal, as farmers often do not wish to wait for their turn to resume irrigation. The length of time between turns might be as long as 28 days, which is much longer than on many other rotational irrigation schemes.

The total irrigated area is 50 ha, benefitting from 100 to 130 households. The cost of the project, funded by Oxfam, was 3.8 million Ethiopian Birr. Households are expected to pay 20 Birr per year for maintaining the canal system. Evidently, only 40 households had paid this fee at the time we conducted our study. There may only be 104 irrigating households at this time, according to public officials. Production is somewhat diverse in this area. The list of crops is quite varied, and it includes coffee, chat, bananas, papayas, and peppers.

We understand that, initially, women were involved in the design of the Burqitu irrigation scheme. This changed over time, perhaps due to misinformation or misperceptions regarding allowances provided to them by AFD.
The Abinne 2 Irrigation Scheme in the AJK District

The Abinne 2 scheme is powered by diesel pumps that divert water from a lake. A water user association manages the pumps and collects monthly fees from members. The system is gravity flow beyond the diversion point from the lake.

This Abinne 2 area is much closer to Addis than the other two schemes. There is a paved road available and, hence, the farmers have better access to input and output markets. Representatives of IDE have told us there are about 1,000 pumps around the lake. The size of lake has decreased by 3.5 km within the last 10 years. There are about 2,000 hectares under irrigation in the district, involving both small-scale and commercial development.

The evidence we have collected from participants at the three sites is summarized by impact indicator and irrigation scheme in Table 3.3.
### Table 3.3. Detailed Evidence Regarding the Assumptions and Research Questions Pertaining to Selected Impact Indicators

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Study Site 1. Golba Girisa, SSI, CDI, Shalla District, West Arsi Rift Valley</th>
<th>Study Site 2. Burqitu MUS, Duga Dawa District, AFD</th>
<th>Study Site 3. Abinne 2, SSI, SEDA, East Shewa Rift Valley, AJK District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assumptions and Questions</strong></td>
<td><strong>Public Officials</strong>&lt;br&gt;This is not yet a formal irrigation scheme. Residents constructed an earthen canal for delivering water from the Dhadhaaba River. They maintain the canal on their own. Those who have land near the canal have access to the water. In addition, only those households providing labor during canal construction are eligible to receive irrigation water. Households wishing to gain access later must pay 1,300 Birr as a minimum entry fee. This is too high a fee for most households.</td>
<td><strong>Public Officials</strong>&lt;br&gt;Residents are largely of the same ethnic group (Oromo), and thus there are no issues involving access and ethnicity. The maximum irrigated area is one hectare per household, but there are exceptions. All owners of livestock have access to the watering points, provided they reside within the Peasant Association.</td>
<td><strong>Public Officials</strong>&lt;br&gt;One ethnic group, the Silte, is dominant in the region. They have better access to irrigation than the Oromos, evidently. The Silte are skilled tradesmen, while the Oromos are more interested in raising livestock. Most households have very small plots of land, just 200 square meters. The primary tension in the region is between the Silte and the Oromo. The five private firms in the area have large pumps and have a potential impact on smaller scale users. The officials in the Water Resources Office are suggesting that they need to use drip irrigation to increase water use efficiency.</td>
</tr>
<tr>
<td><strong>Who benefits?</strong></td>
<td><strong>PA Leader and School Head</strong>&lt;br&gt;Households can rent irrigated parcels annually for a price of 500 Birr per 0.25 hectares. The price is negotiable and it can vary with family connections.</td>
<td><strong>NGO Representatives</strong>&lt;br&gt;AFD has attempted to persuade farmers to promote the recognition of women as legitimate owners of land, but this perspective is not yet widespread. AFD works also on improving domestic water supply to reduce the amount of time required for women and children to fetch water.</td>
<td><strong>Households</strong>&lt;br&gt;The Oromo consider the irrigation system to be biased toward the Silte. The Oromo claim that most of the benefits of irrigation development have gone to the Silte. The Silte consider that they showed a</td>
</tr>
<tr>
<td><strong>Who is systematically excluded?</strong></td>
<td><strong>NGO Representatives</strong>&lt;br&gt;Access to water is determined by the location of one’s land. Some residents have negotiated with neighbors to gain access to some irrigated parcels. CDI is working with traditional institutions (such as the local Gaddaa council) to promote gender equity and prevent harmful traditional practices, such as refusing land entitlement to women, arranged and forced marriages, and female genital mutilation.</td>
<td><strong>Households</strong>&lt;br&gt;There is no provision for recognizing more than one wife in the process of registering and obtaining a title to land. Hence, many women are not legally entitled to land ownership when a husband dies.</td>
<td><strong>NGO Representatives</strong>&lt;br&gt;SEDA has suggested that gender issues are not substantial in this area, but the accuracy of this suggestion is not clear.</td>
</tr>
</tbody>
</table>

**Notes:**
- **In intervention areas**
- Public Officials
- PA Leader and School Head
- NGO Representatives
- Households

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Equitable access to productive opportunities related to land and water (in intervention areas)

1. **Public Officials**
   - This is not yet a formal irrigation scheme. Residents constructed an earthen canal for delivering water from the Dhadhaaba River. They maintain the canal on their own. Those who have land near the canal have access to the water. In addition, only those households providing labor during canal construction are eligible to receive irrigation water. Households wishing to gain access later must pay 1,300 Birr as a minimum entry fee. This is too high a fee for most households.

2. **PA Leader and School Head**
   - Households can rent irrigated parcels annually for a price of 500 Birr per 0.25 hectares. The price is negotiable and it can vary with family connections.

3. **NGO Representatives**
   - Access to water is determined by the location of one’s land. Some residents have negotiated with neighbors to gain access to some irrigated parcels. CDI is working with traditional institutions (such as the local Gaddaa council) to promote gender equity and prevent harmful traditional practices, such as refusing land entitlement to women, arranged and forced marriages, and female genital mutilation.

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Public Officials

- Residents are largely of the same ethnic group (Oromo), and thus there are no issues involving access and ethnicity. The maximum irrigated area is one hectare per household, but there are exceptions. All owners of livestock have access to the watering points, provided they reside within the Peasant Association.

**NGO Representatives**

- AFD has attempted to persuade farmers to promote the recognition of women as legitimate owners of land, but this perspective is not yet widespread.

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Public Officials

- One ethnic group, the Silte, is dominant in the region. They have better access to irrigation than the Oromos, evidently. The Silte are skilled tradesmen, while the Oromos are more interested in raising livestock. Most households have very small plots of land, just 200 square meters. The primary tension in the region is between the Silte and the Oromo. The five private firms in the area have large pumps and have a potential impact on smaller scale users. The officials in the Water Resources Office are suggesting that they need to use drip irrigation to increase water use efficiency.

**NGO Representatives**

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Public Officials

- Residents are largely of the same ethnic group (Oromo), and thus there are no issues involving access and ethnicity. The maximum irrigated area is one hectare per household, but there are exceptions. All owners of livestock have access to the watering points, provided they reside within the Peasant Association.

**NGO Representatives**

- AFD has attempted to persuade farmers to promote the recognition of women as legitimate owners of land, but this perspective is not yet widespread.

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Public Officials

- Residents are largely of the same ethnic group (Oromo), and thus there are no issues involving access and ethnicity. The maximum irrigated area is one hectare per household, but there are exceptions. All owners of livestock have access to the watering points, provided they reside within the Peasant Association.

