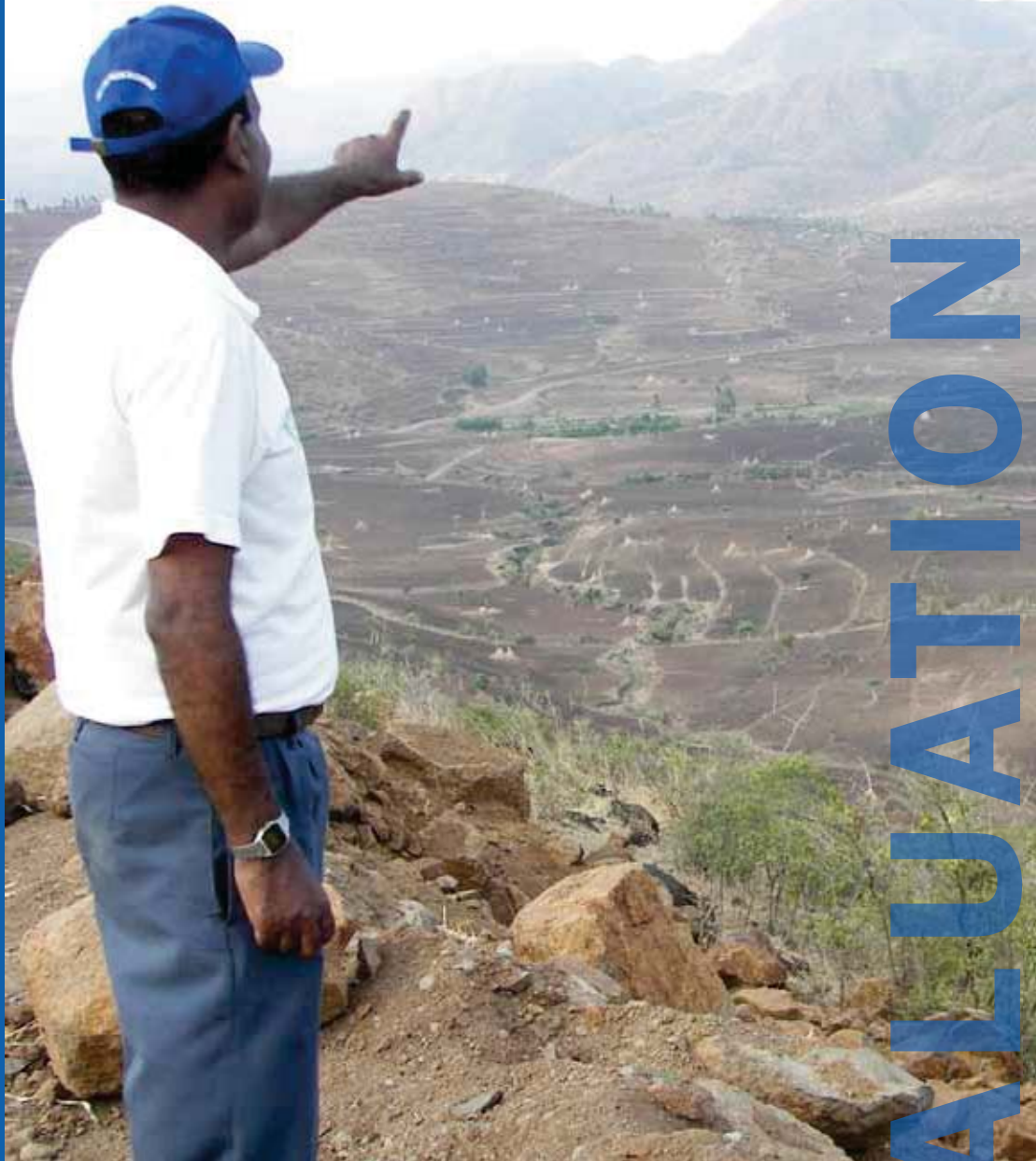


# Transforming Lives

**An Evaluation of  
CRS Integrated  
Watershed  
Management  
Programs in Ethiopia**



**EVALUATION**



# CRS INTEGRATED WATERSHED MANAGEMENT PROGRAM IN ETHIOPIA

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## FURTHER INFORMATION

This evaluation has two additional documents:

**Part II Findings and Recommendations for IWM Projects in Harbu, Adidaero and Legedini** (Harbu 61 pages; Adidaero 64 pages; Legedini 66 pages). This report contains detailed findings for each of the watersheds studied and specific recommendations for further work in these watersheds. Part I, this consolidated report, is based upon the findings from these three watershed evaluations.

**Part III IWM Project Evaluation Documentation (111 pages)**. This report contains the Scope of Work for the Consultants, the household survey instrument, the 18 qualitative questionnaires for leading key informant interviews, focus group discussions and direct observation of project outputs, and the consolidated findings in tabular form of the household survey results.

Part II and Part III reports are not published but are available in electronic form by contacting the CRS Ethiopia Country Office:

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A small girl carries water in Harbu.  
Paul Hebert for CRS.

## ACRONYMS

**AE:** Adult Equivalent

**CHW:** Community Health Workers

**CRS:** Catholic Relief Services

**DAAs:** Development Agents

**DAP:** Development Assistance Program

**EARO:** CRS East Africa Regional Office

**ECC-SDCOA:** Ethiopian Catholic Church  
Social and Development Coordinating Office  
of Adigrat

**ECC-SDCOH:** Ethiopian Catholic Church  
Social and Development Coordinating Office  
of Hararghe

**FA:** Farmers Association/ Kebele

**FHH:** Female-Headed Household

**FGD:** Focus Group Discussion

**FGM:** Female Genital Mutilation

**HE:** Health Education

**HEW:** Health Extension Workers

**HH:** Household

**HTP:** Harmful Traditional Practices

**IHD:** Integral Human Development

**IRR:** Internal Rate of Return

**IWM:** Integrated Watershed Management

**MHH:** Male-Headed Household

**NGO:** Non Governmental Organization

**NPV:** Net Present Value

**NRM:** Natural Resources Management

**PHAST:** Participatory Hygiene and  
Sanitation Transformation

**PSNP:** Productive Safety Net Programme

**SILC:** Saving and Internal Leading  
Communities

**SPSNP:** Support to the Productive Safety  
Net Programme

**SSI:** Small Scale Irrigation

**SWC:** Soil and Water Conservation

**TBA:** Traditional Birth Attendance

**TTBA:** Traditional Trained Birth Attendant . .

**VCT:** Voluntary Counseling and Testing VHC:  
Village Health Committee

**WATSAN:** Water and Sanitation

**WSC:** Water and Sanitation Committee

**WUA:** Water Users Association

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# EXECUTIVE SUMMARY

The Catholic Relief Services Country Office in Ethiopia commissioned a study in April 2009 to evaluate outcomes from its Integrated Watershed Management (IWM) Strategy and Program. The evaluation found that the CRS IWM Program has made significant positive changes in the lives and livelihoods of rural households. Future impacts of IWM projects on rural Ethiopian communities can be significantly enhanced through better initial project planning, more precise component/objective-based budgeting, better defined beneficiary targeting, pre-project component cost analysis to determine the best mix and level of component investments, and more systematic planning for sustainability and phase-out.

## **THE CRS INTEGRATED WATERSHED MANAGEMENT PROGRAM**

CRS began its Integrated Watershed Management Program in 2001 to address in a comprehensive manner the problem of pervasive food insecurity and degraded livelihoods in rural communities in Ethiopia. The approach adopted by CRS and its partners uses watersheds as the primary focus for project interventions. They work directly with communities and the government as partners in protecting and managing the natural resources, and they provide a range of interventions to improve food security and livelihoods of target communities.

The IWM Program, drafted in 2001, has six major objectives:

1. To improve cash and food crop production, leading to food security;
2. To improve soil and water conservation, soil fertility and land management with the use of appropriate biological and physical measures and agricultural inputs;
3. To improve water supply for domestic, livestock and irrigation purposes (multiple use of water – MUS);
4. To increase household income through diversification of agricultural and non-agricultural activities;
5. To empower communities to develop their resources in a sustainable manner through education, training and strategic linkages to government and non-government agencies; and
6. To address other priority needs of the community through integrating relevant sectors such as community-based health education, hygiene and sanitation, savings, and also to increase the status of women and girls within target communities.

To address these objectives, CRS and partners have designed projects using six major components, as well as sub-interventions under each component. These include:

1. Natural Resource Management
2. Agricultural Support and Agro-enterprise Development
3. Multiple Uses of Water (irrigation, domestic water supply – human and livestock use)
4. Sanitation, Hygiene and Health Education and disease prevention
5. SILC (Savings and Internal Lending Communities) and income generation activities

## 6. Cross-cutting: Gender and Partnership Arrangements

CRS and partners use a participatory approach to involve the communities in all aspects of the projects and in assuming primary responsibility for the management of systems put in place.

### THE EVALUATION OBJECTIVES AND METHODOLOGY

CRS chose three representative IWM projects located in different parts of the country – Harbu in central Ethiopia, Adidaero in the north, and Legedini in the east – as the focus for the evaluation. CRS identified the following objectives for the consultant team:

1. To assess the contribution of the IWM Program in achieving food security and improving livelihoods;
2. To evaluate the relative contribution of each of the program components in achieving the overall program objectives;
3. To assess the costs and benefits of the various components;
4. To assess the strategic relevance, appropriateness, efficiency, effectiveness, complementarities and scalability of project interventions and activities on a component-by-component basis, as well as from an overall project perspective;
5. To assess the community management structures, partnerships and strategies (household, community and project) that have contributed towards achieving benefits and program objectives;
6. To assess the factors necessary to ensure sustainability of the systems and structures put in place by the projects; and
7. To identify the lessons from the projects that can help increase the effectiveness of future projects in promoting Integral Human Development (IHD).

Both quantitative and qualitative methods were developed for the evaluation, including household questionnaires, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), activity assessments and case studies. The report is divided into three parts. Part I presents the consolidated findings and recommendations, Part II presents the findings of the individual IWM projects, and Part III presents background documents, the evaluation tools used, and consolidated tabulations from the household questionnaires.

### SUMMARY FINDINGS OF THE EVALUATION

#### Data Availability

The lack of data on costs of project components and on the number of households targeted by the various project interventions proved to be a major obstacle in efficiently carrying out important parts of the evaluation. Project costs were not usually disaggregated by component or intervention, details necessary to carry out proper cost analysis. The consultant team, with help from CRS staff, were eventually able to disaggregate most of the component costs, with some exceptions. The lack of clearly defined household targets for some components also made it difficult to assess the effectiveness of those interventions. In the future, preparation of budget lines and reporting of expenditures in terms of components, in addition to the standard budget lines now used, would greatly facilitate future M&E cost analysis. Likewise, more clearly defined household targets for the various interventions in project proposals would allow more effective monitoring and evaluation of those interventions.

### **IWM contributions to food security and livelihoods**

The IWM projects studied resulted in 1 month of increased food availability in Harbu and Adidaero and 3 months in Legedini through improved crop production, food access through increased household income, and food utilization through improved water supply, hygiene and health, as reported by respondents. Findings relating to improved food availability suggest that specific targeting of the least food secure watersheds and the least food secure households within a target watershed is likely to result in sharp increases in months of food availability from NRM activities on farmlands, agriculture support activities and irrigation. After the project there were still shortfalls in food availability, ranging from an average 3 months in Harbu and Adidaero to 5 months in Legedini. The evaluation found that cash and food-for-work provided through the Government-led Productive Safety Net Programme (PSNP) was a significant factor in filling these gaps in food security, although other coping mechanisms were also used. This finding raises questions about the ability of these communities to cope in the future without support from the PSNP.

The majority of households reported an improvement in their overall living conditions as a result of the projects in all three watersheds: 60% in Harbu, 75% in Adidaero and 98% in Legedini. About the same percentage of households reported that their overall economic situation had improved as well. Most frequently reported were improvements in food availability and income. Respondents in Legedini reported the most profound positive changes in livelihoods. This finding was confirmed by other responses to the household survey and from observations by the evaluation team and from KIIs and FGDs. Overall in all three watersheds, increased food availability at the household level brought improved family cohesion as household members stayed away for fewer months in search of employment to fill the food gaps. In addition, due to the availability of local employment, few people migrated in search of temporary employment, meaning household members were able to stay with their family.

### **Components' Contributions to Program Objectives**

*Improved cash and food crop production:* NRM and agriculture support provided the most significant impacts in improving crop production and the means to maintain production in the longer term. These were achieved mainly through rehabilitation of farmlands, control of soil erosion and water conservation, introduction of compost and manure, improved farming techniques, and in Legedini and Adidaero through the introduction of new seed varieties. The main report discusses the reasons for more limited success in the introduction of new seed varieties in Harbu. SSI made a significant impact in cash crop production in Harbu and Adidaero, but a lesser impact in Legedini mainly due to marketing and transport problems. SSI made impacts on only a small percentage of households due to limited irrigation coverage. Households also reported an increase in the variety of foods in their diet and an overall improvement in their nutrition.

*Soil and water conservation (SWC):* Three components have the most impact on SWC: NRM, agriculture support, and the use of fuel-efficient stoves (indirectly). Physical works through NRM have helped to reduce soil erosion and increase the infiltration of water underground. Better farming practices also contributed to reducing soil erosion and increasing water retention in fields. Fuel efficient stoves are having an impact by reducing by one-half the amount of wood required for cooking and thereby reducing the harvesting of trees from the forests.



*Legedini dry land farmer with his happy family. In addition to improved production on his land, he has a backyard garden and two beehives as a result of the project. They stand in front of their new house with a metal roof built from his recent increased income. Erin Preston for CRS.*

**“The majority of households reported improvement in their overall living conditions as a result of the projects in all three watersheds (60% in Harbu, 75% in Adidaero, and 98% in Legedini). Increased food availability at the household level brought improved family cohesion, as fewer people migrated in search of temporary employment.”**

**“Natural resource management and agricultural support are expensive investments, but together they have made the most important contributions to improving overall food security.”**



Rock terraces to control soil erosion, an example of natural resource management in Legedini.  
Paul Hebert for CRS.

**Multiple uses of water (MUW):** Legedini represents the only example from the three watersheds where irrigation and domestic water have been designed to share the same source. Harbu has multiple uses of one spring source for domestic and livestock uses, and one of the Adidaero irrigation systems shares water for livestock use, but not without some issues over how to share the resource equitably.

**Household Income:** Small-scale irrigation, dry-land agriculture, NRM, SILC and beekeeping all contributed to some extent to the creation of household income. The most significant income was observed for SSI farmers in Harbu and Adidaero, whose HH income from all sources totaled \$1,000 – \$1,500 per year, 2-3 times that of dry-land farmers. However, beneficiaries represented only 11% and 20% of watershed households, respectively. It was not possible to determine the increases in income from dry-land farming, as no pre-project income data was available from the baseline surveys. Irrigation income was lower in Legedini due to the marketing and transport problems noted above. Beekeeping also shows promise as a good income earner but was only fully developed in Adidaero, where participating households were able to earn an average of US\$ 226 per year. SILC was a new and minor component in Adidaero and Legedini, and there was too little data to draw conclusions on income potential, but participants were highly favorable in their opinions about SILC.