**NGO Representatives**

- AFD has attempted to persuade farmers to promote the recognition of women as legitimate owners of land, but this perspective is not yet widespread.
### Farm produce prices / nearest market prices / price discovery / storage

#### Assumptions and Questions

The farmers gain access to markets if they are well organized in independent business entities that have bargaining power on market prices and invest in transport, inputs and storage...

<table>
<thead>
<tr>
<th>Public Officials</th>
<th>Households</th>
<th>NGO Representatives (CDI)</th>
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</thead>
<tbody>
<tr>
<td>The nearest district town, Shashamene, is 40 km away. The road to Shashamene is quite poor and difficult to transit. An alternative market is a two-hour walk away (Arsi Negelle). Most residents use horse-drawn carts for transporting produce to the market.</td>
<td>Storage is not available. Hence, farmers lose notable portions of their produce. There are very few options for selling fresh produce. Largely they must sell their produce in spot markets at prevailing prices. There is little opportunity to search for desirable prices, given the lack of storage. The households are truly price takers, as they must accept market prices when the produce is ready to be harvested and sold.</td>
<td>Transport is a limiting constraint. Households need better transport options. The 40-km trip by cart to Shashamene can require a day or longer.</td>
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<tr>
<td>The nearest market is in Finchaa, which is 6 km to 8 km away by road. On market days, the farmers carry their produce to the market, using ox-drawn and donkey-drawn carts.</td>
<td>Storage is not available. Hence, farmers lose notable portions of their produce. Finchaa is a small town with limited demand for farm produce. To expand output successfully, farmers would need affordable access to the larger market in Bule-hola, which is about 50 km to 60 km away. The road to Bule-hola is paved after the first 8 km. Lacking adequate transport, farmers often sell their produce at low prices in Finchaa. Middlemen can purchase the produce cheaply in Finchaa and sell it for a higher price in Bule-hola.</td>
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<tr>
<td>The nearest market is in Zway, which is within two km. Farmers also send produce to Addis Ababa.</td>
<td>Middlemen take advantage of the farmers, even though they are close to the market. Farmers learn about prices primarily from the middlemen who come to purchase their produce. The farmers often are eager to sell, to raise cash and to move their perishable produce. Farmers have no storage facilities. There is a glut effect on prices, also, because many of the farmers produce the same crop and harvest it at the same time. The uniformity of production plans also creates conflicts over irrigation water, as many farmers require water at the same time.</td>
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**Households**

There is no systematic exclusion. Access is dependent on the location of land. Those with land located further from the main canal receive less reliable access than households with land located nearer to the canal. This is typical of the classical head-tail issue in surface irrigation systems. Seepage losses are partly responsible for diminished water deliveries at the tail ends of secondary canals.

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**Public Officials**

The nearest market is in Finchaa, which is 6 km to 8 km away by road. On market days, the farmers carry their produce to the market, using ox-drawn and donkey-drawn carts.

---

**Households**

Storage is not available. Hence, farmers lose notable portions of their produce. Finchaa is a small town with limited demand for farm produce. To expand output successfully, farmers would need affordable access to the larger market in Bule-hola, which is about 50 km to 60 km away. The road to Bule-hola is paved after the first 8 km. Lacking adequate transport, farmers often sell their produce at low prices in Finchaa. Middlemen can purchase the produce cheaply in Finchaa and sell it for a higher price in Bule-hola.

---

**Public Officials**

The nearest market is in Zway, which is within two km. Farmers also send produce to Addis Ababa.

---

**Households and NGOs**

Most of the irrigated production is vegetables including onions and tomatoes. Middlemen take advantage of the farmers, even though they are close to the market. Farmers learn about prices primarily from the middlemen who come to purchase their produce. The farmers often are eager to sell, to raise cash and to move their perishable produce. Farmers have no storage facilities. There is a glut effect on prices, also, because many of the farmers produce the same crop and harvest it at the same time. The uniformity of production plans also creates conflicts over irrigation water, as many farmers require water at the same time.
### Input price paid by WUA versus non-WUA farmers (in intervention areas)

#### Assumptions and Questions

The farmers gain access to markets if they are well organized in independent business entities that have bargaining power on market prices and invest in transport, inputs and storage...

<table>
<thead>
<tr>
<th>Public Officials</th>
<th>Ward Chairman</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is an informal WUA, but the association does not engage in marketing activities. The WUA largely allocates water to farmers and organizes labor for cleaning canals. The WUA has been operative for only 1 year. Most farmers in this very remote region do not purchase or apply commercial inputs.</td>
<td>The ward chairman reported some prices. The price of maize seed has increased from 198 to 340 Ethiopian Birr over an unspecified time period. Households have problems obtaining inputs such as fertilizer, pesticides, and herbicides, due partly to the lack of credit. In addition, the prices of inputs have been rising in recent years.</td>
<td>The WUA does not provide assistance with the purchasing of inputs or the marketing of outputs. Lack of credit and high input prices cause farmers to use limited amounts of purchased inputs. The amounts of credit available have been declining, in part because lenders have not received full repayment in the past.</td>
</tr>
<tr>
<td><strong>Public Officials</strong></td>
<td><strong>Households</strong></td>
<td><strong>Public Officials</strong></td>
</tr>
<tr>
<td>The Water User Association is involved primarily in water allocation and distribution. It is not involved in purchasing inputs or marketing outputs.</td>
<td>There are no differences in prices paid by members and non-members of WUAs. There is a water committee charged with responsibility for all water issues, including domestic water supply. Within this, there is a sub-committee charged with irrigation. Neither the full committee nor the sub-committee provides any preferential input prices.</td>
<td>The Water User Association is involved primarily in water allocation and distribution, and in maintaining the pumps at the lake. It is not involved in purchasing inputs or marketing outputs.</td>
</tr>
</tbody>
</table>
| **Households** | **Hous...| There are no differences in prices for members and non-members of WUAs.
4. Current NGO investments directly in "water for productive use" (hard ware & soft ware) 
(at communal, regional and federal levels)

**Assumptions and Questions**
Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?

<table>
<thead>
<tr>
<th><strong>NGO Representatives, Households, and Public Officials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>To date, there are no government or NGO investments in this area. However, households have constructed an irrigation canal and formed a WUA to oversee canal maintenance and manage water deliveries.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Public Officials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Pastoralist Development Office at the Woreda level plans to strengthen the capacity of pastoralists in the region. They plan to support private pond development in groups of 5 to 7 households. The Office also is working on irrigation development, in conjunction with other Woreda level offices. In addition, the Office is helping to improve livestock market opportunities in the region.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NGO Representatives</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Action for Development (AFD) is active in the area. They are investing in water for productive and domestic uses. Their productive water program primarily involves improving the availability of water for livestock. AFD and CARE plan to form a consortium of NGOs working on water. This is related to the Global Water Initiative, which is funded initially by Warren Buffet. Much of the focus will be on domestic water use and water for livestock. JICA and the European Union also are involved in projects to enhance domestic water use and water for livestock. This effort pertains to the larger region, and not specifically to the study area.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Public Officials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Woreda does not have a plan for investing in water for productivity. However, the federal and regional governments are planning to expand the size of irrigated area.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NGO Representatives</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>SEDA, IDE, and the Rift Valley Children and Women Development Association are investing in irrigation and domestic water use in the region. We are not aware of the proportions of budgets made available for investments in water productivity. The Rift Valley Children and Women Development Association has an annual budget of 10 million EB, of which 70% is for irrigation development, including both physical infrastructure and institutional enhancements.</td>
</tr>
</tbody>
</table>
5. Current woreda budgets from the region for “water for production” (in intervention areas)

**Assumptions and Questions**

Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?

<table>
<thead>
<tr>
<th>Public Officials</th>
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<th>Public Officials</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no budget “for water for production.”</td>
<td>There is no budget “for water for production.”</td>
<td>There is no budget “for water for production.”</td>
</tr>
<tr>
<td>Woredas obtain their budgets from regional governments. The Woredas generally do not have authority or flexibility to make large adjustments in the budgets. In many cases, personnel costs account for 85% to 95% of Woreda budgets.</td>
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</tr>
<tr>
<td>Revenues generated locally by Woredas must be delivered to the regional government. Hence, there is limited incentive for a Woreda to raise revenue from farmers and other residents.</td>
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<td>Revenues generated locally by Woredas must be delivered to the regional government. Hence, there is limited incentive for a Woreda to raise revenue from farmers and other residents.</td>
</tr>
</tbody>
</table>
## Donor funding commitments, federal government policy, and investment plans for small-scale irrigation and water for pasture (at federal level)

### Assumptions and Questions

Co-investment by NGOs, government and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship. How can the co-investment be sustainably institutionalized over time, and how does the tax base issue come into play?

### Plans for investing in water for production are not evident. Most officials and donors are more interested in providing domestic water supply at this time.

At the district level, the federal government is making motor pumps available to households. The pumps can be used to withdraw water directly from a river. In our study area, irrigation water is distributed to parcels via gravity flow from the community’s river diversion point. We did not observe any pumps at the diversion point for our study area. Water is diverted from the river via gravity.

### The government has large investment plans for the District. The Pastoral Development Office at the zonal level has already begun constructing projects for domestic water and livestock use. This is part of the new Fentale Scheme. The government is eager to obtain co-funding to support their investment plans in this area. To date, NGOs operating in the region have not expressed much interest.

### The government intends to invest in water for livestock as part of a program to encourage the settlement of pastoralists. The plan at the zonal level is to develop 100 ha of land around Abinne, by providing a motor pump and constructing primary and secondary canals. The plan is to serve 200 households, thus allowing them each to irrigate about 0.5 hectares. The plan includes three motor pumps, of which two will likely be sufficient, and one will be a backup. The pumps will be electric, rather than diesel. The planned budget is 3.45 million Ethiopian Birr.

The government has recently built a dam on the Bulbula River at a cost of 30 million Ethiopian Birr, to support irrigation development. This is partly an attempt to displace some of the demand pressure on the lake. The dam will be used also to regulate flow into the lake.
7. **Woreda capacity**
   to support communities in developing and managing their water resources **(in intervention areas)**

**Assumptions and Questions**
Woreda officials will be motivated to play a strong supportive role if they receive sufficient budget and incentives from the regional government

<table>
<thead>
<tr>
<th>Public Officials</th>
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<th>Public Officials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Woreda Water Resource Office needs 28 professionals, but they have only 7 at this time. Of the 7, there are 6 diploma holders (3 electro-mechanical engineers, 1 specialist in rural water supply and sanitation, 1 specialist in small-scale irrigation and drainage, and 1 specialist in water technology) and one secretary. The office lacks a functioning vehicle for transporting staff members to the field. They currently use horses and donkeys. They have only one computer, and no internet access.</strong></td>
<td><strong>The Zonal level Water Resources Department has 2 water and irrigation engineers, 1 soil and water construction engineer, 1 surveyor, 1 meteorologist, and 1 socio-economic expert. None of these is a woman. The office works primarily on domestic water issues. The district also lacks access to a GPS system and they do not have a budget for capital investments. About 93% of the Woreda budget is allocated to staff salaries. The office needs additional computers, office equipment, and furniture.</strong></td>
<td><strong>An estimated 95% of the budget of the District is allocated to personnel. At the zonal level, there are 18 professional staff members in the Water Resources Office. Three of these are women, but their roles are not clear. There is a general shortage of staff members.</strong></td>
</tr>
</tbody>
</table>

In all of the study areas, there is high staff turnover in the Woreda departments. Reasons include the lack of desire to work in remote areas. Facilities are often substandard. The Business Process Re-engineering program underway in Ethiopia also is responsible for some of the high turnover. Many staff persons are moved from one position to another after a short period. The high turnover rate limits current capacity and the rate of capacity development in Woreda departments.
<table>
<thead>
<tr>
<th><strong>8. Productive water needs &amp; interests(^2) met (by social group)</strong>&lt;br&gt; <em>(in intervention areas)</em></th>
<th><strong>Households</strong></th>
<th><strong>Households</strong></th>
<th><strong>Households and NGOs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This study area is in a small watershed with little variation in social groups. Most residents are of the same ethnic group. It is likely that all households would desire additional water for production, but the lack of water is not related to social status, although the location of land is a determining factor.</td>
<td>Livestock and domestic water needs are largely met in this area. There remain notable unmet demands for irrigation water. An NGO had suggested that households would receive training on marketing and canal maintenance, but the training has not yet been provided.</td>
<td>Most households would prefer to have more water. The current pumping capacity is not sufficient to meet all water demands. However, it is not clear that a higher rate of annual pumping could be sustained for long given the limited rate of inflow into the lake. The Silte seem to be in a better position than the Oromos. When irrigation began in the region, the Silte joined quickly. The Oromos were reluctant at first. They have become more desirous of irrigation in recent years, given that pastoralism is under pressure. Today the Silte do most of the irrigating in the area, while the Oromos largely raise livestock and produce rainfed crops. Farmers need training on the proper use and basic maintenance of pumps.</td>
</tr>
</tbody>
</table>

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\(^2\) Measurement of this indicator will look at a whole range of aspects such as whether the water system design was reflective of women’s and other disadvantaged groups’ needs and approved in the WUA before construction begins.
<table>
<thead>
<tr>
<th>9.</th>
<th>Proportion of women in leadership positions in community institutions and their influence on community priorities/decisions (in intervention areas)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Officials</strong></td>
<td>There are no women in leadership positions in the intervention area. We understand that there might be one woman on the Ward Council (kebele), which is a higher-level entity that includes the intervention area and other villages. There are no women in leadership positions in the local Water User Association.</td>
</tr>
<tr>
<td><strong>Households</strong></td>
<td>A woman who serves as a member of the Social Court is often excluded from discussions and decisions, as male members of the Court do not inform her of selected meetings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.</th>
<th>Proportion of women in leadership positions and their influence on priorities/decisions in NGOs working on small-scale water resource development for smallholders (in intervention areas)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NGO Representatives</strong></td>
<td>We spoke with representatives of three NGOs working in the district (CDI, the Kalehiwot Church, and the Kembata Women's Self-Help Center, Ethiopia). None of the NGOs employs women in leadership positions at this time. Women are employed as junior-level field staff and in secretarial and other support positions. Of the 18 field staff members working for CDI, 6 are women serve in junior-level positions. The gender officer in CDI is male.</td>
</tr>
<tr>
<td><strong>NGO Representatives</strong></td>
<td>A woman serves as the gender officer in AFD, which has implemented programs designed to help women learn more about marketing strategies. The gender officer for AFD has told us that she has very little influence regarding AFD’s priorities and decisions.</td>
</tr>
<tr>
<td><strong>NGO Representatives</strong></td>
<td>Fewer than 10% of the SEDA professional staff members working in the region are women.</td>
</tr>
</tbody>
</table>
## 11. Proportion of women in leadership positions and their influence on priorities/decisions in Government Offices responsible for small-scale water resource development for smallholders (at local and regional levels—in intervention areas)

### Public Officials
- Of the 7 professional staff members in the Woreda Water Resource Office, the only woman is serving as the secretary.
- In all areas, the government tends to set quotas for women in all institutions. Women should account for a minimum of 30% of staff membership. Women are encouraged to move into leadership positions. However, in many of our discussions, it became clear that the number of women serving in leadership positions is quite small.