**Community empowerment:** Communities in all three watersheds were empowered to some extent by the implementation of all components, mainly through the participatory process used but also from information imparted. The creation of management structures run by community members themselves also contributed to empowerment. The water supply and fuel-efficient stoves provision also contributed to empowerment by providing significant time savings for women, allowing them to more fully participate in family and community decision-making and management structures.

**Addressing other priority needs:** Respondents to all research tools reported that they believe domestic water supply, sanitation (latrines), hygiene and health education were all enormously important in contributing to improved health. SILC has started to show impacts in bringing households together and in creating an environment of savings and lending. These components might have been more effective if it were not for some weaknesses observed by the evaluation team. They included (1) lack of sufficient coverage in water supply and sanitation and fuel-efficient stoves; (2) lack of good hygiene and health practices, despite a high level of knowledge on how to prevent various diseases; (3) continued harmful traditional practices; and (4) a high level of stigma toward HIV positive persons and the continuation of cultural practices that can spread HIV infection, despite the strong messages conveyed during training. CRS now has new participatory learning methodologies and tools for health and hygiene education that they need to begin to apply more vigorously and widely to help to achieve more significant behavioral change.

**Women’s and girl’s status:** More than 90% of respondents in all three watersheds said that women had more voice in community decision-making and in participation in community affairs as a result of the project. Approximately 50% of respondents in all three watersheds also noted that both men and women now share decisions on the use of household income. Despite these positive results, the evaluation found that much more could be done to target women and female headed households for various interventions, and to dig deeper to begin to change behaviors that prevent women from obtaining a higher status and level of participation in community affairs. 100% coverage by water supply and fuel-efficient stoves would provide significant time savings for both women and girls and should be pursued as a means of ensuring that women have more time to devote towards their own empowerment, their participation in community affairs and the support of their families.

### Costs and Benefits of Project Components

The costs of the three IWM projects varied considerably from Harbu (\$293,159) to Adidaero (\$549,829) to Legedini (\$975,000). The Harbu Project was a pilot and relied on CRS's private funds, as did Adidaero. USAID funded the Legedini Project first through the DAP and then through the Support to the Productive Safety Net Programme. Consequently more funds were available in Legedini than for the other two watershed projects.

NRM and Agricultural Support are expensive investments, but together they have made the most important contributions to improving overall food security. Small-scale irrigation was extremely expensive in Harbu and Adidaero, where river intake structures and concrete lined canal systems were constructed and served only 11% and 20% of watershed households respectively. The system constructed in Legedini was much less expensive on a per household basis, but it also served only a small percentage of the watershed population. Overall irrigation farmers reaped higher income than dry-land farmers (by 2-3 times), but the impact of SSI on food security as reported by HHs was less significant for the entire watershed because of the small number of beneficiaries. The challenge of SSI is the inequity in the distribution of benefits, as planned and implemented in Adidaero and Harbu. While SSI is very beneficial to those who receive irrigation, the overall impact on food security in the watershed is not nearly as significant as NRM and agricultural support. Small-scale irrigation would be more worthwhile if the costs can be lowered, as is case in Legedini, the number of beneficiaries can be significantly increased, and poorer households can be targeted.

Consequently, the evaluation team suggests that SSI should be implemented based on meeting certain key criteria regarding costs, benefits, coverage, and equity as discussed in the recommendations.

Water supply, sanitation, health and hygiene education and fuel-efficient stoves contribute to the third pillar of food security – food utilization – but represent less than 10% of the overall budget and have a relatively low cost per household in each of the watershed projects evaluated.

### Evaluation of Project Components based on strategic relevance, appropriateness, effectiveness, efficiency, equity, complementarities and scalability

NRM has proven to be relevant, appropriate, relatively efficient, and equitable in most instances. It complements water supply, agricultural support and irrigation and could be scaled further in each of the watersheds. SSI is relevant as well and having a high impact for those who received irrigation. It is therefore effective and efficient for those who receive benefits, but has less impact than NRM and agriculture support on the overall watershed population. It has **not been** very equitable in providing benefits throughout the watershed and it is difficult to scale up.

The strategic relevance of water supply is unquestionably high. It is the foundation of good health and the key to reducing the workload of women. It is highly cost-efficient and effective in meeting objectives for improving life, and it complements sanitation and hygiene. It is not however easily scalable, since it depends on available water sources and infrastructure. The strategic relevance of sanitation is that people need to be healthy in order to be productive. Sanitation is one of the most important foundations of health. As toilets are low-cost and can easily be constructed by households, they are equitable and spread easily, as shown by the projects evaluated.

Health and hygiene education is also strategically relevant and absolutely necessary to ensure that households have the necessary knowledge to improve their health status through preventative means. The component was efficient with negligible costs, and is an essential complement to sanitation and water supply investments. It was found to be both equitable and scalable.

“Small-scale irrigation was extremely expensive in two watersheds studied, where river intake structures and concrete-lined canals were constructed and served only 11% and 20% of watershed households. While SSI is very beneficial to those who receive irrigation, the overall impact on food security in the watershed is not nearly as significant as soil and water conservation and agricultural support.”



Harbu expensive irrigation structure.  
Tsegahun Tessema for CRS.

“The strategic relevance of water supply is unquestionably high. It is the foundation of good health and the key to reducing the workload of women.”



Adidaero – a community-managed hand pump.  
Tsegahun Tessema for CRS.

### Management structures and partnerships

Community Management Committees were found to be variable in their strengths. Government offices were equally variable in their support to communities. Some cooperatives were strong and growing stronger. The IWM program and projects have progressively aligned with changing government policy during the past 4 years. Today, CRS and the government work closely in partnership to promote the goals of IWM.

### Factors for sustainability

The main factors for sustainability were found to be:

- Strong community committees.
- Adequate training of committee members for the operation and maintenance of water systems, including irrigation.
- Strong support from relevant government offices.
- Continued support from CRS implementing partners after phase-out for a period of time, perhaps two years, with a small budget for this continued support.
- Continued PSNP support of the most vulnerable households in the short term.

### Lessons learned for IHD

CRS uses the Integral Human Development framework for planning and assessment. Thirty lessons described in this report were learned from the evaluation for strengthening projects to promote integral human development.

### RECOMMENDATIONS

1. While CRS and partners should continue their current IWM approach, they should select the least food secure watersheds and the least food secure households to achieve the greatest gains in food security.
2. CRS Ethiopia needs to produce better project proposals, budgeting and reporting to allow for easier monitoring and evaluation of results, costs, and benefits for different components. Indicators found useful for the evaluation are provided.
3. CRS and partners should initiate new projects with multi-disciplinary teams representing the three food security pillars. Teams should ideally be composed of experts in agriculture/NRM, multiple uses of water, health, SILC and other IGAs, as well as a gender specialist and an M&E specialist.
4. SSI deserves special critical attention in future proposals to ensure greater coverage, efficiency and equity. Criteria for deciding on the appropriateness of irrigation for a watershed project are suggested.
5. The poorest households, including landless and female-headed households, require a larger package of income-producing interventions than wealthier households.
6. Certain project components and activities are relatively inexpensive yet contribute to better food security and livelihoods, and therefore should aim to reach every household in every project.
7. Future IWM projects and trained community health workers need to utilize the new CRS tools for discussion and training on HIV/AIDS (We Stop AIDS and In Charge!) along with other participatory methods to help translate knowledge on health and harmful traditional practices into positive action and behavior change.

8. CRS needs to have a clear strategy to help ensure that gains in food security by NRM and agricultural project inputs are sustained and enhanced, even after the departure of CRS and partners from the watershed. Future IWM projects should plan better for sustainability from the beginning and begin preparing a phase-out strategy and systems at least two years before the end of the project.

9. If possible, CRS should go back to the 3 watersheds in this evaluation (Harbu, Adidaero and Legedini) and carry out the recommendations for strengthening and completing the work (see list of recommendations per watershed).

10. CRS and partners should identify gaps and weaknesses in ongoing and completed IWM projects not included in this evaluation and make recommendations for filling the gaps identified.



*Innovative very low cost "Arborloo" toilet in Harbu. After a year or less of use the slab and superstructure are moved to a new location and a tree seedling is planted on the pit. Tsegahun Tessema for CRS.*

**"Sanitation is one of the most important foundations of health. As toilets are low-cost and can easily be constructed by households, they are equitable and spread easily, as shown by the projects evaluated."**

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## INTRODUCTION

The Catholic Relief Services Country Office in Ethiopia commissioned a study in April 2009 to evaluate outcomes from its Integrated Watershed Management (IWM) Strategy and Program. This report presents the findings of that evaluation carried out by a team of consultants supported by the CRS Ethiopia Office during the period April – September 2009.

This evaluation report is divided into three parts. Part I presents the overall findings of the program evaluation based on separate evaluations of three integrated watershed management (IWM) projects, namely Adidaero, Harbu and Legedini IWM Projects. Part II contains the three specific watershed evaluation reports on which the overall report is based and Part III contains evaluation tools, data and backup documentation used in the evaluation. See page iv for further information about how to obtain Part II and Part III reports .



# 1.BACKGROUND

As in many sub-Saharan African countries, most rural households in Ethiopia depend on agriculture for their livelihoods and encounter the same basic problems. These include:

- A near total dependence on rain-fed agriculture
- Lack of agricultural inputs and marketing support
- Use of mostly inappropriate farming technologies
- Incomplete knowledge of sound agricultural practices
- Natural resource depletion and degraded environments due to massive soil erosion in hilly areas, deforestation, over-grazing of livestock and high rates of water runoff during the rainy seasons
- Shrinking plot sizes for farming due to rapid population growth and segmentation of farmland
- Lack of access to potable water and water for irrigation
- Poor sanitation and knowledge of hygiene and good health practices
- A lack of credit and savings for investment and other income generating activities

These problems have led to massive levels of food insecurity, particularly in times of drought, conflict or other disasters, and in some cases destitution, requiring large amounts of food and other emergency aid. The health status of the rural population remains disturbingly low and access to basic services are mostly absent. Presently some 40% of rural households in Ethiopia remain food insecure. Despite the efforts of the government in the past few years to replant tree seedlings, forest cover continues to shrink, occupying no more than 3% of the land area in the country. Less than 5% of farmland in Ethiopia is under irrigation, less than 40% of households have access to clean and accessible water supplies, and less than 25% have access to sanitation.<sup>1</sup>

Since 2002, Catholic Relief Services (CRS) has embraced a new strategy that seeks to address the above noted problems in a more comprehensive manner. The approach provides an integrated package of development inputs and mobilizes rural communities and local institutions as partners with a common vision. It uses the watershed as the primary focus for project interventions with the aim of protecting and managing the natural resources therein, as well as improving the livelihoods of households within the targeted area's communities.

Internal assessments of IWM projects implemented to date by CRS and its partners suggest that this approach is meeting with success in improving food security, health and livelihoods of targeted households, while creating viable community based management structures necessary to sustain the benefits by these projects. This study is the first external evaluation of CRS' IWM program.

## 1.1 GEOGRAPHIC LOCATIONS OF THE IWM PROJECTS

CRS/Ethiopia initiated the IWM strategy in 2002 with the implementation of the Harbu IWM project. This idea of integrating the different development activities within a defined geographical territory was born during the first Development Assistance Proposal (DAP I)



The Harbu watershed. Paul Hebert for CRS.

**“CRS uses the watershed as the primary focus for project interventions with the aim of protecting and managing the natural resources therein, as well as improving the livelihoods of households within the targeted area's communities.”**

<sup>1</sup> Data from World Food Programme, UNOCHA and FAO interviews.

carried out by CRS/Ethiopia between 1997 and 2001. Along with the different monitoring and follow-up activities, the need to integrate the different components of the DAP I and the trend of concentrating different activities in a defined watershed area began with this project, which represented the first learning period for CRS/Ethiopia and resulted in the draft IWM Strategy.

In view of the perceived success of the IWM strategy within the pilot project of Harbu watershed, CRS Ethiopia instituted the IWM Strategy for all of its privately funded development projects as well as for USAID-funded projects.

Since its inception in 2002, CRS reports that approximately 29,651 households have been targeted using the IWM strategy. This does not include projects implemented under the Support to the Productive Safety Net Program or under MYAP, which use a similar IWM approach and which cover multiple watersheds. The characteristics of these projects are summarized in Table 1.1 below.

**Table 1.1: Summary of CRS IWM Projects in Ethiopia**

NAME OF WATERSHED	REGION, ZONE AND DISTRICT	DISTRICT	FUNDING SOURCE	NO. OF BENEFICIARIES (HHS)	STRATEGY	STATUS
Addis Alem	Ahmara, South Wollo	Kallu	CRS private	1,002	IWM	Ongoing
Adidaero	Tigray, Southern zone	Enderta and Seharti Samre	CRS private	1,172	IWM	Completed
Chelleleka and Ellen	Oromia, E.Shewa	Dugba Borra	CRS private	5,282	IWM	Completed
Geba	Tigray, Southern zone	Enderta	CRS private	4,725	IWM	Ongoing
Harbu	Ahmara, South Wollo	Kallu	CRS private	570	IWM	Completed
Leku	Ahmara, South Wollo	Kellela	CRS private	5,146	IWM	Completed
Legedini	Dire Dawa Adm. Council	-	USAID	840	IWM and Support to Productive Safety Net	DAP II completed and SPSNP ongoing
Lugama	Ahmara, South Wollo	Kellela	CRS private	4,800	IWM	Ongoing
Mareko	Ahmara, South Wollo	Kellela	CRS private	2,115	IWM	Ongoing
Rubachea	Tigray, Est Tigray	Glulomekeda	CRS private	3,999	IWM	Ongoing

Information provided by CRS Ethiopia Country Office.

SPSNP and MYAP projects are not included in this table with the exception of Legedini.

Three of these watersheds were selected for this evaluation:

**Harbu IWM, the first IWM project, 2002-2004.** It is located in Amhara National Regional State, South Wollo Zone, Kallu District with an estimated watershed area of 906 ha. It is located about 330 km north of Addis Ababa, the capital of Ethiopia. It is relatively small, containing 4 villages. There are, however, villages residing outside the watershed that benefit from its natural resource management, including water supply. This project was implemented with CRS partner Water Action, a national Ethiopian NGO. This was the first IWM project implemented by CRS and served as a pilot project. As the project was phased out more than 3

years ago, it provided an excellent case study to evaluate the sustainability of project benefits and actions.

**Adidaero IWM, 2003-2008.** Adidaero is located in southern Tigray Zone lying within the Enderta and Seharti Samre Districts, in two kebeles, Maigenet and W/Adikeala. The watershed is located about 30km southwest of Mekele, the capital of Tigray region. The major project implementation area falls in Enderta covering about 3,896 ha. The IWM Project in this watershed was implemented by the Ethiopian Catholic Church Social And Development Coordinating Office of Adigrat (ECC-SDCOA)/Mekele Branch. The project was implemented in two phases. The first phase was completed in May 2005 and the second phase was completed in September 2008.

**Legedini IWM, 2003-2008.** Legedini watershed is located in Eastern Ethiopia within the Dire Dawa City Administration, about 30 kms from the town of Dire Dawa, and within several micro-catchments in Legedini kebele. The people of this area have traditionally been agro-pastoralists and have only begun to settle into more extensive farming within the past 20-30 years. This project was the first large scale assistance provided to this and surrounding watersheds. The project began with direct funding from USAID, under a CRS Development Assistance Program (DAP). With the introduction of the Government of Ethiopia Productive Safety Net Program (PSNP)<sup>2</sup> in January 2005, the DAP program was terminated and transitioned into a new project to support the PSNP (Legedini was one of several CRS-implemented projects that were subject to this transition). The project period lasted from mid-2005 to August 2008. A new phase has now entered implementation, with additional work in the Legedini watershed as well as expansion into adjacent watersheds. The Ethiopian Catholic Church – Social and Development Coordinating Office of Harar (ECC-SDCOH) has implemented this project. Even though the Legedini Project was implemented under a government program, it still incorporated most of the same IWM components as the other two case studies.

Harbu and Adidaero IWM were implemented with private CRS funding and Legedini was implemented with funding from USAID.

## 1.2 OBJECTIVES OF THE THREE IWM PROJECTS

### Harbu

The objectives of the Harbu IWM Project as stated in the project document dated June 2001 were:

1. By September 2004, 250 farmers in the Harbu sub-watershed will have adopted improved varieties of five semi-arid crops, which are proven to have increased productivity.
2. By September 2004, targeted communities in the Harbu sub-watershed will be implementing an integrated land-use plan through which 450 ha is sustainably rehabilitated and managed.
3. By September 2004, average income of 350 households in the Harbu sub-watershed will have increased by 25%.

By its end, the project aimed at increasing the crop productivity and incomes of 250 and 350 households, respectively, by 25% through promotion of improved and high yielding varieties of food and high value crops; providing support in utilization of irrigation and improved crop production techniques; and by conserving 50% of the project's total land area following watershed management principles.

<sup>2</sup> The Ethiopian Government Productive Safety Net Program is a nationwide program which targets approximately 350 food insecure woredas and kebeles throughout the country by providing cash and food-for-work for activities that seek to develop community assets.

**Household targets:** The project document states an overall target of 572 HHs, which is the total number of HHs in the watershed. The document does not state explicitly the individual targets for various interventions, with the exception of objective 1.

### **Adidaero**

The objectives of Phase I were:

1. By June 2005 community members ... will be implementing an integrated NRM plan where 600 hectares of private and communal land is conserved and managed
2. By June 2005, 250 farmers in Adidaero watershed will have adopted one or more of the best performing varieties of three semi-arid crops.
3. By June 2005, average income of 400 households in Adidaero watershed will have increased by 20%.
4. By June 2005, 30% of Adidaero watershed households will have sustainable access to potable water and sanitation.

The project goal for Phase 2 was to improve the food security status of all households in the two watersheds of the two targeted FAs in Samre and Enderta districts. There were three objectives:

1. By April 2008, community members of the two watersheds will be implementing an integrated natural resource management plan where 1300 ha of private and communal land is conserved and managed.
2. By April 2008, 600 households in the targeted watersheds will have increased household financial assets through an expanded agribusiness approach.”
3. By April 2008, 25% of households in the four watersheds will have sustainable access to water for multiple uses and sanitation facilities.

### **Legedini**

The DAP II project covered three Farmers Associations (FAs), of which Legedini was one. The objective of the DAP II Project, as stated in the DAP II proposal revised on October 8, 2002 (ECC-SDCOH), was:

- To reduce the overwhelming poverty of 3 Kebeles in Dire Dawa administrative Council by promoting household food security and strengthening/empowering target community for self help development initiatives.

The project had three strategic objectives each having specific results:

1. “Improve the nutritional and health status children under 5 and pregnant and lactating mothers through improving immunization coverage and promoting maternal childcare by 2006.” By September 2006, by implementing this objectives, the project aimed at increasing the number of immunized children under 24 months of age by 75%; increasing the number of pregnant mothers that receive pre and ante natal care by 50%; and reducing the number of children suffering malnutrition by 30%.
2. “Improve access to potable water and reduce the prevalence of water born diarrhea diseases of the 3 PA village communities by 2006.” By implementing this objective the project planned to reduce the prevalence of water born diarrhea diseases on children by 35%; and increase the number of households with access to sanitation facilities as well as usage of the local level pit latrine by 50% each.



A CRS staff member with a child in Legedini watershed. Erin Preston for CRS.

3. “Improve the institutional/organizational capacity of the user community for identifying, prioritizing, planning and managing the developed schemes by year 2006”. The achievement of this objective would be indicated by an increase in the number of self financed and managed community schemes by 75%.

The goal of the SPSNP as stated in the SPSNP Report, dated December 2007 (ECC-SDCOH), was to decrease the number of the persistently poor requiring food or cash assistance to meet their basic needs. The specific objectives of the SPSNP were:

1. Increase the sector offices’ and the target kebeles’ capacity for partnership in the implementation of food security projects or programs.
2. Strengthen and diversify livelihoods of food insecure households in the target kebeles by increasing the technical capacity of the sector offices and the target kebeles to identify and support innovative solutions to chronic food insecurity.

The major shortcoming of these objectives and indicators was a lack of baseline data with which to compare the results.

### **1.3 IWM PROGRAM RATIONALE**

CRS has provided humanitarian and development services for communities throughout Ethiopia for the past fifty years. Until about 2001, the focus and bulk of the CRS budget in Ethiopia was in humanitarian relief operations. Since 2001, CRS has given increasing attention to longer-term development goals to improve and sustain the livelihoods of poor rural communities. The core strategy, developed by the CRS Regional Office for East Africa and piloted in Ethiopia beginning in 2001, has been to simultaneously implement a number of development components within a watershed or micro-watershed in order to maximize their impact and achieve improved food security and livelihoods among the resident population. The watershed provides a rational focus for physical, economic and social interventions, as well as the proper management of water resources along with other essential and basic inputs necessary for improvements within the defined area.

A *watershed* is defined as any surface area from which rainfall runoff is collected and drained to a common confluence point. Watersheds may be small and definable, very large or even relatively flat. Large watersheds can often be divided into smaller workable units called *sub- or micro-watersheds*. For CRS a watershed or micro-watershed is the workable unit for development activities. It is important to note that a watershed does not respect administrative boundaries, and thus may encompass more than one administrative district or region within the country. At the local level, watersheds can likewise cover more than one kebele.

The CRS Integrated Watershed Management Strategy (IWM) was first drafted in 2001 and piloted in Harbu watershed, Amhara Region from 2001-2004. The overall approach encompassed six major objectives:

1. To improve cash and food crop production, leading to food security;
2. To improve soil and water conservation, soil fertility and land management with the use of appropriate, biological and physical measures and agricultural inputs;
3. To improve water supply for domestic, livestock and irrigation purposes (multiple use of water – MUS);



Harbu water point committee, still functional three years after project completion. Paul Hebert for CRS.

**“CRS emphasizes the creation of community-led management structures to ensure the project’s success and sustainability. Farmers and community members, both men and women, are organized into management committees.”**

4. To increase household income through diversification of agricultural and non-agricultural activities;
5. To empower communities to develop their resources in a sustainable manner through education, training and strategic linkages to government and non-government agencies; and
6. To address other priority needs of the community through integrating relevant sectors such as community-based health education, hygiene and sanitation, savings and lending, and HIV/AIDS (prevention and care).

Since its inception the strategy has also gained one more explicit objective:

7. To increase the status of women and girls within the target communities.

Today, building upon the Harbu experience and refining its objectives, all IWM projects have six major components with the aim of meeting the above objectives. In short, these are:

1. Natural Resource Management
2. Agricultural Support and Agro-enterprise Development
3. Multiple Uses of Water (irrigation, domestic water supply – human and livestock use)
4. Sanitation, Hygiene and Health Education and disease prevention (including HIV/AIDS)
5. SILC (Savings and Internal Lending Communities)
6. Cross-cutting: Gender and Partnership Arrangements

In this report we refer to the major components above, and also refer to these as project interventions. There are also sub-components, which we will usually refer to as project interventions as well (for example, provision of seeds, agricultural training, beekeeping and fuel-efficient stoves).

CRS emphasizes the creation of community-led management structures for each of these components to ensure the project’s success and sustainability. Farmers and community members, both men and women, are organized into management committees such as Village Health Committees (VHC), Water and Sanitation Committees (WSCs), Irrigation Committees/ Water User Associations (WUAs), and Savings and Internal Lending Communities (SILC). CRS provides training for beneficiaries, government line-office staff and community workers, promotion of market-led production, promotion of equitable representation of different social groups and genders, and building local partnerships with government and other organizations.

The overall rationale for the integrated approach is to create multiple benefits at the household level resulting from outputs of the different project components, with the community taking the major responsibility for managing the systems created. Not all households benefit from every project activity, but each household is supposed to benefit from at least one activity or component, and many are impacted by more than one, with the anticipated outcome of improved food security, household income, health and the overall livelihood situation. Some interventions by the nature achieve a high level of coverage, including natural resource management, agricultural support and training, and health and hygiene education. Others such as SILC, beekeeping, and SSI are able to target a smaller percentage of the population. However, for the three projects evaluated, there was no stated CRS strategy for specific targeting of HHs for the various components. With that said, the community was involved directly in the planning process and in decisions concerning the design of the various interventions and therefore did have input into decisions on how the

benefits from the interventions would be shared.

CRS uses a number of different participatory tools in its attempt to fully involve the watershed communities in the development of the various components, including Participatory Hygiene and Sanitation Transformation (PHAST) methodology, community meetings, and various health-related participatory tools developed by the Ethiopia and CRS EARO Offices. Some of these tools are new and were not available during the beginning of the projects evaluated, and some are still in the process of being fully incorporated for CRS and its partners' use in IWM and other projects.

#### **1.4 INTEGRAL HUMAN DEVELOPMENT FRAMEWORK**

This evaluation uses the Integral Human Development Framework (IHD) as a means to understand the dynamics of the IWM projects and to assess the contribution of the projects in making positive impacts on households. The IHD Framework was developed by CRS in 2002 and has been applied to IWM projects since 2005. The individual watershed reports found in Part II of this report present detailed assessments of the contributions of IWMs to achieving integral human development. A discussion of lessons learned from the IHD Framework in the context of this evaluation is presented in Section 5.7 of Part I.

#### **1.5 DESCRIPTION OF IWM PROJECT COMPONENTS**

##### **Natural Resource Management**

Watersheds targeted by the IWM Strategy are drought-prone areas rife with degraded farms and communal land. Soil loss from farmlands is often catastrophic due to rapid runoff and erosion during the rainy seasons. Hillsides and other terrain are degraded due to deforestation, overgrazing and erosion hazards forming large gullies. The NRM component of the project targets the rehabilitation of farmlands and degraded hillsides (private and communal) through physical and biological soil and water conservation measures: terracing, check dams, soil bunds, and hillside micro-basins for catching runoff, area enclosure, and the raising and planting of multipurpose tree seedlings. This has important positive implications on improving the climate, including the recharging of ground water. Livestock development is also integrated into this component through forage supply and livestock management activities. Under this component, income-generating activities are promoted on revived lands, including apiculture, growing of fruit trees and the establishment of communal and private tree nurseries. This component makes a major contribution towards enhancing overall farm productivity.

##### **Agricultural Support and Agro-enterprises Development**

This component focuses in the promotion of agricultural production and productivity by improving access to agricultural inputs such as improved seeds, diverse crops, compost, manure and other improved agronomic practices. In addition the component supports the improvement of business skills and access to finance and to markets, including high-value crops produced under small-scale irrigation. The main tools for this intervention are 1) the promotion of group action, 2) building the capacity of both beneficiaries and other development partners through training and 3) the establishment of market linkages. Seed and livestock fairs are used as a means to mobilize locally available inputs and creating markets for these products. Beekeeping is a subcomponent for landless households and youth who cannot participate in other agricultural training activities.

##### **Multiple Uses of Water**

This component seeks to support the community in developing or upgrading water sources for



A check dam slows water from flowing down a gully and taking topsoil with it, and it increases water infiltration into the soil. Paul Hebert for CRS.

“Soil loss from farmlands is often catastrophic due to rapid runoff and erosion during the rainy seasons. Hillsides and other terrain are degraded due to deforestation, overgrazing and erosion hazards forming large gullies.”

the provision of a potable, convenient and accessible domestic water supply for human use, including for drinking and cooking, washing, construction, backyard gardening, small scale irrigation schemes and other appropriate productive uses, and as well for livestock.

### **Sanitation, Hygiene and Health Education**

This component seeks to support the community in improving sanitation and hygiene, teaching the construction of latrines (standard latrines, Arborloos, and other ecological sanitation designs), providing latrine slabs, and promoting hygiene and household sanitation and education (including proper food storage and shelf construction, personal hygiene, the separation of human and animal living spaces, and provision of fuel-efficient stoves for the household). This component also seeks to improve health status through participatory training in the prevention of malaria, HIV/AIDS, diarrhea and other diseases, as well as imparting information on harmful traditional practices. Hygiene and health education are closely linked and often implemented together by the project. Community health workers are also trained.

### **Savings and Internal Lending Communities (SILC)**

The basic principle of the SILC system implemented by CRS-funded projects is to create savings among members of self-selected groups within a watershed community. The savings then forms a source of loan capital for members of the group to borrow. The cycle of saving and lending is usually time bound, up to 12 months, after which the group liquidates itself and returns the cash saved along with interest. Members agree to save and to borrow as they wish from the accumulated savings of the group for a limited period of time in order to finance various income-generating activities and social events.

SILC is also intended as a tool to build group cohesion and social capital among members, as people are empowered to take charge of the working and dynamics of the group. SILC attempts to build capacity in fair and open elections of committee members, develop transparent by-laws, share responsibilities, improve meeting skills, teach simple bookkeeping (written and oral) and the management of financial systems for savings and internal lending, and create self-reliance and skills for conflict resolution. The SILC approach is particularly suited to the rural poor, especially female-headed households, who can only afford to make very small savings and have no access to formal financial services.

### **Crosscutting Issues - Gender and Partnership Arrangements**

There are a number of crosscutting issues that do not explicitly fall within the above components, including gender issues and partnerships. Gender, and in particular women's and girls' empowerment, are issues of major concern to CRS. IWM projects attempt to focus on involvement of women in all aspects of IWM interventions and management arrangements for the various components and to target women specifically as beneficiaries of project activities.