### Public Officials
- Of the six professional staff members in the Water and Irrigation Department, none is a woman.
- There are three women in the Woreda Cabinet, but this is likely less than 1% of the membership. Two women serve as Team Leaders in Bureaus, while two women serve as school directors, and 15 serve as speakers at the Peasant Association level. There may be as many as 300 persons in the Peasant Association.

### Public Officials
- The district employs 454 persons in all sectors. There are 353 males and 101 females. In addition, there are 555 teachers, of whom 395 are male and 160 are female. Of the teachers, 44 have degrees, of which 36 are male and 8 are female.

- The district-level Women and Children Affairs Office is promoting the development of savings and credit associations, operated by women. The Office works also on legal issues pertaining to improvements in the status and livelihoods of women.
12. Water productivity (in intervention areas)

**Households**
Crop yields obtained with irrigation generally are higher than yields without irrigation. Household examples of rainfed and irrigated yields in 2009 include the following.

**Household 1**
Rainfed maize, 2 ha, total loss  
Rainfed wheat, 2.125 ha, total loss  
Irrigated potatoes, 0.125 ha, 13 sacks

**Household 2**
Renting 0.25 ha for 600 Birr  
Yields: 
Irrigated cabbage 80 sacks on 0.25 ha (Sold for 1,000 Birr)  
Rainfed maize, 15 sacks on 2 ha (Sold 4 sacks, 1,200 Birr)

**Household 3**
All rainfed:  
Maize, 0.5 ha, 2 sacks  
Wheat, 0.5 ha, total loss

**Household 4**
Female-headed household with 11 members. Has 0.5 hectares of rainfed land; no irrigation. Produces two crops each year: maize and soybeans. She has not harvested the maize.

**Household 1**
One wife, 4 members  
Examples: 1 ha irrigated, 1 ha rainfed. He obtained 2 ha during the redistribution of land. He has purchased additional 3 ha, also. Harvest per unit now is 8 to 10 sacks of maize.  
Rainfed maize  
Irrigated soybeans

**Household 2**
There are 10 males, 13 females; married with 2 wives. Only 1 ha under irrigation and 4 ha rainfed land. Also has 2 ha grazing land. Harvest data:  
Maize no harvest this year, 300 Birr from irrigated chat.  
Exchange rate is about 13 Birr per USD.

**Household 3**
There are seven members in the household. There are 3 ha, but no irrigated plots. He has obtained 5 sacks of maize from 1.5 rainfed ha. Rainfed soybeans: 4 sacks from one hectare. He obtained 2 sacks of Tef from 0.5 hectares. He is not a member of the WUA.

**Household 4**
Female-headed household with 11 members. Has 0.5 hectares of rainfed land; no irrigation. Produces two crops each year: maize and soybeans. She has not harvested the maize.

**Households**
Many households report improvements in livelihoods, but they lack access to key inputs, such as seeds and fertilizer. Yields are higher with irrigation, but input prices are high and there is a persistent threat of drought. Some folks complained also that grain prices have been increasing, while the prices of vegetables have not been sufficiently high. Given that households must purchase grains in the market, they are concerned about the prospect of not generating enough revenue to purchase food supplies.

**Household 1**
Land size of 1 hectare  
Rainfed maize, 15 sacks, 0.75 ha  
Onions, 50 sacks, 0.125 ha  
Tomatoes, 20 sacks, 0.125 ha  
Peppers, 10 sacks, 0.125 ha  
Cabbage, no data, 0.125 ha

**Household 2**
Widowed female head of household  
Land size of 1 hectare  
Rainfed maize, 3 sacks, 0.125 ha  
Rainfed sorghum, 1 sack, 0.125 ha  
Irrigated crops:  
Onion, 50 sacks, 0.125 ha  
Tomatoes, 40 boxes, 0.125 ha  
Cabbage, papaya, avocado, and inset (false banana)  
Sells onions at 1.5 EB / kg.
<table>
<thead>
<tr>
<th>13. Household food security level (in intervention areas)</th>
<th>Household 1, from above</th>
<th>Household 2, from above</th>
<th>Household 3, from above</th>
<th>Household 4, from above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: We do not yet know the size of sacks reported for crop yields by some households.</td>
<td>Food supply has been short since 2008. The household consumes only one meal per day, on average. The meals generally are maize based. They have not yet received any food assistance. Their access to irrigation might cause them to be disqualified by food security programs. The head of household has 3 wives. There are 15 females and 5 males in the household. He owns 20 cattle, 4 donkeys, and 6 goats.</td>
<td>Head of household has only 1 wife. There are 9 members of the household. There are 2 cows, 1 donkey, and 13 chickens. The household is food secure for only 5 months each year. They were on the Public Safety Net Program (PSNP) for six months last year. Normally the household consumes two meals per day.</td>
<td>This household does not have irrigation and they do not own livestock. There are only 3 persons in the household, including just one child. The household has had a serious food security problem since 2009. They generally eat twice per day. The household receives no government assistance, even though they need it, according to the household head. He would like to join the irrigation scheme, but he cannot afford the 1,500 birr fee for joining.</td>
<td>This year, they consumed no months from their own stock. They eat 2 meals per day, but they cannot eat from their own food stocks. This seems infeasible. Primary foods are maize, bread, and false banana. They received PSNP aid for only one month in which they received just one 50 kg bag of grain.</td>
</tr>
<tr>
<td>Public Officials</td>
<td>We understand that 401 of 1022 (36%) households rely on the government sponsored food security scheme. These data pertain to the Peasant Association, which is a larger group than those who have access to irrigation.</td>
<td>They consume 6 months from their own stock. They eat 3 meals per day. They do not receive support from the government or other donors.</td>
<td>Consume for 2 months from own stock. They eat 2 meals per day. They consume primarily maize, and they receive PSNP food support for 6 months, and no other support.</td>
<td>This year, they consumed no months from their own stock. They eat 2 meals per day, but they cannot eat from their own food stocks. This seems infeasible. Primary foods are maize, bread, and false banana. They received PSNP aid for only one month in which they received just one 50 kg bag of grain.</td>
</tr>
<tr>
<td>Household 1, from above</td>
<td>They consume 6 months from their own stock. They eat 3 meals per day. They do not receive support from the government or other donors.</td>
<td>They consume no months from their own stock, particularly during drought years. They eat only once or twice per day. They primarily eat maize and false banana. They receive food supplements for 3 months.</td>
<td><strong>Household 1, from above</strong> Family size is 8 members. Head is married with one wife. They consume for 12 months from their own stock. They eat three meals per day.</td>
<td><strong>Household 2, from above</strong> Family size is 8 members. On average, they consume 3 months from their own stock, and they eat only once or twice per day. His application for food assistance was rejected, perhaps because he is a member of a Water User Association.</td>
</tr>
</tbody>
</table>
3.4. Evidence-based Findings on the Program's Theory of Change