Partnering with government offices and local implementing agencies is another important part of the CRS implementation strategy, in particular for support and joint implementation both during the project period and following the phase-out of active CRS involvement. CRS has partnered with the Food Security Office of the Government in support of the Productive Safety Net Program since 2005 and relies on government-provided 'cash or food for work' to support the implementation of the Natural Resource Management component of several projects. Direct partnerships have been established with the district cooperatives office, as well as with other respective district offices of Agriculture and Rural Development, Health and Water.

## **1.6 OBJECTIVES OF THE EVALUATION**

CRS has invested several million dollars of private and USAID grant funds in projects using the



IWM strategy since 2002. Donors are increasingly asking for CRS to demonstrate the quality, effectiveness and impact of these projects in achieving increased food security, improved health conditions, improved water and sanitation access and reduction in vulnerability of the poor in rural communities served by these activities. In addition, CRS wants to know how sustainable are the systems and management structures put in place, what are the lessons learned and how can those lessons be applied to future IWM activities.

In late 2008 the CRS Ethiopia Country Office conceived of this evaluation and began planning for the work to be undertaken by a team of consultants. The key stakeholders for the evaluation include the CRS Ethiopia Office, the CRS EARO Office, CRS Headquarters, private donors, USAID, other potential institutional donors, the relevant Ethiopian Government offices, and CRS Implementing Partners.

The overall aim of the study is to provide for CRS, its donors and other stakeholders an objective assessment of the impact of the program on the lives, livelihoods, and food security situation of targeted populations; the potential for sustainability of the IWM activities in project areas once CRS funded project inputs are completed; and an elaboration on the lessons learned from project and program implementation. The following are the specific objectives of the evaluation as stipulated in the Scope of Work:

1. To assess the contribution of the IWM Program in achieving food security and improving livelihoods;
2. To evaluate the relative contribution of each of the program components in achieving the overall program objectives;
3. To assess the costs and benefits of the various components;
4. To assess the strategic relevance, appropriateness, efficiency, effectiveness, complementarities, scalability of project interventions and activities on a component-by-component basis, as well as from an overall project perspective;
5. To assess the community management structures, partnerships and strategies (household, community and project) that have contributed towards achieving benefits and program objectives;
6. To assess the factors necessary to ensure sustainability of the systems and structures put in place by the projects; and
7. To identify the lessons from the projects that can help increase the effectiveness of future projects in promoting Integral Human Development (see Box 1, below).

#### **Box 1: Integral Human Development Framework (IHD)**

The IHD Framework, developed by CRS in 2002 and applied to IWM projects since 2005, is used to evaluate impacts in terms of the creation of household and community assets, including physical, financial, social, spiritual and human, and political assets. IHD also provides a framework to assess impacts related to resilience to shocks, cycles and trends; the role of community and government structures and systems created or utilized within IWM projects; and strategies adopted by households and individuals to effectively utilize assets created, which in turn produce measurable development outputs. Simply put, the IHD Framework is used to capture from the community members' standpoint how they have benefited from project activities and how their lives have been substantially transformed. The IHD Framework is explained in more detail in Annex 1.



*An irrigated fruit orchard in the Harbu watershed. Paul Hebert for CRS.*

*“An objective of the evaluation was “To assess the contribution of the IWM program achieving food security and improving livelihoods.”*



## 2. EVALUATION, APPROACH AND METHODOLOGY

### 2.1 EVALUATION TEAM, TIMING AND EVALUATION COVERAGE

The evaluation team was established in April 2009. One international consultant and two national consultants were hired by CRS to undertake the evaluation. CRS provided a research associate and an intern to work directly with the consultant team on a full-time basis during the evaluation period. CRS and CRS implementing partner staff provided direct support to the consultants during the fieldwork. The CRS Ethiopia Office also provided support in data entry and tabulation.

Planning for the evaluation began in December 2008 with the participation of relevant staff at the CRS Ethiopia Office and the CRS East Africa Regional Office (EARO). The planning included development of the draft Scope of Work, a qualitative pre-evaluation assessment of the Harbu Watershed Project<sup>1</sup>, preparation of consultant TORs and determination of sample IWM Projects for the evaluation. CRS proposed that the evaluation would begin in April and would need to be completed by the end of September 2009.

The Consultants developed evaluation tools and a household survey-sampling frame in April in close consultation with the CRS Ethiopia Office, CRS EARO and the CRS HQ M&E Adviser. Review of reports and internal documents took place in April and May and field survey work in the three IWM Project sites took place during the month of May. Data entry, data analysis and report writing took place in June, July and August.

Photographic and video documentation of the results of the IWM Program will take place in October and early November 2009, to be carried out by a consultant.

### 2.2 SOURCES AND METHODS OF DATA COLLECTION

The questions outlined in the scope of work, explicit outputs expected from the IWM projects as noted in project proposals, and the IHD framework all provided the basis for designing the data collection tools for this evaluation. Both quantitative and qualitative methods were developed, including household questionnaires, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), activity assessments and case studies.

The evaluation process was participatory, involving beneficiaries and non-beneficiaries in the area where IWM projects were implemented as well as other project stakeholders (various government offices, CRS and partner staff). Data from different sources were collected using the different tools noted above, all triangulated with one another to ensure consistency and accuracy. Secondary sources included the project proposals, progress and final reports, health facility records and CRS databases. The field level data collection tools including KIIs, FGDs, and HHQs (involving a total of 482 HHs) are provided in Part III of this report. A list of the key informants interviewed and focus groups met with for each of the evaluation sites is also given in Part III, Annex 3.

<sup>1</sup> This preliminary assessment was used to help develop the qualitative and quantitative survey tools prior to commencement of the field evaluation work in May.

**Table 2.1: Evaluation Tools**

TOOLS USED	HARBU	ADIDAERO	LEGEDINI
Focus Group Discussion	7 groups (47 people)	11 groups (81 people)	6 groups (46 people)
Key Informant Interviews	9	17	6
Households Surveys	160	160	160
Document Reviews	7	6	5
Maps	1	1	1

Enumerators under the direction of experienced supervisors administered the HH questionnaires in each of the three IWM sites. CRS partners took the lead in identifying enumerators and supervisors to conduct the household surveys. The two national consultants screened the enumerators further and trained the supervisors and enumerators at each of the sites for two days prior to the administration of the questionnaires. Following the training, questionnaires were pre-tested to identify gaps or inconsistencies and to acquaint the enumerators with the questionnaire. The consultants randomly checked the filled questionnaires on a daily basis and gave feedback for corrections.

The consultants led focus group discussions personally. The focus groups consisted of beneficiaries of each project component, some non-beneficiaries, committees established to manage the functioning of the project activities, development agents and health extension workers. The consultants also conducted key informant interviews (KIIs) with kebele leaders, cooperative leaders, and woreda level government officials and staff.

During the field-level work the strengths and weaknesses of the projects were thoroughly discussed and analyzed with all interviewees. This ensured the participatory nature of the evaluation and allowed a degree of triangulation of results using both qualitative (KIIs and FGDs) and quantitative (HHQs) tools. The approach involved program stakeholders in both information provision and joint analysis and assessment of the results of the projects reviewed. In addition data gathering and consensus building meetings with implementing partner project staff were conducted during the debriefing of evaluation results following visits to each of the project sites.

CRS selected the three watersheds of Harbu, Adidaero and Legedini for evaluation from among the IWM Projects implemented thus far by CRS. CRS selected watersheds that represented different agro-ecological conditions, regions and peoples, and projects that incorporated all or at least most of the components noted in Section 1.5. At least one phase of each of the IWM Projects had been fully completed at the time of evaluation.



*An evaluation team member interviews farmers in Harbu. Paul Hebert for CRS.*

Quantitative data was collected from a random sample of 482 households (21% female headed and 50% female respondents) from the three sample watersheds. The sampling design is presented in Annex 2 and the HHQ is presented in Part III.

### 3. STRENGTHS AND DIFFICULTIES OF THE STUDY

**Strengths.** This evaluation has used a variety of methods for data collection, allowing for checks to be made against the various findings. Key informant interviews and focus group discussions have allowed impressions to be captured by the evaluation team and enabled probing for a deeper understanding of community viewpoints of project outcomes and impacts. These results have been compared against the random-sample household survey results in order to draw conclusions. With any community based survey there is always the potential problem of respondents providing answers to questions that they feel the enumerators would like to hear, rather than being totally honest in their responses. There is little doubt that this could be true for some questions and for some respondents. However, questions were composed and the enumerators were trained so as to try and avoid this eventuality. Further checks on data comprised a thorough review of project documents and cross checks of questionable results with the implementing partners and CRS staff.

**Difficulties.** There were a number of difficulties encountered in the course of collecting and analyzing data for this evaluation and report, which are listed and discussed below.

- CRS asked that the evaluation team undertake an analysis of costs and benefits of the project components. Two difficulties were encountered regarding this part of the evaluation. First, cost data proved extremely difficult to disaggregate by project component and was not possible for some components (agricultural support, hygiene and health education). CRS staff spent days attempting to collect this data for the evaluation team. The lack of cost data for some components severely restricted the cost-benefit analysis and efficiency analysis for those components. Assumptions had to be made on allocation of common costs, but because records were not kept on allocation of these costs for different components, these assumptions may or may not be very accurate. Where cost data were not available for hardware, unit costs were applied based on CRS experience and then extrapolated based on the number of persons served by the particular intervention. Benefits could only be quantified in financial terms for irrigation, SILC, and a few sub-components of NRM. A traditional cost-benefit analysis was limited to small-scale irrigation. The difficulty of collecting the cost data is actually an important first finding from this evaluation and points to the need for CRS and its partners to rethink how project proposals and budgets are prepared (with budget lines reflecting component costs more explicitly) and expenditures recorded. This is necessary if CRS wishes to streamline its ability to more effectively and easily evaluate costs and financial aspects of future projects. This seems to be the first evaluation that has looked at the financial, cost and efficiency aspects of IWM projects, and therefore there was no previous data to obtain.
- Gathering data on the beneficiary population for the various components also proved difficult. Data from the HHQ, data provided by the implementing partner, and from discussions with management committees and users, were often different and triangulation often had to be made to determine an estimate, often with some degree of uncertainty as to the accuracy of these estimates. This was a particular problem for Adidaero, where numerous and conflicting numbers of overall target beneficiaries from

the project were presented. In this case, CRS made a final estimate of the actual target number of households from the best available data.

- A related difficulty of this evaluation concerned the inconsistency and often lack of well-defined targets in the proposals to be achieved by the various IWM project components. This of course made it difficult, if not impossible, to fully assess the effectiveness of those components. Where targets were presented in proposals, some were very specific, giving the number of target households to be covered by the component or intervention and the outputs expected, while others were extremely general. CRS should look critically at the proposal process and develop a more standard template for IWM Project Proposals, ensuring that staffs include these important elements in all future project proposals. This too will allow more effective monitoring and evaluation to be carried out. It should be noted that CRS is already in the process of working on improving pro-frames and the proposal process. Further recommendations in this regard are included at the end of this report.
- The time allocated for data cleaning, data entry and tabulation, cross checking and correcting data was significantly under-estimated, and these activities resulted in serious delays in starting the analysis and report preparation. About twice as much time was required as originally allocated for this task.
- The fact that for at least two projects more than one project phase was involved further complicated the allocation of costs and other data to the appropriate project intervention. For the case of Legedini, the first phase of the project (DAP II) was actually halted before the projected project ended due to the initiation of the new government-led Productive Safety Net Program (PSNP) that began in 2005. While the general principles of IWM were carried over to the CRS Support to the PSNP project in Legedini, some significant adjustments were made to the program, including a de-emphasis on hygiene and health promotion interventions. It also became difficult to sort out costs and activities, since the PSNP and DAP II projects were actually implemented as a package with combined budgets for all of the projects. However, by and large CRS strategy was already aligned with the overall Government of Ethiopia natural resource management strategy.
- The PSNP program was also being implemented and covered a significant portion of HHs in the three woredas surveyed during the evaluation. For Legedini, PSNP was a direct part of the project with labor being paid out of the PSNP support, which was included as part of the project budget. In Adidaero, PSNP provided cash or food for work for a significant number of HHs after 2005, which contributed towards NRM implementation of some works. The contribution is discussed in the watershed report for Adidaero. In Harbu, PSNP activities began after the IWM Project was completed and public works activities did not significantly overlap with works done under the CRS IWM project.

Partly because of the above difficulties, the evaluation took somewhat longer to complete than had been expected.

## 4. CHANGES IN THE PROGRAM AND PROJECT CONTEXT

Since the inception of the IWM Program in 2002 a number of significant changes have arisen in the program's context, several of which were discussed in Section 3 above. These impacted implementation and may have ultimately influenced in one way or another some outcomes of IWM projects. Changes in the project context that have influenced implementation both positively and negatively include:

### Positive:

- The Amhara regional policy that allows the distribution of communal hillside to households so that they can benefit from the sale of the grass through a cut and carry system, at the same time protecting natural resources and encouraging households to make investments in these lands.
- Land certification legislation and tenure security in Harbu and Adidaero.
- The Productive Safety Net Program (PSNP), introduced in 2005, which standardized implementation guidelines for the entire country as a basis for implementation of public works to build community assets. This continues after the project phase-out, supporting food insecure households.
- As of 2004, the Government's development of their own watershed natural resource management guidelines in full complement to the CRS strategy for NRM. All new projects are required to follow these guidelines.

### Negative:

- PSNP implementation guidelines are strict and resulted in CRS and partners discontinuing or reducing software parts of programs within the CRS Support to the PSNP (Legedini). This had impacts on IWM interventions, in particular for key household interventions, such as health and hygiene education.





## 5. FINDINGS OF THE EVALUATION

Some features of the three populations of the watersheds evaluated are found below in Table 5.1. This information comes from the respondents to the household questionnaire and the features should be representative of the watersheds surveyed. It is noteworthy that the people of Legedini were poorer, had fewer female-headed households, larger families, less formal education and half the months of food availability of Harbu and Adidaero. This indicates that out of the three watersheds, Legedini was most in need of an IWM food security project. This finding points to the need to consider such information in the selection of watersheds for future IWM projects.

**Table 5.1: Some features of the populations of the IWM Projects**

FEATURES	HARBU	ADIDAERO	LEGEDINI
Number of households	160	163	159
FHH (%)	25	26.4	11.3
Average farm land size (ha)	0.69	2.10	2.13
Landless (%)	11.9	2.5	15.1
Average per capita income per Adult Equivalent (AE) per year(explained under income benefits)- US\$	610	657	339
Months of food availability before the project	8.1	8.4	4.0
Children ≤ 15 years old (%)	58	38.5	63.7
Adult equivalent (AE) per HH	1.76	1.83	2.9
% with primary and above education	15.38	17.8	9.3
% with no education	37.18	68.7	80.8
% with adult education	44	6.1	0.7
% with religious education	3.85	7.4	9.3

This section reports the evaluation findings as per the seven objectives stated above in Section 1.



Fuel-efficient stoves, though a minor part of each project, contribute to Food Security Pillar 3: Food utilization. Paul Hebert for CRS.

## 5.1 CONTRIBUTION OF THE IWM PROGRAM IN ACHIEVING FOOD SECURITY AND IMPROVING LIVELIHOODS

The main goal of the CRS IWM is to contribute to household food security by integrating natural resource management, the development of livelihood options including agriculture and agro-enterprise, income generation activities by promoting SILC and agri-business, multiple water uses, hygiene, sanitation and health education. The program components focused on the three major pillars of food security, namely **food availability**, **food access** and **food utilization**. The NRM, agriculture and agro-enterprises and SSI aimed at attaining food availability while the SSI, agri-business, SILC, and skill building for income generation contribute to food access. Water supply, health and hygiene enhance food utilization. These pillars are shown in Table 5.2 below.

Table 5.2: Pillars of Food Security

FOOD SECURITY PILLARS	MEANS	IWM INTERVENTIONS TO ACHIEVE THE MEANS
Food availability	Production	NRM, AG, SSI
Food access	Purchasing power	Income generating activities (Bees, SILC, SSI, gardens)
Food utilization	Water, sanitation, health, cooking facilities, time to prepare food	Domestic water, toilets, hygiene and health education, fuel-efficient stoves

This first question objective of the evaluation asks: To what extent can we attribute changes in food security and livelihoods to the IWM projects? While there are certainly other factors that could have influenced changes, it was clear to the evaluation team that the CRS Projects were the only major agents of change within these watersheds during the project implementation periods. CRS and partner activities were supported by government actions in some cases (mostly in health) that can be and were considered as integral to the CRS activities. There were no significant rainfall anomalies (high or low) that might have had a major contribution to changes within the watersheds.

### Key findings:

- The three IWM projects produced an increase in food security, but with better targeting, more food security could have been secured.
- The majority of households in the three watersheds reported an overall improvement in their living conditions due to the CRS project interventions.

Table 5.3: % of Households Reporting Improved Living Conditions

	HARBU N=160	ADIDAERO N=159	LEGEDINI N=160
# of months of additional food availability	0.9	1.1	3.1
% of HHs reporting improved living conditions	60	75	99

The sample survey revealed that the number of months of food availability increased in all three watersheds as a result of various inputs, principally from agricultural support, NRM and small-scale irrigation. Table 5.3 indicates that the months of food availability in the three watersheds, based on a household's own food production (principally grains in the three watersheds evaluated) or purchase, increased by 1-3 months as a result of the projects. The table also reports that the majority of HHs feel that their overall living condition has improved as a result of the project, but there are some differences between the three watersheds. We discuss these two findings in the paragraphs below.

### Food Availability and Food Security.

The IWM projects in the three watersheds resulted in an overall increase in months of available food, by a fairly modest 1 month for Harbu and Adidaero and a more substantial 3.1 months for Legedini. Legedini is an agro-pastoralist community that has slowly been moving towards more dependence on agriculture over the past few decades. Their agricultural production was very low at the beginning of the project and the average household was significantly less food secure than in Harbu or Adidaero, as noted in Table 5.2. Legedini HHs showed a dramatic increase over the project period, which suggests that targeting watershed communities with less food security at the beginning of a project is likely to result in sharper gains in food availability from project interventions than targeting watersheds that are better off to begin with.



Legedini farmers harvesting red onions.  
Tsegahun Tessema for CRS.

Table 5.4: Average number of months of food availability for households before the project and as of May 2009

	HARBU			ADIDAERO			LEGEDINI		
	MHH	FHH	Average%	MHH	FHH	Average%	MHH	FHH	Average%
Before	8.3	8.6	8.4	8.1	8.2	8.1	4.1	3.7	4.0
After	8.8	9.3	8.9	9.3	8.7	9.2	7.1	7.2	7.1
Change	0.5	0.7	0.5	1.2	0.5	1.1	3	3.5	3.1

MHH = Male headed households  
FHH = Female headed households

For each watershed there has been some increase in the number of households with a full 12 months of food available, with a significant increase in Adidaero and Legedini (Table 5.5). However, the most significant effect has been in reducing the number of households who have less than six months of food available from their own production. The most dramatic change occurred in Legedini, where this percentage dropped from 86.9% to 44.5%, indicating that more than 50% of households were able to raise food availability to six months or more from their own production. This nonetheless leaves a significant food gap for a large percentage of HHs. These households, by the nature of their agro-pastoralist livelihood system, and as confirmed during the evaluation focus group discussions, also supplement HH food requirements with livestock products.

Table 5.5: Percent of HHs with 12 months food availability and < 6 months food availability before the projects and as of May 2009

		HARBU			ADIDAERO			LEGEDINI		
		MHH	FHH	Average%	MHH	FHH	Average%	MHH	FHH	Average%
% HHs 12 mos food	Before	27.2	15.8	24.4	11.5	12.8	11.8	1.7		1.5
	2008	26.7	28.9	25.3	22	11.9	19.4	9.8	7.1	9.5
% HHs ≤6 mos. food	Before	28.2	15.8	17.2	33.6	33.3	33.6	87.1	85.7	86.9
	2008	20.7	10.5	5.8	13.6	21.4	15.6	44.7	42.9	44.5

MHH = Male headed households  
FHH = Female headed households

**“The most significant effect has been in reducing the number of households who have less than six months of food available from their own production. The most dramatic change occurred in Legedini, where this percentage dropped from 86.9% to 44.5%, indicating that more than 50% of households were able to raise food availability to six months or more from their own production.”**

Figures 5.1 to 5.3 show more dramatically the increase in months of available food.

Figure 5.1: Harbu, percentage of households with food availability before and after the project.

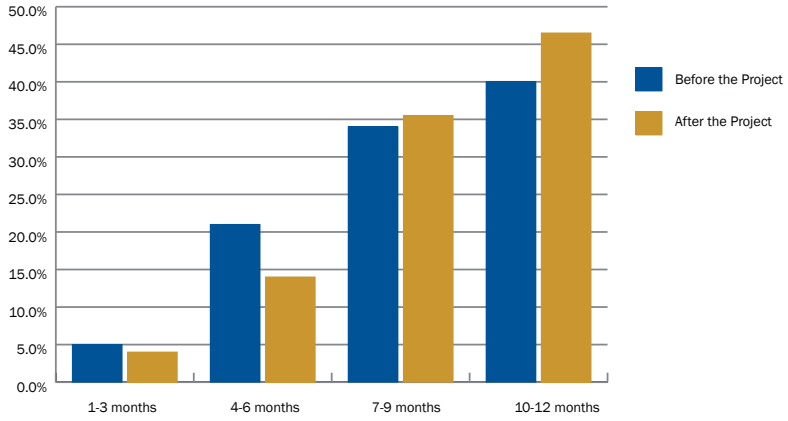


Figure 5.2: Adidaero, percentage of households with food availability before and after the project.

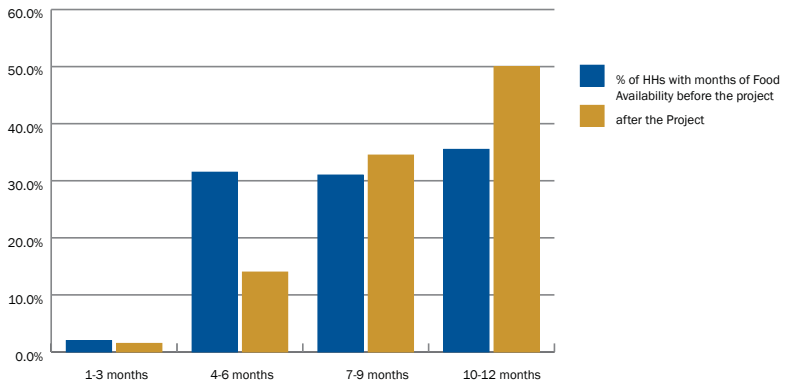
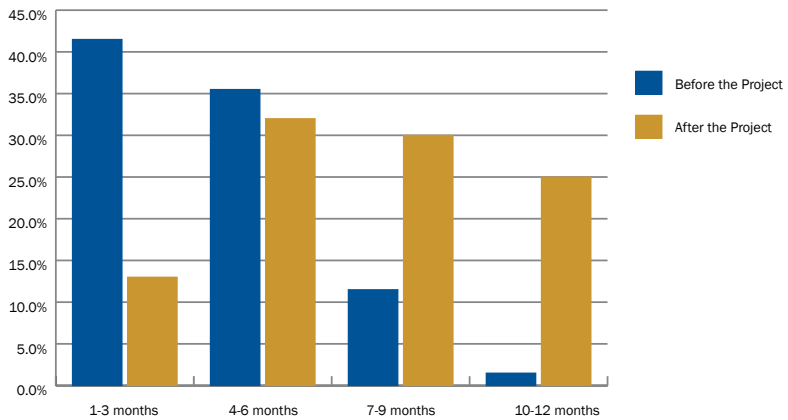


Figure 5.3: Legedini, percentage of households with food availability before and after the project.



These three graphs, and in particular the third graph (Legedini), show that the biggest gains in food availability occurred for HHs that prior to the project had the least food security (less than six months).

The government Productive Safety Net Programme (PSNP) has been a major resource to fill gaps in food availability by providing food or cash for community work. The percentage of HHs who were participating in the PSNP as of 2008, and the average number of months of food or cash received from the program, are shown in Table 5.6 below. The intention of the PSNP is to graduate food-secure households from the program as assets are created. The three IWM projects have placed some households in a position to graduate from PSNP and for others have reduced the number of months of dependency on food and cash support. However, these achievements are tempered by the realization that there is still much work to be done in food security in these three watersheds, and they raise the question of whether CRS should have pulled out and moved on to other areas, or remained in these watersheds to finish the job.

CRS has noted that three years was too short of a project period for Harbu, and it has revised its strategy for all IWM projects to have at least a five-year project life. The question remains, however, as to when it is most appropriate for CRS and partners to phase out of its IWM projects, and this is discussed further under sustainability and exit strategies.

**Table 5.6: % of HHs benefiting from PSNP and average months of food or cash provided**

	HARBU	ADIDAERO	LEGEDINI
% HHs benefiting	22	75	49
No. of months	5.6	3.1	3.1

### Overall improvements in livelihoods

The majority of households reported an improvement in their overall living condition as a result of the projects in all three watersheds; 60% in Harbu, 75% in Adidaero and 98% in Legedini. About the same percentage of households reported that their overall economic situation had improved. Those who reported an improved livelihood situation noted that they found the greatest improvements in food availability and increased income. The majority reported that increased income was used first to meet basic needs, followed by use for improvements in housing, education and medical expenses. About 30% of HHs in Harbu reported no change in their overall living condition. Upon looking at the responses to other HH questions, it seems apparent that these households did not participate in the PSNP, had fewer months of food availability, and were less impacted by the activities of NRM and agricultural support. None were irrigation farmers.

Livelihoods were improved through training and inputs that resulted in increased income and production. The key inputs were agriculture training and livelihood fairs, improved soil fertility and moisture through physical works of NRM and compost and manure, training on beekeeping and SILC, and SSI training and infrastructure. Increases to incomes from these components are calculated in Section 5.3 below.

With increased food availability at the household level, family cohesion has improved as household members stay away for fewer months searching for employment to fill the food gap. In addition, due to the availability of local employment few people migrated in search of temporary employment, allowing household members to stay with their family.



*An irrigation farmer interviewed for the evaluation. Erin Preston for CRS.*

## 5.2 COMPONENT CONTRIBUTIONS TO PROGRAM OBJECTIVE

Box 2 below shows the CRS IWM Objectives.

*Key findings related to contributions of components to the above program objectives are summarized in Table 5.7 and discussed below.*

This is an assessment by the evaluation team, based on both the qualitative and quantitative data and observations from the three watershed projects evaluated. It should be emphasized that the *high, medium, low* and *none* ratings in Table 5.7 refer to the impact principally at the household level, as not all components covered the entire watershed and these are discussed below for each of the objectives.

Food production and increased crop productivity: NRM is a foundation stone component necessary for improvements in food security and livelihoods, reducing risk from climate change and short-term shocks. Since much of the poverty in these three watersheds was in part a result of environmental degradation, if management of the improvements in natural resources is not maintained, the long-term benefits from improved agriculture and water supply will not be sustained.

Table 5.7: Relative contributions of program components to program objectives

PROGRAM COMPONENTS	NRM	Agriculture	Beekeeping	Irrigation	Domestic water	Sanitation & hygiene	Stoves	Health education	SILC
OBJECTIVES									
1. Food production and increase in crop productivity	High	High	None	High	Medium	Medium	None	High	Low
2. SWC	High	Medium	None	Medium	None	None	Medium	None	None
3. MUW	Medium	None	None	NA	NA	Medium	None	None	None
4. HH Income	Medium	High	High	High	Low	Medium	Low	Medium	Medium
5. Comm. empowerment	High	High	Medium	Medium	High	High	Medium	High	High
6. Other needs	None	None	None	None	High	High	Medium	High	High
7. Women's and girl's status	Low	Low	Low	Low	High	High	High	High	High

Note: Backyard gardens were also an intervention, but there was not enough data to judge its overall impact. The rehabilitation

The rehabilitation of agricultural land was a significant part of NRM activities, and thus **NRM can also be considered as the primary contributor to agricultural improvements**, supported by the training and agro-business interventions. These interventions had the most direct influence on improvements in food security and livelihoods for the largest segment of the populations in all of the watersheds. **The projects promoted the use of improved seed varieties in all three communities**, using seed fairs in Adidaero and Legedini to help avail farmers of a variety of seeds. The success varied with a low rate of new seed adoption in Harbu, and better adoption in both Legedini and Adidaero. There was a significant increase in yield for the new wheat variety in Adidaero, but this only translated into 6% higher per capita income and food security compared to non-adopters. Details are presented in the watershed reports. Small-scale irrigation had an important impact on food security for populations directly involved in production of irrigated crops, also producing a greater variety of food, some of which was used for local consumption, but most of which was sold to produce income.

Further discussion and analysis of the contributions of NRM/Agriculture support and Irrigation to food security is included under Cost and Benefits.

Among respondents to the household questionnaire there was an overwhelming opinion that the project had made a positive impact on their diets (Table 5.8). Part of this improvement in diet, especially the increased variety of fruits and vegetables, came from backyard gardens promoted by the project, and part probably came from small-scale irrigation. The analysis did not segregate responses from those having backyard gardens and small-scale irrigation from others. Such an analysis would be enlightening.