Given the information we have gathered from members of rural households and representatives of NGOs and government agencies pertaining to irrigation investments in moisture-stressed, rural areas of Ethiopia, we recommend enhancing the Theory of Change in four ways:

1. Distinguishing more clearly between the desired outcomes and impacts that changes in perceptions, behavior, and policies will generate, over time

2. Rearranging several elements in the Theory of Change to depict more clearly the time dimensions of co-investments and other activities,

3. Adding several elements that reflect near-term needs and opportunities in moisture-stressed, rural areas of Ethiopia, and

4. Inserting intermediate and long-term outcomes and impacts that can be used in evaluating program effectiveness.

We present our proposed enhancements in Table 3.4, which depicts three sets of co-investments and activities, along with pertinent outcomes and impacts. The first set includes near-term co-investments intended to generate desirable outcomes and impacts by 2015. Several of the co-investments are not shown explicitly in the original Theory of Change, yet we think they deserve recognition. We recommend moving forward with co-investments in water scheme development, coincident with making similar investments to provide affordable access to complementary inputs and to improve household access to storage facilities and viable markets. Such investments must be made in concert to ensure that investments in water development are effective in achieving desirable outcomes.

It is also essential to ensure that sufficient water resources are available to support irrigation development in project areas. This will require a combination of hydrologic, agronomic, and policy analysis to determine the amount of water available, the likely farm-level demands for water, and the potential changes in government policies that might modify water supply or demand conditions without consideration of project activities.

The hydrographs of water availability in moisture-stressed regions likely depict substantial variation, as surface water volumes depend on seasonal rainfall. The stochastic nature of surface water supplies must be considered carefully when designing irrigation interventions in arid areas where the sum of farm-level demands for water will exceed the available supply in most years. Establishing legal systems of water rights is a desirable outcome, but water rights cannot guarantee the availability of sufficient water for irrigation in a moisture-stressed region with highly variable rainfall patterns. Even the best system of water rights and the most effective water user associations cannot completely eliminate farm-level risk and uncertainty in such regions. Policy makers and
project designers must investigate and explain these issues clearly when evaluating investment alternatives.

In our proposed list of outcomes to be achieved by 2015, we include three items from the original Theory of Change, and we add two new outcomes. We think it is necessary to achieve notable improvements in crop yields and livestock productivity within the near future, to motivate households and communities to continue supporting the co-investment model. Such outcomes are needed also to generate near-term gains in household health and welfare, and to begin improving food security in sustainable ways. This requires that we also make progress in reducing farm-level risk and uncertainty, while increasing household resilience to setbacks in crop yields and farm incomes. Achieving these outcomes by 2015 will demonstrate the near-term success of the co-investment program and establish the conditions for moving completely through the Theory of Change by 2020.

If we are successful in achieving the 2015 outcomes, we should also observe measurable impacts on household food security, health and welfare, the ability to accommodate risk and uncertainty, and resilience to setbacks. It is important to develop impact indicators that will enable us to evaluate the progress achieved in these areas, both in 2015 and 2020.

The second set of co-investment activities in Table 3.4 includes the four components that comprise the "Local Capacity, Organization, and Co-Investment" activities in the original Theory of Change. While proposing to leave these core activities largely intact, we specify set of desirable outcomes and impacts to be achieved by 2020. The seven outcomes appear in the original theory of change. We have simply listed them as outcomes in the proposed enhancement. The three impacts to be observed by 2020 are extensions of those we included with the first set of activities. We should expect to see further improvements in household food security, health and welfare, and resilience as the Theory of Change unfolds to 2020.

The third set of activities in Table 3.4 is based upon the "Regulatory and Institutional Framework" and the "National Policy, Legislation, and Resource Leverage" modules in the original Theory of Change. We have condensed four activities into three, and we have added a list of desirable outcomes pertaining to those activities. The outcomes resemble information that appears either explicitly or implicitly in the original Theory of Change. We think it is helpful to array the information in the form of desirable outcomes. The third set of activities does not include a separate set of impacts, as the activities are intended to contribute to achieving the same 2020 impacts included with the second set of activities.

We consider that the co-investments and other activities described in all three sets will be initiated in 2011. While we provide lists of outcomes and impacts for 2015 for the near-term co-investments only, it will be helpful also to design intermediate measures for assessing progress toward achieving the 2020 outcomes and impacts described in the second and third sets of activities.
We look forward to discussing the proposed enhancement in the Theory of Change and to considering innovative methods for measuring progress toward achieving outcomes and impacts as the co-investments are implemented and the institutional activities are pursued from 2011 through 2020.

3.5. References


Wichelns, D., Oster, J.D., 2006. Sustainable irrigation is necessary and achievable, but direct costs and environmental impacts can be substantial. *Agricultural Water Management* 64(1): 17-27.
**Table 3.4. Proposed Refinements in Strategy, Pertaining to the Theory of Change**

<table>
<thead>
<tr>
<th>Near-term Co-Investments, Outcomes, and Impacts</th>
<th>Longer-term Co-Investments, Outcomes, and Impacts</th>
<th>Institutional Co-Investments and Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Co-investment Program 2011 to 2015</strong></td>
<td><strong>Co-investments and Activities, 2011 to 2020</strong></td>
<td><strong>Co-investment Program 2011 to 2026</strong></td>
</tr>
<tr>
<td>Outcomes by 2015</td>
<td>Outcomes by 2020</td>
<td>Outcomes by 2020</td>
</tr>
<tr>
<td>Impacts by 2015</td>
<td>Impacts by 2020</td>
<td>Impacts by 2020</td>
</tr>
<tr>
<td>Co-invest in water scheme development with appropriate partners</td>
<td>Working with regional NGOs and CSOs, establish and mentor community and government relations through co-investment and co-decision-making in water scheme development (Tripartite Agreements)</td>
<td>Promote the regulatory and institutional framework required to ensure equitable access and distribution of water rights</td>
</tr>
<tr>
<td>Co-invest in efforts to enhance household access to complementary inputs</td>
<td>Co-invest in efforts to enhance household access to complementary inputs</td>
<td>National government policies that create incentives for investments in smallholder access to water for productive uses</td>
</tr>
<tr>
<td>Co-invest in efforts to improve household access to markets and storage</td>
<td>Co-invest in efforts to improve household access to markets and storage</td>
<td>Promote greater knowledge of best practices and understanding of bottlenecks in national policy and legislation</td>
</tr>
<tr>
<td>Examine the potential sustainability of investments in water schemes</td>
<td>Examine the potential sustainability of investments in water systems</td>
<td>Consitutional support for water policies that ensure smallholder access to water for productive uses</td>
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<tr>
<td>Assist communities in developing effective water user associations</td>
<td>Assist communities in developing effective water user associations</td>
<td>Increased budget and operational support from regional governments (investment targets by region)</td>
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<tr>
<td>Increase regional knowledge and conduct multi-stakeholder dialogues on equal access and fair distribution of water rights</td>
<td>Increase regional knowledge and conduct multi-stakeholder dialogues on equal access and fair distribution of water rights</td>
<td>Higher levels of funding for research and replication of co-investment</td>
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</table>

- Increased equitable access to water for production
- Improved household food security
- Effective local governance of water interests and needs, and improved conflict resolution
- Improvements in household health and welfare
- Promote greater knowledge of water rights and policies, and increase the capacity of rural communities to co-invest in the design, construction, operation, and maintenance of sustainable water schemes
- Positive engagement with the private sector for inputs and services
- Increase the capacity of local governments to co-invest in the design and construction of sustainable water schemes, and to support smallholder legal organizations
- Increased legal protection against unfair competition and rights denial
- Rural communities taking greater charge of decisions regarding water rights and resources
- Increased realization of women’s water interests, in relation to those of men
- Increased smallholder entrepreneurship based on greater confidence, influence, and resilience
- Innovative farming and livestock breeding practices, resulting in greater productivity and maintenance of natural resources
- National government policies that create incentives for investments in smallholder access to water for productive uses
- Constitutional support for water policies that ensure smallholder access to water for productive uses
- Increased budget and operational support from regional governments (investment targets by region)
- Higher levels of funding for research and replication of co-investment
- Equitable distribution of water rights and ensured access to water for productive uses
Annex A.
Research assumptions, questions, and methods pertaining to each of the thirteen indicators

1. Equitable access to productive opportunities related to land and water (in intervention areas)

Assumptions and Questions

Who is benefiting from investments in water resources for irrigation and livestock (position, power gender, ethnicity, pastoralist/agro-pastoralists, marital status/type age, economic status, social status, educational levels of household head, religion, social networks (associations), land ownership, land tenure arrangements)?
Are there formal and informal rules affecting access to water?
Who is systematically excluded?
Who is loosing or negatively affected (health, loss of land, displacement or relocation)(power dynamics between various social & ethnical groups)?
How do people create access to water and land?
What is the level of awareness regarding water rights (legal entitlements)?
Are there constraints to accessing water and land?

Methods

We will select villages near the irrigation scheme – in the upper, middle and downstream selections, to be determined in the field. We will conduct transect walks in each Kebele with selected informants, and collect data describing land, water and resource mapping. Conduct focus groups; social stratification and access mapping. Select household panels and conduct key informant interviews. Consider how access varies among social groups, working with local governments and NGO staff members.

2. Farm produce prices / nearest market prices (markets, linkage, storage facilities)(in intervention areas)

Farmers gain access to markets if they are well organized in independent business entities, with bargaining power regarding market prices, and they invest in transport, inputs and storage.

Are there WUA/Cooperatives linked to unions and buyers?
Do you have access to farm and pastoral inputs (fertilizer, pesticides, insecticides, labour, land, water, veterinary medicines, livestock vaccination services etc)?
Have you observed any changes in input prices since gaining the ability to irrigate?
If so, please describe those changes very clearly.
Of the changes you have observed, are there any you think were related to the availability of irrigation in your area? If so, please describe your perspective very clearly.

Since gaining the ability to irrigate, has your ability to obtain key inputs in a timely manner changed in any notable ways? Please be specific.

Since gaining the ability to irrigate, how have your input decisions changed? Please describe specific changes, such as using larger or smaller amounts of selected inputs, or purchasing some inputs that you could not afford previously.

Since gaining the ability to irrigate, have you noticed any changes in the productivity of inputs other than water, such as seeds, fertilizer, labor, or farm chemicals? If so, please describe the changes in productivity very clearly.

Do you have access to credit? Can you obtain a loan? If so, from who, on what conditions, and at what interest rate?

What happens if you cannot repay the loan? Have you ever taken a loan? Why or why not?

What difference can your water user association or cooperative make for you in obtaining loans?

Can your WUA/Coop today provide you with a loan?

What would be the conditions, interest rates, and terms of the loan?

Do you save with other farmers or households as a group?

How do you access credit (as an individual, or through your WUA/Coop)?

Which approach do you prefer, and why?

**Methods**

We will collect secondary data on market prices, and we will examine cooperative/union reports. We will also conduct focus groups and conduct semi-structured interviews with members of panel households.

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3. **Input price paid by WUA versus non-WUA farmers (markets, linkage) (in intervention areas)**

We wish to learn if members of water user associations have better access to markets or receive better prices on inputs and outputs. We will ask pertinent questions of household members and focus group participants.
4. Current community and NGO investments directly in “water for productive use” (hard ware & soft ware) (at communal, regional and federal levels)

We think that co-investment by NGOs, governments, and communities will lead to a renewed relationship that forms the basis for a new social contract fostering smallholder entrepreneurship.

How many NGOs are working in the case study Woredas, focusing on water for domestic or productive use?
What proportions of their budgets are invested in water for production?
What investments have communities made in water and pasture development (in any form: labor, materials, cash, produce) at both individual and community levels?
What are the returns of these investments in terms of higher productivity?
Which donor partners are supporting the NGOs working in the Woredas on water for production?
Which technologies have been introduced by the different NGOs?
What training and capacity building activities have been conducted by the NGOs?
What portions of the investments go to community organizations and capacity building involving water systems?
How, and to what extent, is capacity building linked to activities related to market access?
How do the NGOs engage with local and regional governments, and communities in proposing and planning projects, and designing water schemes and their organization?
Is there a network or forum for NGOs, government departments, and the community at large to meet and discuss issues and opportunities?
What are the opportunities and challenges for NGOs investing in water?
What are some of the sustainable strategies for co-investment?

Methods

We will obtain a list of NGOs and CBOs in respective Woredas, and we will interview key informants among NGO staff members. We will examine secondary data, conduct focus groups, and conduct interviews with local, regional, and federal government officials.

5. Current Woreda budgets from the region for “water for production” (in intervention areas)

What is the total Woreda budget?
How much tax is obtained by Woredas directly or indirectly from productive water use?
Do Woredas have discretion on the allocation and use of financial resources?
Are water tax funds being re-invested in water for productive use?
What proportion of the budget is invested in water for production?
What are the annual Woreda budgets and what are their strategic plans for investing in water for productive use?
How do Woredas intend to finance their investment plans?
What are the opportunities and constraints pertaining to Woreda investments in water for production?
Are Woredas utilizing the budgets that have been allocated for investing in water for production?
Are Woredas co-investing with partners in the water sector (domestic, productive)?
Have the Woredas identified and adopted any sustainable strategies for maintaining such co-investments?

**Methods**

We will interview key informants in Woreda finance and economic departments, in addition to Woreda administrators.

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6. **Donor financial commitments and federal government policy and investment plans for small-scale irrigation and water for pasture (at federal level)**

(List of NGOs at Federal level)

What is the current donor financial commitment for investments in water for productive use (how much support and how many projects)?
What are the current investment plans of federal and regional governments, regarding small-scale irrigation and pasture development?
What are the current policies and strategies for irrigation and water for pasture development at regional and federal levels?
What are the challenges and opportunities regarding potential policies and strategies?
What are potential strategies for implementing a sustainable co-investment approach?
How can co-investment be institutionalized over time in a sustainable fashion?
How is the limited tax base affecting co-investment opportunities?

**Methods**

We will examine secondary data describing the work and financial commitments of regional donors and Government departments.
7. **Woreda capacity to support communities in developing and managing their water resources (in intervention areas)**

Woreda officials will be motivated to play strong, supportive roles if they receive sufficient budget and incentives from the regional government.

How many professional experts dealing with water resources and irrigation do Woredas have?
Do Woredas have adequate facilities and technologies (motor bikes, vehicles, spray machines, telephones, computers)?
Are Woreda budgets sufficient to cover annual operating costs?
Are Woreda offices capable providing key support to communities in developing and managing their water resources?
In what ways do Woredas provide such support to communities?
What coordination mechanisms are used to support community efforts pertaining to irrigation?