**Table 5.8: Availability of vegetables and change in diet of HH (% of respondents)**

RESPONDENTS' OPINIONS	HARBU	ADIDAERO	LEGEDINI
Backyard gardens established as a result of project	19.4	57.1	27.6
HHs reporting improved diet due to the project	44.3	77.1	80.9
<b>How the diet changed:</b>			
More food of the same type as before project	38.6	39.3	55.3
Addition of fruits and/or vegetable	21.4	31.3	17.0
Generally more variety than before the project	64.3	36.2	21.4
HH feeling positive impact of diet change on health	83.8	71.2	99.2



*A girl in Legedini shows improved seed varieties provided by the project. Erin Preston for CRS.*

### **Box 2: CRS IWM Overall Program Objectives**

1. To improve cash and food crop production, leading to food security.
2. To improve soil and water conservation(SWC) soil fertility and land management with the use of appropriate, biological and physical measures and agricultural inputs (Improved Natural Resources Base).
3. To improve water supply for domestic, livestock and irrigation purposes (multiple use of water – MUW).
4. To increase household income through diversification of agricultural and non-agricultural activities.
5. To empower communities to develop their resources in a sustainable manner through education, training and strategic linkages to government and non-government agencies.
6. To address other priority needs of the community through integrating relevant sectors such as health, hygiene and sanitation, savings and lending, and HIV/AIDS (prevention and care).
7. To increase the status of women and girls within the target communities.

**“The introduction and spread of fuel-efficient stoves has resulted in a savings in Harbu and Legedini of 50% of wood used for cooking.”**



A woman in Harbu watershed shows her fuel-efficient stove. Behind her is hygienic shelving promoted by the project. Paul Hebert for CRS.

**Soil and water conservation (SWC):** NRM, agriculture, irrigation and stoves are the contributors to SWC. NRM introduced terracing and soil bunds on farmlands, check dams, planting of trees and other vegetation, closure of hillsides to allow vegetation to regenerate, and micro-basins to capture water. The impacts have been reported as high in all watersheds, resulting in increased soil and water retention, increased recharging of ground water and revival or increase of flows of springs and rivers (according to perceptions by watershed households and woreda water offices). Training of farmers within the Agriculture and Irrigation components has also imparted knowledge of better practices to conserve soil and make optimum use of available water. Furrow irrigation is used in most irrigated fields, resulting in high water use. While some limited use has been made of drip irrigation and other conservative means of irrigation, there remains a high potential for water savings by expanding the use of more modern irrigation conservation measures. The introduction and spread of fuel-efficient stoves has meanwhile resulted in a savings in Harbu and Legedini of, on average, 50% of wood used for cooking. The longer-term impact should be a reduction in harvesting of wood from trees in the watershed, having a positive impact on both soil and water conservation.

**Multiple Use of Water (MUW):** CRS has attempted to maximize the benefits and efficiency of water source development and use for irrigation as well as water supply for domestic and livestock purposes, washing basins and bathing, promoting multiple use of such sources and systems where possible. *Legedini represents the only example from the three watersheds where irrigation and domestic water have been designed to share the same source.* Elsewhere separate storage and distribution systems were designed to deliver water for irrigation and domestic use. In Harbu, one domestic source was used for drinking and for livestock watering as well as for washing and bathing, which did result in multiple benefits. In Adidaero irrigation water was used for livestock watering, but this resulted in conflicts between irrigation farmers and other households who used the water for livestock. There would appear to be a potential for greater consideration in the planning stage for more effective multiple use of spring, river, and deep well sources.

**Household Income:** *Irrigated Agriculture, Dry-land agriculture, NRM, SILC and Beekeeping all contributed to some extent to creation of income.* Excess income created by some irrigation farmers has been invested in other enterprises as well, including fattening of ruminants for sale, buying of houses in nearby urban centers for rent, and starting of grain mills in at least two instances. Irrigation farmers earned significant income from the sale of their vegetable and fruit crops, enjoying the largest increases in household income associated with the project (without considering payments made for labor by the project or PSNP). Table 5.9 and Figure 5.4 below show the income earned from these interventions in the three watersheds. It is also striking that irrigation farmers earned more income from dry-land farming than the non-irrigation farmers. The reason for this is most likely that irrigation farmers received more intensive training on agriculture than the dry-land farmers and this training benefited their dry-land farming. Adding together irrigation farmers' incomes from both their irrigated and dry-land crops, irrigation farmer households earned two to three times that of farmer households that could not participate in irrigation.



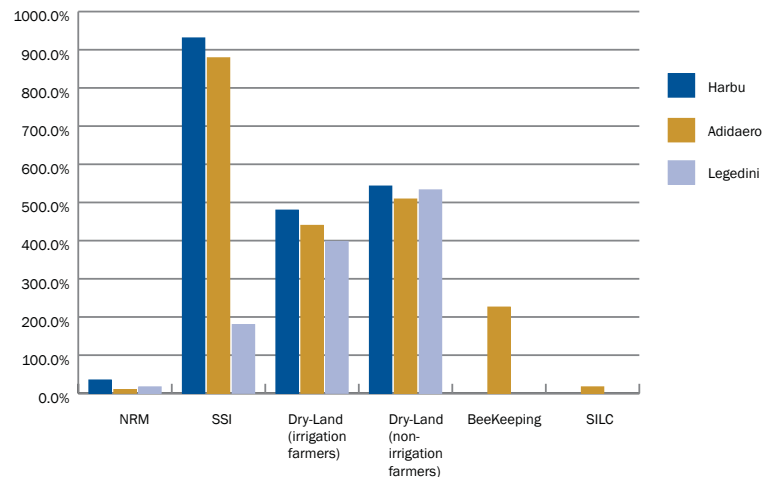
Table 5.9: Income earned from project interventions – US\$/yr.

		HARBU			ADIDAERO			LEGEDINI		
		# of HHs	Ave. HH Income	Total for watershed	# of HHs	Ave. HH Income	Total for watershed	# of HHs	Ave. HH Income	Total for watershed
<b>NRM</b>		400	35	14,000	120	10	1,200	653	17	11,101
		61	931	56,836	233	879	196,017	90	180	16,920
<b>Rain-fed Agriculture</b>	1	547	480	262,326	864	440	380,160	790	398	314,420
	2	61	543	33,145	233	509	118,597	90	533	47,970
<b>Beekeeping</b>		30	NA	NA	170	226	33,900	54	None	None
<b>SILC</b>		—	—	—	120	17	2,040			

1 – Dry-land farmers (current overall income; income prior to project was not available.)

2 – Irrigation farmers who also practice dry-land farming (also current overall income)

Figure 5.4: Average annual HH income from different project components (US\$/year)



“CRS has attempted to maximize the benefits and efficiency of water source development and use for irrigation as well as water supply for domestic and livestock purposes, washing basins and bathing, promoting multiple use of such sources and systems where possible.”

**Community Empowerment.** The project in all three watersheds worked to empower the communities of the watershed through full involvement by community members in most aspects of project design, planning, implementation and operation. Thus, every component contributed to some degree to community empowerment. This was done through the participatory methods used by CRS and its partners. Community meetings were held to address the various stages of the project and involved all segments of the population. The community elected members to serve on management committees, who are responsible for all aspects of managing the operation, establishing by-laws and operational rules, maintenance and enforcing by-laws. CRS and its implementing partners provided support in this process. These committees were found to be functioning well in most instances and were recognized by the community members to both represent their interests and to be doing a good job in managing the components and interventions (greater than 80% of HHs in all three watersheds evaluated reported satisfaction with the overall operation of committees). The evaluation team did note that some committees performed better than others, some



Multiple-uses of water in Adidaero, irrigation water captured for clothes washing and livestock watering. Paul Hebert for CRS.



Three women water committee members in Harbu watershed. Paul Hebert for CRS.

*“More than 90% of respondents in all three watersheds said that women had more voice in community decision-making and in participation in community affairs as a result of the project.”*

*The researchers concluded that women could participate more if water supply coverage and fuel-efficient stoves could reach 100% of households, freeing a great deal more of women's time from collecting water and firewood.”*

were not functioning at all, and some had stronger relations with relevant local government offices than others. Most often weak relations with government offices were actually due to the weakness of the office and not of the committee. The communities felt a high degree of responsibility for the project interventions, but in all three watersheds they also voiced their concern that the partners and the government needed to stay involved longer to assist the community in managing the systems and structures put in place by the project, beyond its official completion.

**Addressing other priority needs:** *The other priority needs of all three watersheds related primarily to health and the need to help families save and invest their income. The domestic water supply, sanitation (latrines), hygiene and health education, and fuel-efficient stoves were all enormously important in contributing to improved health.* The impact on health of these interventions was measured qualitatively. Beneficiaries expressed appreciation for the knowledge they had gained and believed that their health was improving as a result. These components might have been even more powerful were it not for certain weaknesses found by the evaluation: (1) lack of sufficient coverage in water supply and sanitation and fuel-efficient stoves; (2) lack of application of a high level of knowledge on how to prevent various diseases and to address HTPs (which were still being practiced), and (3) the high level of stigma toward HIV positive persons and the continuation of cultural practices that can spread HIV infection, surviving despite the strong messages conveyed during training. The methodology that CRS and its partners used has shown high impact in terms of creating awareness of most of the health messages that the evaluation measured. However, the adoption rate on this knowledge was observed to be low. CRS now has stronger methodologies and tools for health and hygiene education that they need to begin to apply more vigorously and widely to help to achieve more significant behavioral change. Also disappointing was the finding in Legedini that hygiene and health education activities were greatly reduced when the project moved from DAP II to Support to PSNP in 2005. CRS indicated that in the next phase of the UASID-funded Support to PSNP program beginning in 2009, they would attempt to re-instate a strong health and hygiene component.

**Women's and girls' status:** *More than 90% of respondents to the household survey said that women had more voice in community decision-making and participation in community affairs as a result of the project.* Approximately 50% of respondents in all three watersheds also noted that both men and women now share decisions on the use of household income.

The Cross-cutting component, which focused on gender and partnerships, encouraged project staff to consider gender in the implementation of components. The insistence of the project that women should be represented on committees was a great start for building women's empowerment in the community. Women played a prominent role as members of the water and health management committees in all three watersheds. Three of the seven members of every water committee were women members and women were in the majority on all health committees in all three watersheds. However, in all three watersheds the evaluation team found that it was the men who always occupied the positions of officers in the water committees. There was less participation on irrigation committees as women landowners make up a small percentage of irrigation farmers. There were also fewer women participating in NRM activities and serving on the relevant NRM committees. Only one woman was found to be serving on the Watershed Management Committee in Harbu and none on the same committee in the other two watersheds. So while there are good examples of women's participation on these committees, there is much more to be done to further such involvement and to allow women to play more prominent roles on these committees.

Women were the principle target within all households for hygiene and health education training and promotion. About 75% of HHs participated in hygiene and health education training in Harbu and Adidaero and more than 90% in Legedini. CHWs reported that the majority of the participants were women, but no exact gender breakdown is available. The detailed evidence for the above is found in the evaluation reports of the three watersheds.

Women were the chief beneficiaries of water supply and fuel-efficient stoves, thanks to the large amounts of time saved from collecting water and fuel wood. From three to eight hours per day per household (depending on the watershed) of sheer physical drudgery were saved among households who benefited from these two interventions combined. Half or more of women beneficiaries in Legedini and Harbu watersheds enjoyed this combined time-savings. In Adidaero, where stoves were not provided, women on average saved two hours per day from collecting water. In any case, such time savings were recognized by beneficiaries as the most important benefit of the water supply and fuel-efficient stoves provided by the project. Women reported that the time savings were largely used for managing their households better, preparing food and serving on time, more attention to their children, income-generating activities and participation in community affairs and SILC. For girls the benefit was more time for school and study. All of these benefits contribute to increasing women's status and empowerment.

### 5.3. COSTS AND BENEFITS OF THE PROJECT COMPONENTS

**Cost data.** The terms of reference asked the consultants to evaluate the costs and benefits of each IWM component. However, it was difficult to ascertain the cost of some components because CRS budgets were not created in most cases to reflect costs in terms of components. The typical budget categories were salaries, administration and other shared costs, training, NRM, irrigation and water supply. Agricultural and agro-business support was only available for Legedini. Estimates, based on other data available from CRS and partners, had to be made of agro-business support (for Harbu), sanitation (cost of hardware), health and hygiene education (Harbu only), SILC, fuel-efficient stoves and beekeeping.<sup>4</sup>

**Benefit data** were quantified for irrigation, water supply, beekeeping, SILC, stoves, and for some benefits of NRM and agriculture.

**Food security benefits** were quantified in terms of months of additional food available for irrigation and dry-land farmers.

**Income benefits** were quantified for agriculture, small-scale irrigation, beekeeping, SILC (for some groups), and some NRM activities (sale of grass and wood products). Income data from sale of livestock was not available.

**Benefits of other interventions could not be quantified in monetary terms.** Water supply benefits were calculated in terms of time-savings for women and girls. Health benefits from hygiene and health education and from water supply and sanitation could not be quantified.



In Harbu the community Health Committee was made up largely of women. Paul Hebert for CRS.

**“Women played a prominent role as members of the water and health management committees in all three watersheds.”**

<sup>4</sup> The costs were generally found in terms of Ethiopian Birr and were converted to US\$. The interbank exchange rates varied by less than 5% between 2002 and the end of 2007 (ranging from 8.8 to 9.2 ETB/US\$), when most of the investments were made within the 3 watersheds. Consequently, an average of 8.9 was used to convert the investments from ETB to US\$. There with a relatively larger increase between the end of 2007 and the end of 2008 (7% increase), and the income data was for the most part from 2008. So for converting income, an exchange rate of 9.8 ETB/US\$ was used.

“Natural resource management in all three watersheds was the most critically important investment in achieving increased food security and livelihoods. NRM has also provided other benefits by rehabilitating the local environments, spurring reforestation, providing grass for animals and wood products for local use and income, and also providing a buffer against future shocks.”



Landless households (about 11%) harvested and sold grass from enclosed areas, increasing their incomes, an example of the income benefit of NRM. Tsegahun Tessema for CRS.