**Methods**

We will interview key informants in Woreda line offices (cooperatives, agriculture and rural development, water). We will conduct semi-structured interviews with panel households, conduct focus groups w/ specific social groups (WUA members and non-members), and interview key informants including village leaders, NGO staff members, and Woreda officials.

8. **Productive water needs & interests met (by social group) (in intervention areas)**

How are social groups consulted and involved in the planning and design of irrigation and pastoral water development projects (men, women, youth, the elderly, ethnic groups, those with disabilities, despised groups, religious groups, political affiliations, the landless)?
What mechanisms are used to address the needs and interests of different social groups?
To what extent do social groups benefit from investments in water for production?
Have any conflicts resulted from water resource allocation among individuals, communities, or groups? If so, how has conflict been managed?

**Methods**

We will interview key informants, conduct focus groups members of selected social groups, and conduct semi-structured interviews with members of panel households.
9. **Proportion of women in leadership positions in community institutions and their influence on community priorities and decisions (in intervention areas)**

What is the proportion of women in leadership positions in the mapped institutions? [List all members, by committee.]
Who are these women, and to what groups do they belong?
What are their religious and ethnic backgrounds, their heritage, and the history of their families and clans?
What opportunities have enabled women to assume these positions?
Have women in leadership positions been able to influence community priorities and decisions?
To what extent have women been successful in using their influence to defend the interests of specific women groups (which groups?) and individuals (which individuals?) related to productive water issues?
If women have not been successful in gaining influence, what challenges have prevented their success in that area?

Are there any programs to enable women in leadership positions to share experience gained in other locations?
Additional considerations:

1. PARTICIPATION (% OF PRESENCE & INFLUENCE),
2. RESOURCE CONTROL (of cash, water, land, inputs, information/knowledge, technology),
3. BENEFIT-USE (of produce & income, choice of investments),
4. LABOR DIVISION (technical skilled, political influential versus non-skilled, non-political…)
5. AUTHORITY TO MAKE AND BREAK THE RULES (use specific case in which authority comes into play)
6. LEGITIMACY IN CLAIMING TRUTH & JUSTICE (use specific examples in which legitimacy comes into play)

**Methods**

We will conduct institutional mapping, with the help of focus groups. We will interview key informants among community leaders, conduct focus groups with members of selected social groups (gender differentiated), and conduct interviews with NGO staff members, Woreda gender officers, and members of cooperative commissions.

[Methodological notes: We should consider developing a special tool for assessing women in leadership positions at all levels. Such a tool can be helpful in identifying the relative predominance of males, mixed groups, and females at the farm level, in collectives (WUAs and cooperatives), and in formal and informal institutions. We should consider predominance on a continuous scale between the extremes of 100% male and 100% female. We can use such a tool in focus group discussions, as]
participants describe the implications of the predominance they identify for each of the six variables. This information should be checked against the data obtained during household panel interviews, using the same tool. In a sense, this is a straightforward, within-focus-group-discussion triangulation technique. In the household interviews and focus group discussions, we must be extremely sensitive to gender power dynamics. We must ask questions in a neutral, purely data-gathering manner. We must be certain to not provoke gender power dynamics, which could harm particular women or men after we are gone. Hence, we must be well informed about what can be asked and what cannot be asked during focus groups and household interviews.]

10. Proportion of women in leadership positions and their influence on priorities and decisions in NGOs working on small-scale water resource development for smallholders (in intervention areas)

What is the proportion of women in leadership positions in the NGOs working on small-scale water resource development in the intervention area?
Who are these women, and to what groups do they belong?
What are their religious and ethnic backgrounds, their heritage, and the history of their families and clans?
What opportunities have enabled women to assume these positions?
Have women in leadership positions been able to influence NGO priorities and decisions?
Do women in these positions have sufficient resources for this?
To what extent have women been successful in using their influence to defend the interests of specific women groups (which groups?) and individuals (which individuals?) related to productive water issues?
If women have not been successful in gaining influence, what challenges have prevented their success in that area?
Are there any programs to enable women in leadership positions to share experience gained in other locations?

Methods

We will conduct interviews with NGO staff members and we will review NGO organizational charts.
11. Proportion of women in leadership positions and their influence on priorities and decisions in Government Offices responsible for small-scale water resource development for smallholders (at local and regional levels –in intervention areas)

What is the proportion of women in leadership positions in local (Kebele/Woreda) and regional governments, working on small-scale water resource development in the intervention area?
Who are these women, and to what groups do they belong?
What are their religious and ethnic backgrounds, their heritage, and the history of their families and clans?
What opportunities have enabled women to assume these positions?
Have women in leadership positions been able to influence local and regional government priorities and decisions?
Do women in these positions have sufficient resources for this?
To what extent have women been successful in using their influence to defend the interests of specific women groups (which groups?) and individuals (which individuals?) related to productive water issues?
If women have not been successful in gaining influence, what challenges have prevented their success in that area?
Are there any programs to enable women in leadership positions to share experience gained in other government structures?

Methods

We will conduct interviews with government officials at local, regional, and federal levels, in which we focus on the influence women have on priorities and decisions. We will also review Woreda and regional government organizational charts and we will examine secondary data describing the proportions of women in government positions.

12. Water productivity (in intervention areas)

We will discuss household crop and livestock activities, before and after the irrigation intervention.
Prior to your ability to irrigate, what were the three most limiting factors to improving crop yields?
Since you have received irrigation, what have become the three most limiting factors?
Have you changed your cropping patterns or livestock production activities since receiving irrigation? If so, please describe the specific changes.
How have your crop yields increased since you have started irrigating? Please describe the changes quantitatively, by crop.
Are you able to produce more crops per year with irrigation? If so please describe the specific changes in your cropping activities.
Are there any changes in the quality of the crops you produce, as a result of irrigation? If so, please describe the changes very specifically.

How have the health and productivity of your livestock improved since you have started irrigating?

Have the numbers of livestock in your possession changed as a result of being able to irrigate? If so, please describe precisely how the numbers have changed.

Have you noticed any negative implications on crop yields or livestock productivity as a result of having irrigation available? For example, do you have any problems with erosion, salinity, or drainage? If so, please describe very clearly.

From your perspective, what new intervention would enable you to increase your crop yields even more, or to further improve the health and productivity of your livestock?

Methods

We will conduct semi-structured interviews with members of panel households, and we will interview key informants (Woreda officials in agricultural, rural development, and water departments). We will also examine secondary data.

13. Household food security level (in intervention areas)

We will discuss the food security of each household, before and after the irrigation intervention. To begin, please consider the following descriptions of household food security:

A. Generally, my family has too little food and inadequate nutrition. We are not able to consume sufficient food and nutrition on most days.
B. Generally, my family has adequate food, but we lack good nutrition. We often consume sufficient meals, but we are not as healthy as we should be, due to inadequate nutrition.
C. Generally, the adults in my family consume sufficient food and nutrition, but the children do not receive adequate nutrition.
D. Generally, all members of my family have adequate food and good nutrition.

Please choose one of these four statements to describe your household’s situation, before and after gaining the ability to irrigate.

Considering further your household situation, please describe the three most serious constraints to achieving food security before gaining the ability to irrigate. Please describe very clearly how those constraints have changed since gaining the ability to irrigate.

Since gaining the ability to irrigate, have you noticed any general improvement or decline in the nutritional status of household members? If so, please describe the changes very clearly. Also, please describe any impacts those changes have had on
the labor productivity of household members or the ability of children to attend school and to perform successfully on school assignments.

Prior to gaining the ability to irrigate, how much of your food consumption came from producing crops and livestock products yourself, and how much came from purchasing crops and livestock products in a local market? Please describe specific crops and food products.

After gaining the ability to irrigate, how much of your food consumption came from producing crops and livestock products yourself, and how much came from purchasing crops and livestock products in a local market? Please describe specific crops and food products.

Since gaining the ability to irrigate, have you noticed any changes in the prices of food products or other goods in local markets? Please describe specific changes you have observed.

Since gaining the ability to irrigate, how has your income available for purchasing food changed?

Since gaining the ability to irrigate, have you been able to purchase any household products that enable you to process or store food items in ways that were not possible before you could irrigate? If so, please describe very clearly.

Since gaining the ability to irrigate, do you engage in any more or less bartering with your neighbors or other persons involving food items or other goods and services? If so, please explain how your bartering practices have changed.

Additional questions regarding food security:

How do you define food security in your locality?
How do you evaluate your household in terms of the above definition?
Do you think that you have adequate amount of food throughout the year?
If No above, how many months do you consume food from your stock?
How many meals do people normally have in this locality per day?
Do you feel that you have access to your usual daily meals?
Have there been food shortfalls in the past 10 years?
What coping strategies have been used in the past?

**Methods**

We will interview members of panel households and key informants in local government departments. We will also review secondary data and examine selected case studies.
Annex B.
Proceedings of the Validation Workshop Conducted in Addis Ababa, June 7, 2010

Introduction

Mr. Alemayehu Diro and Dr. Sileshi welcomed the participants and briefly addressed the purpose of the Validation Workshop. Mr. Alemayehu announced the workshop’s agenda.

Workshop Participants

- Community representatives from intervention areas
- Stakeholder NGOs from Oromiya, Amhara and Tigray National Regional States
- Line department government officials from the districts and regional states where the intervention areas are located
- IWMI research team
- Oxfam America staff

Adinda van Hemelrijck, with Oxfam America, described the background of the program, from 2008. She discussed the sustainability of Oxfam America’s water intervention program, the multiple use of water, environmental issues, and the concept of water productivity. She also illustrated that the current water productivity program is limited to Oromiya Region, due partly to the recent global financial crisis. She also explained the role of NGOs, the government, communities, and donors in implementing the program. Adinda also described the Measuring Complex Systematic Model and Change Landscaping.

Adinda van Hemelrijck also discussed:

- the 13 impact indicators
- co-investment
- financial capacity of the district
- the role of NGOs
- ethnic and gender issues
- women’s leadership
- sustainable use of water
- market issues, and
- other pertinent topics.
Research presentation

Mr. Buli Ejeta and Mr. Tesfaye Zeleke presented the major findings their research. The findings include:

- inequitable water and land distribution
- men are still dominant in economic and household management
- low prices and poor market linkage
- no value addition mechanisms
- the irrigation schemes are more of traditional type
- low human, material and financial capacity of the government offices in districts
- high interest of the woreda officials in the water productivity projects
- the woredas are unable to use directly the revenue they collect
- most government woreda offices are understaffed
- ambitious government plan on irrigation
- donors invest meager proportion of their budget on irrigation
- less motivation of the experts in government offices because of lack of appropriate equipment, capital, etc
- the need for water is not yet met in intervention areas
- NGOs’ less attention to the gender issues: less females in the offices and less participation of the women in decision making as compared to government offices
- insufficient use of water for irrigation
- though irrigation is contributing a lot to food security attainment, there are still highly food insecure households in intervention areas
- the existing technology and irrigation mechanism is not sustainable and costly

The researchers also recommended areas for additional study:

- market linkage
- environmental sustainability
- co-investment experiences
- water productivity
- institutional setting
After presentation the participants were classified into 4 groups.

1. Community Representatives
2. NGOs Representatives
3. Government Office Representatives
   a) Federal and regional office representatives
   b) Zonal and woreda office representatives

Responses of the Zonal/Woreda Government Group

“How do you measure equity and equality
How ethnicity is a factor of access to water and land
How do you recommend that financial capacity and gender is help to get access to water and land?
The role of population pressure is not well addressed
The case of upstream and downstream in getting access to water must be seen deeply
How do you assure that co-investment is viable?
The role of local knowledge in water productivity is not well addressed
We agree that the women’s decision making power is minimal
Yes, we agree women’s representation is more symbolic”

Responses of the Federal/Regional Government, Donors and researchers Group

“Less NGO participation in irrigation
Inadequate samples
In co-investment side you should start from the Federal/Regional level
Detail assessment of the interest of the NGOs in irrigation”

Responses of the Community Representative Group

“Water supply is not equitable
Market problems related to market linkage, similar crop output and middlemen (brokers)
Unpredictable/changing input and output prices
Water need is not yet satisfied
We accept the problems related to gender balance
Supply of expired herbicides and insecticides
Shortage of water for irrigation
Termites damaging the waterline in Burqitu”

Summary Comments from All Participants
- “Consider the multiple use of water; not only for irrigation
- I do not think that the irrigators at Abine are food insecure
- Some special events/experiences of each intervention area must be elucidated in the report
- Gender issues related to land ownership must be addressed
- We should not wait till her husband dies to empower the woman
- What affirmative action should be addressed to empower women
- The researcher must do rigorous literature review
- To what extent we keep the interest of the donors
- What is the benchmark to say the household is food secure or insecure. Here we should consider the national food security benchmark
- TANGO document might have misled the researchers
- Adequate time must be allocated for data collection, analysis and research writing. Unless the researchers might come up with shallow findings and wrong/unachievable recommendations
- Why all the recommendations are forwarded towards Oxfam America. Recommendations should be more detailed and clearly indicated the duties and responsibilities of each organ
Late Afternoon Session

The participants divided into 6 groups for additional discussion.

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<th>Groups</th>
<th>Male</th>
<th>Females</th>
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<td>Group 1:</td>
<td>8</td>
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<th>Group</th>
<th>Priority areas recommended by groups</th>
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<td>Group I</td>
<td>1. Co-investment</td>
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<td>2. Support to WUA</td>
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<td>3. Market linkage development</td>
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<td>Group II</td>
<td>1. Co-investment legalization and implementation</td>
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<td>2. Baseline data generation</td>
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<td>3. Community capacity building in techniques, marketing, environmental protection, and gender awareness</td>
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<td>Group III</td>
<td>1. Engage regional and federal governments in program strategies and co-investment</td>
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<td>2. Identifying existing studies and experiences</td>
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<td>3. Mapping out potential donors (development partners)</td>
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<td>4. Design clear program engender guideline</td>
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<td>Group IV</td>
<td>1. Co-investment</td>
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<td>2. Assuring gender balance</td>
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<td>3. Assuring water and land resources equity</td>
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<td>4. Market linkage development</td>
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| Group V | 5. Impact analysis  
6. WUA support |
|---------|------------------|
|         | 1. Leveraging resources (Government and donors)  
2. Empower women to participate and benefit for water for multipurpose use  
3. Build capacity of farmers and pastoralists to engage effectively in market and value-chains  
4. Build the capacity of WUA  
5. Conceptualize and define the existing baseline data |
| Group VI | 1. Develop tripartite agreement  
2. Ensuring water and land distribution equity  
3. Market assessment (linkage, value, chain development, and information dissemination)  
4. Basic infrastructure development (road, telecommunication, etc). |