### Key findings:

1. The cost of components varied significantly across the watersheds and therefore it is important to understand the reasons (discussed below) for this variation in order to identify ways to provide benefits from investments at the lowest cost possible.
2. Benefits per household from the different components did not vary significantly across the watersheds, despite the difference in investments made in each, with the exception of an increase in HH food availability and lower SSI income in Legedini. It is important to understand why (as discussed below) different investments resulted in similar benefits.
3. NRM combined with Agricultural Support are expensive investments by CRS, but have had the most important contribution to improving overall food security. NRM has also provided other benefits by rehabilitating the local environments, spurring reforestation, providing grass for animals and wood products for local use and for income, and also providing a buffer against future shocks. Consequently, NRM was the most critically important investment in achieving increased food security and livelihoods.
4. Small-scale irrigation was extremely expensive compared with other components in Harbu and Adidaero, where river intake structures and concrete lined canal systems were constructed. The Harbu SSI benefited a small percentage of watershed households (11%). The Adidaero irrigation systems served a slightly larger percentage of HHs (20%) thus bringing down per household costs somewhat. The system constructed in Legedini was much less expensive on a per household basis, but it still served only a small percentage of the watershed population. Overall, the irrigation farmers reaped 2-3 times the income of dry-land farmers, but SSI impact on food security as reported by HHs was less significant for the entire watershed because of the small number of beneficiaries. Consequently, the evaluation team suggests that SSI should be implemented based on meeting certain key criteria regarding costs, benefits, coverage, and equity as discussed below and in the recommendations.
5. Other interventions, including domestic water supply, sanitation, hygiene and health education, fuel-efficient stoves, SILC and apiculture, combined accounted for between 7% and 15% of total project cost across the three watersheds, yet produced measurable and life-enhancing benefits for households. Water supply, sanitation, health and hygiene education and fuel-efficient stoves contribute to the third pillar of food security – food utilization – and represent less than 10% of the overall budget in each watershed project. SILC and apiculture contribute to the second pillar, food access.

The costs for each of the components/interventions are shown below in figures 5.5, 5.6, and 5.7.

Figure 5.5: Percent of total investment costs for Harbu components

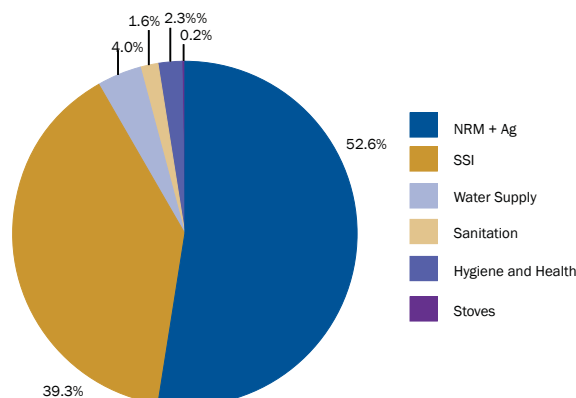


Figure 5.6: Percent of total investment costs for Adidaero components

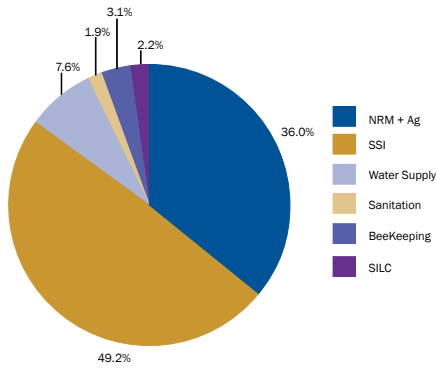
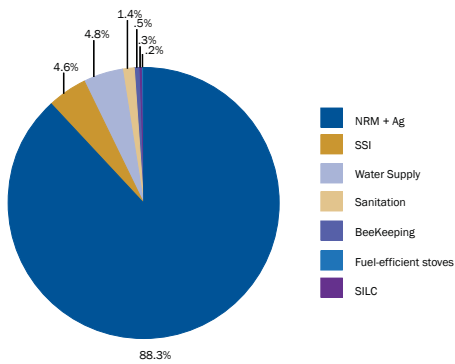


Figure 5.7: Percent of total investment costs for Legedini components



Harbu housewife proudly shows her new kitchen shelving, a result of project health and hygiene education. Paul Hebert for CRS.

The costs and coverage for the different components are summarized in Table 5.10.

Table 5.10: Costs and coverage by different components

Components	HARBU HARBU = \$293,159 (570 HH)			ADIDAERO = \$549,829 (1,172 HH)			LEGEDINI = \$975,000 (840 HH)		
	% HH	US\$ per HH	% of Budget	% HH	US\$ per HH	% of Budget	% HH	US\$ per HH	% of Budget
NRM + Ag.	70	<b>386</b>	52.6	79	<b>214</b>	36.0	76	<b>1,122</b>	88.0
SSI	11	<b>1,890</b>	39.3	21	<b>1,161</b>	49.2	11	<b>483</b>	4.6
Water	38	<b>55</b>	4.0	83	<b>43</b>	7.6	81	<b>68</b>	4.8
Sanitation	87	<b>11</b>	1.6	80	<b>11</b>	1.9	41	<b>29</b>	1.4
Hygiene and Health Ed.	77	<b>18</b>	2.3	92	<b>NA</b>	—	74	<b>NA</b>	—
Beekeeping		<b>NA</b>	—	15	<b>99</b>	3.1	6	<b>100</b>	.5
SILC	—	<b>----</b>	—	10	<b>105</b>	2.2	11	<b>19</b>	.2
Stoves	47	<b>1.43</b>	0.2	—	<b>----</b>	—	30	<b>11.2</b>	.3

“Water supply, sanitation, hygiene and health education, fuel-efficient stoves, SILC and apiculture, combined accounted for between 7% and 15% of total project cost across the three watersheds, yet produced measurable and life-enhancing benefits for households.”

## Discussion of Key Findings

The above major findings are discussed in the following paragraphs.

Referring to finding 1 above, what explains the difference in the variation in costs? This question will be answered below on a component-by-component basis. But it is worthwhile to note that the overall project budgets varied considerably between Legedini (\$975,000), Adidaero (\$550,000) and Harbu (\$293,000), meaning there were more funds for Legedini to allocate to project components than for either Adidaero or Harbu. Second, CRS and partners allocated costs in relation to the importance of the key objectives to food security and livelihoods.

Referring to finding 2 above, the benefits of the various interventions are summarized in Table 5.11 and these will also be discussed in the following paragraphs.

Table 5.11: Benefits of various interventions

COMPONENT		BENEFITS BY WATERSHED (INCOME IS \$/HH/YR) (% OF WATERSHED HHS BENEFITING)		
		Harbu	Adidaero	Legedini
NRM + Agriculture	1. Income - all NRM sources			
	2. Grass for animals			
	• Also for house construction, shelving, etc. (NQ)	\$35 (46%)	\$15 (10%)	\$17(4.5%)
	3. Income (rain-fed agriculture)	3 mos. (73%)	– 2 mos.	2.5 mos. (65%)
	• SSI farmers	543 (20%)	(79%)	\$553 (11%)
	• Dry-land farmer	480 (98%)	509 (11%)	\$398 (94%)
4. Other benefits (NQ)		440 (79%)		
	• Replenishing water table			
	• Improved micro-environment			
	• Bio-diversity improved			
Irrigation	Additional Income	\$931 (11%)	879 (20%)	\$170 (11%)
Domestic water supply	1. Daily time savings/HH	2	2	4-6
	2. Health	NQ	NQ	NQ
	3. Backyard gardens			
Sanitation (latrines and arborloos)	Health	NQ	NQ	NQ
	Production of fruit, vegetables and soil fertility(Arborloos)	NA	NA	NA
SILC	Income	—	17	8
Stoves	Time savings	1.5 hrs	—	2.3 hrs
Beekeeping	1. Production		1350 kg/yr	
	2. Income	NA	\$226	NA

NQ – Benefit could not be quantified NA – Data not available

**NRM and Agricultural Support** in Legedini used a higher proportion of the overall budget, 88%, due to the need for massive rehabilitation of farmland and use of water and soil conservation measures, as well as the lower cost for training and demonstration. The NRM alone required high labor input, which represented 73% of the overall budget. The somewhat lower costs per HH for NRM in Adidaero can be explained by the higher population density and overall population who benefited, but with a land area under closure and rehabilitation not too much larger than that for Harbu. The budget required for NRM in future projects will consequently be dependent on the overall land area needing to be covered, the population and the extent of rehabilitation needed, particularly on farmland, and of course whether CRS continues to give the highest priority to food security.

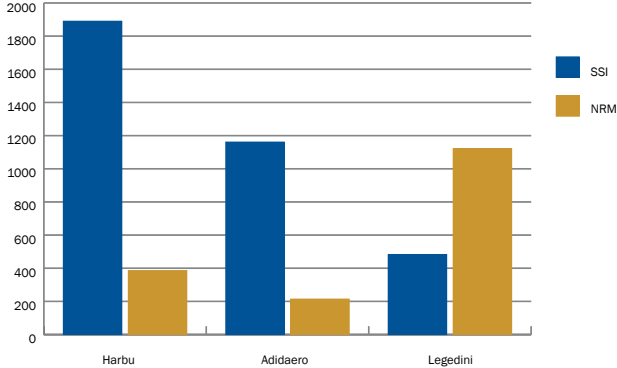
The months of additional food availability in Harbu and Adidaero were about 2 months on average lower than Legedini. The larger investment for Legedini paid off in increasing the months of food availability by 3 months average across the watershed, most likely because they started at a much lower level of food security, 4 months, as compared to 8 months in Harbu and Adidaero. NRM has also provided other benefits by rehabilitating the local environment, reforestation, providing grass for animals and wood products for local use and for income, and providing a buffer against future shocks.

**The irrigation systems** with river intake and concrete canals cost nearly \$2,000 per HH in Harbu and over \$1,000 per household in Adidaero. In Legedini the system was far less expensive at \$483 per household, in part because it capitalized on an existing borehole which only needed to be rehabilitated. The costs were also shared with the domestic water system, which used the same source. Even if the cost of constructing the borehole were added in (about \$20,000 to \$30,000), the costs would still remain far lower than in Adidaero or Harbu. The lower cost system in Legedini suggests that CRS might wish to consider such pumped systems or other lower cost technologies in the future where possible.

The investment costs of irrigation per hectare varied significantly among the three watersheds - Harbu \$10,981, Adidaero \$1,592, and Legedini \$4,539 - indicating that costs are inversely proportional to the size of the command area, but also directly proportional to the overall type of system.

Comparing the cost per household for NRM and SSI in Harbu and Adidaero, SSI is dramatically more expensive. However, in the case of Legedini, SSI is about 40% of NRM per HH, which further supports the conclusion that the technology used for SSI can have a dramatic impact on costs.

Figure 5.8: Cost per household of NRM and SSI in three watersheds



The benefits from irrigation were principally in the form of increased income for irrigation farmers, reaching 2-3 times that of dry-land farmers. Income was considerably lower in Legedini than in the other two watersheds because the farmers were not able to utilize the potential productivity of the irrigable land, were likewise unable to access the Dire Dawa market, and employed poor post-harvest management, especially for perishable produce. A benefit/cost analysis for the Adidaero irrigation systems showed a benefit to cost ratio of 4.4 to 1 and an internal rate of return of 204%. This indicates that the Adidaero system, taken by itself, proved to be an economical investment for those beneficiaries targeted.

*Referring to finding 3 above, we will compare food security cost and benefits for NRM/Agri. and SSI. Improving food security is the primary focus of IWM in Ethiopia, and CRS has attempted to address this objective principally through investments in 1) NRM and other support to rain-fed agriculture and 2) small-scale irrigation. We have already seen that there is a wide range in the costs of these systems and in their coverage of watershed populations. How can we objectively compare the relative contributions of these components in terms of their costs and benefits? We will do this by looking at the costs and the benefit in terms of months of food availability produced by these investments.*

Table 5.12 analyzes the cost and benefits of investments in irrigation and in NRM/Agricultural support for rain-fed agriculture for achieving higher levels of food security in Harbu, Adidaero and Legedini. This table and Figure 5.8 both show that NRM and agriculture support for dry-land farmers produced more months of food security than did small-scale irrigation. This was mainly because the irrigation systems served a small percentage of households, but also because irrigation farmer HHs reported only a slightly higher increase in months of food availability compared to the non-irrigation farmers, despite having much higher incomes. We will discuss this point further below.

The table also shows that in Harbu and Adidaero, where the project constructed irrigation with an expensive river intake and concrete-lined canal system, the costs required to produce one additional month of food availability from irrigation is 8-10 times the cost of achieving one additional month of food availability from NRM and agricultural support interventions. The cost of each additional month of food availability shown in Table 5.9 (last column on right) is calculated by dividing the total investment cost for SSI and NRM/Ag support by the total number of additional months of food availability reported by respondents. This point is also illustrated in Figure 5.9.

It is noteworthy that the cost of an additional month of food availability from SSI is high in Harbu (\$3,150) and in Adidaero (\$1,161) and much lower in Legedini (\$110). This is because in Legedini the irrigation system proved to be less costly due to the fact that it was a less expensive borehole system, the borehole was already in place, and the system was multiple-use, sharing costs with the domestic water system development.

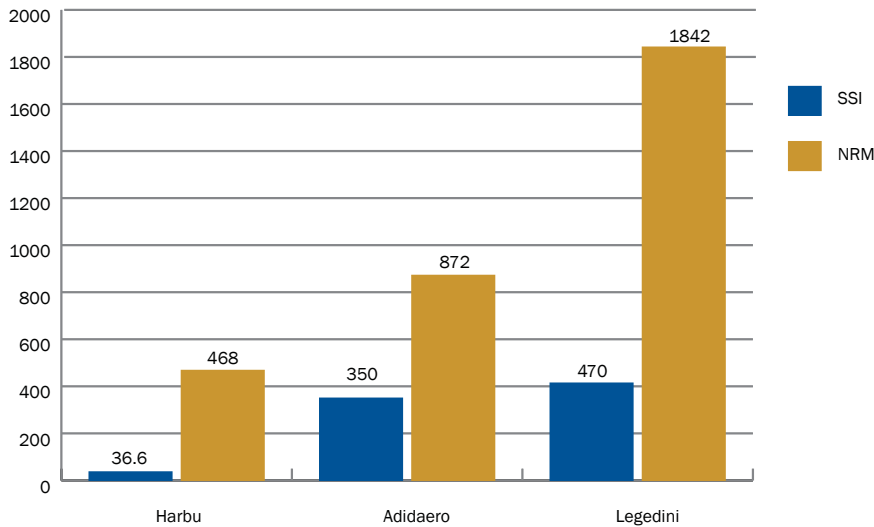


**Table 5.12: Cost and benefits of investments in irrigation and rain-fed agriculture for achieving higher levels of food security in Harbu, Adidaero and Legedini**

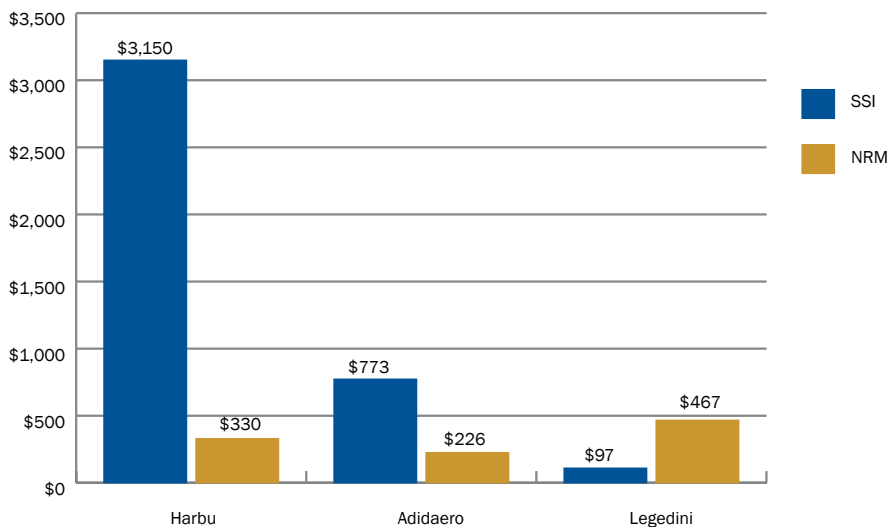
	COMPONENTS CONTRIBUTING TO FOOD SECURITY	NUMBER OF HOUSEHOLDS	AVERAGE MONTHS OF INCREASED FOOD AVAILABILITY FROM THE PROJECT *	US\$ AMOUNT INVESTED	% OF TOTAL PROJECT BUDGET	TOTAL ADDITIONAL MONTHS OF FOOD AVAILABILITY	US\$ COST OF EACH ADDITIONAL MONTH OF FOOD AVAILABILITY
<b>Harbu</b>	SSI	61	0.6	115,305	39.3	36.6	<b>\$3,150</b>
	NRM and Ag support	522	0.9	154,305	52.6	468	<b>\$330</b>
<b>Adidaero</b>	SSI	233	1.5	270,585	49.2	350	<b>\$773</b>
	NRM and Ag Support	1,090	0.8	197,689	39.9	872	<b>\$226</b>
<b>Legedini</b>	SSI	90	5	45,388	4.6	414	<b>\$110</b>
	NRM and Ag support	638	3	860,995	88.2	1,842	<b>\$467</b>

\*Reported by respondents to HH questionnaire

**Figure 5.9: Total additional months of food availability in the entire watershed project areas, reported by households in the three watersheds. (Additional cash income is not included as food availability.)**



**Figure 5.10: Cost for each additional month of food availability in the watersheds for NRM and SSI**





An Arborloo ecological toilet with a rock superstructure, Legedini. Rock is abundant in Legedini and this dry-stack rock superstructure is easily and quickly constructed. Paul Hebert for CRS.

“CRS has documented quite accurately the investment cost required for conventional latrines (\$47) and for arborloos and other ecological toilets (\$10).”

Two main conclusions can be drawn from this analysis:

1. NRM and Agricultural Support in the three watersheds create more months of food security for the watershed at lower cost per household than small scale irrigation. This is because, with the exception of Legedini, the irrigation systems had a high cost per household, and irrigation households reported relatively small gains in food availability, but large gains in income. Since irrigation households were a small percentage of intervention households, the food security gains overall were small.
2. In Adidaero and Legedini, it is clear that *small-scale irrigation provided more months of food availability per beneficiary household* than did NRM and agriculture support (Table 5.10). It also provided *more income per beneficiary household* than dry-land farming for Harbu and Adidaero as shown in Table 5.8 above. We could not explain why the irrigation farmers did not report higher months of food availability, since clearly their incomes allow most of them to be fully food secure. In fact, comparing their incomes with the cost to purchase enough food to meet basic needs, 85% of irrigation farming households should be able to meet their food needs for 12 months. We expect that they answered the question on food availability considering only their food availability from their own production, but this could not be confirmed. It is interesting that the result was consistent for both Harbu and Adidaero.

Small-scale irrigation can also provide other benefits in terms of cash for labor, a greater variety of fruits and vegetables available in the local market, and increases in marketing skills of irrigation households.

The challenge of SSI lies in the inequity of the distribution of benefits as planned and implemented in Adidaero and Harbu. While SSI is very beneficial to those who receive it, the overall impact on the watershed is minimal, as shown in Table 5.10 and in Figure 5.8, because so few households received these benefits. The table also suggests that small-scale irrigation is more worthwhile when the costs can be kept significantly lower, as is the case in Legedini, and when the number of beneficiaries can be significantly increased, as is the case in Adidaero. CRS needs to resolve this inequity and recommendations on how to do this are found in the recommendations section of the report.

Again referring to findings 1 and 2 above for the other components, we start with **Water Supply**. These costs were in accordance with experience for other gravity and shallow well systems built by CRS across Ethiopia (\$40-\$70 per HH). The fairly low costs (\$43) per HH in Adidaero may be the result of lower material costs, since rock is so plentiful, and possibly a larger number of households using the system than planned for. CRS can expect to pay on average \$50-\$60 per HH for such systems for future projects. The benefits from the water systems in Adidaero and Harbu were similar, with women and girls saving about one to two hours per household per day. In Legedini the time saving per household per day was between 4 and 6 hours, as the former water source was a river located quite far from the project site.

**Sanitation** costs varied from \$11- \$29 per HH, but it was difficult to obtain the exact amount that the projects invested and so estimates had to be made. The variation was due mainly to the fact that the project invested only in a fixed number of latrines, but the latrines spread with additional households constructing latrines at their own expense (mainly their own labor and make-shift slabs), so the actual investment costs does not included the costs incurred by HHs themselves. It is important to point out that CRS has documented quite accurately the investment cost required for conventional latrines (\$47) and for arborloos and other ecological toilets (\$10).

**Fuel-efficient stoves** were promoted in Legedini and Harbu. Project inputs in Harbu per stove were Birr 35 (\$4) with an estimated HH contribution of Birr 60 (\$6.75) for a total of Birr 95 (\$10.67). In Legedini, the project input was Birr 100 (\$11.23) and the household contributed Birr 150 (\$16.85) for a total of Birr 250 (\$28) for a more sophisticated stove. As these stoves spread to other households without further project cost inputs, the cost per household dropped to \$1.41 per household in Harbu and \$11 in Legedini. These stoves do vary significantly in cost depending on the design and whether or not local materials are used. The time savings for household women and children from collecting firewood was 1.5 hours per day in Harbu and 2.3 hours in Legedini. The 60 households with fuel-saving stoves interviewed reported that they used about 50% less wood. This suggests the important contribution that these stoves can make to saving forests.

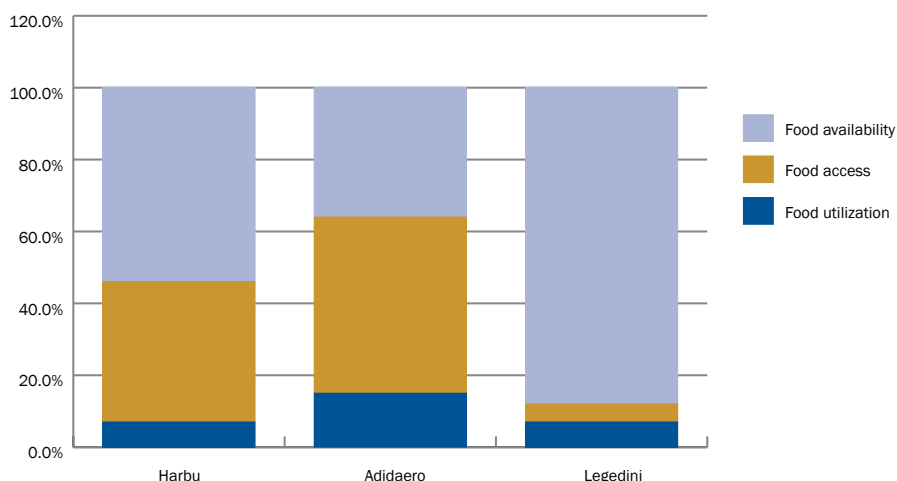
An accurate estimation of investment cost for **SILC** was difficult to make, and the large variation between what was reported in Adidaero and Legedini could be inaccurate. The larger number of participants in SILC in Adidaero could account for the fairly small cost per HH. The benefits were small in terms of income generated both in Adidaero and Legedini, but these SILC groups were relatively new.

The cost of **beekeeping** investment was nearly the same for Legedini and Adidaero at \$100 per HH. Data was not available for Harbu. Comparison of income generation through beekeeping and honey production in the three watersheds was available only in Adidaero.

Referring to major finding 5, CRS has promoted a number of smaller-investment interventions to improve food access and food utilization. These include SILC and beekeeping for food access, and water, sanitation, hygiene and health education, and fuel-efficient stoves for food utilization. These investments comprised only 7% (Harbu) to 15% (Adidaero) of costs but produced significant benefits for those households receiving them in terms of 1) times-savings for women and girls (water supply and fuel efficient stoves), 2) health (sanitation, water supply, fuel-efficient stoves, hygiene education), 3) income (SILC, beekeeping), 4) improving community cohesion, 5) raising the knowledge base of the community, and 6) improving the status of women.

Investments in interventions for food utilization alone (water, sanitation, health and hygiene and stoves) amount to less than 10% of the overall project costs. These investments are shown below in Figure 5.10 in relation to investments for the other two food security pillars. Some of these benefits are quantified and included in Tables 5.2 and 5.7 above.

**Figure 5.11: Distribution of IWM investments in food security pillars for the three watersheds**



Women in Harbu and Legedini who have fuel efficient stoves save on average 2 hours per day from collecting firewood, as they need to collect only half the usual amount. Stoves also make an important contribution to saving forests. Erin Preston for CRS.

In view of their relatively low costs and significant impacts, attempts should be made to maximize coverage of water supply, sanitation, hygiene education, and use of fuel-efficient stoves, with a target to cover the entire population of the watershed wherever technically feasible. Water supply might be the only intervention that could be constrained in achieving 100% coverage due to water availability and geography of the watershed.

One can easily calculate the potential time savings both from water supply and fuel-efficient stoves using data from this study as an estimate. For example in Legedini, where HHs report that they save from 4 to 6 hours a day in collecting water and 2.3 hours in collecting firewood, each HH benefiting from these interventions saves a total of 6.3 to 8.3 hours per day. If every household could benefit from just these two services, communities could be immeasurably transformed and women freed from much of their daily drudgery.

Likewise the promotion of sanitation for every household with support to construct arborloos or other ecological toilets would also have a major impact, not only on health, but on household food security by providing another source of food variety and/or cash from sale of produce. CRS and partners have done a commendable job in achieving higher levels of sanitation in Harbu (87%) and Adidaero (80%). Legedini coverage was much less (41%) but with such low-cost options available, further promotion and support could be accomplished.

SILC and beekeeping have shown to be investments with high potential reward (per HH income of \$226 in Adidaero for honey production at a moderate cost of \$100 per HHs). While it is clear that every HH cannot benefit, there is ample room to expand and scale up use of these two interventions, especially for the lowest income HHs in the watersheds.

#### **5.4 EVALUATION OF PROGRAM COMPONENTS USING OTHER CRITERIA**

**What is the strategic relevance, appropriateness, efficiency, effectiveness, equity, complementarities and scalability of project interventions on a component-by-component basis?**

##### **Key findings:**

**NRM and agriculture support:** The strategic relevance of NRM and agriculture support cannot be overemphasized for achieving food security and livelihood improvements. They are appropriate, efficient and effective, achieve equity, complement water supply and can be scaled further, even without outside support but with strong committee action. NRM (physical structures) and the agricultural support (mainly training and tools) complement one another and their impacts are maximized when considered together. Female-headed households and other households with few members and a lack of male labor were reported to have benefited less from harvesting grass and other products produced by NRM. Agro-enterprise development intended to complement physical and training inputs had made some inroads, but farmers still need further support to realize measurable benefits. The mixed results on introduction of new varieties of seeds suggest that further planning is required prior to introducing new varieties to insure their appropriateness in different settings. The effectiveness of introducing these new varieties in both Legedini and Adidaero is notable from increased yields and production and short maturation for key crops and suggests that these interventions should continue to be a part of CRS IWM projects. Similar effectiveness in using manure and compost to boost production in Legedini suggests further promotion of manure use in new IWM projects.

**Irrigation:** SSI is relevant and a high impact component of the program in terms of increasing HH incomes for those who participate. The study suggests that river-intake irrigation systems are expensive in relation to overall benefits to the watershed. Overall, irrigation benefits only

those farmers who have access; it does not produce much additional food security for the watershed, and while it is effective for those who can access it, it is an economical investment only for the small number of beneficiaries who realize income, and for the most part it has not been equitable. These issues may be overcome if CRS and partners take account of the three conditions noted above while planning and designing SSI schemes in the future.

**Water supply:** The strategic relevance of water supply, like NRM and agriculture support, is unquestionable. It is the foundation of good health and holds the power to reduce the workload of women. It is highly cost-efficient and effective in meeting objectives for improving life, and it complements sanitation and hygiene, but it is not easily scalable since it depends on having available water sources. Water supply should be provided to all of the watershed population where physically feasible, and where gravity systems or inexpensive wells can be developed.

**Sanitation:** The strategic relevance and appropriateness of toilets for IWM is that people need to be healthy in order to be productive. It is known that sanitation is one of the most important foundation stones of health, even though the direct health benefits are difficult to measure quantitatively. Based on the findings of the household surveys more than 80% of HHs have toilets in Harbu and Adidaero, and 40% in Legedini. A number of additional new toilets have been constructed since the projects phased out, further verifying their relevance and appropriateness. Government support through CHWs has provided the necessary complement to ensure this success. Ecological toilets can be even more strategically relevant, contributing to nutrition, reforestation, and income. This has not been fully realized in the watersheds evaluated. Their efficiency is high, especially for ecological toilets – which cost about 25% the cost of conventional latrines – if they are well maintained and used. This requires much support in hygiene education. Their effectiveness is high as reported by HHs in Harbu and Adidaero, but again requires maintenance and consistent use by all household members, which was found to be a weakness in Legedini. Toilets complement water supply, in keeping water sources uncontaminated. Arborloos have additional complementarities in 1) NRM in reforestation and soil fertility (tree-planting on Arborloo pits or use of compost on fields), 2) health in providing fruits in the diet as well as a clean environment, and 3) income from selling produce. As toilets are low-cost and can easily be constructed by households, they are equitable and spread easily, as shown by the projects evaluated. To achieve the benefits above and further scalability, sanitation requires much program support for education, motivation, demonstration and training of artisans.

**Health and hygiene education:** This component is also strategically relevant and absolutely necessary to ensure that households have the necessary knowledge to improve their health status through preventative means. For the same reason it is entirely appropriate and has involved communities in a participatory learning process. This component has been shown to be effective in transfer of knowledge by the high levels of knowledge retention confirmed in the household surveys. However, effectiveness in translating knowledge to practice related to household sanitation, reduction of harmful traditional practices and attitudes and prevention of HIV/AIDs varied among and within the communities survey and in some cases the evidence was discouraging. The component was efficient with negligible costs, and is an essential complement to sanitation and water supply investments. This component reached 75% of the watershed households in the three watersheds evaluated, can easily reach an entire watershed population and should be planned for with this target in mind. Consequently, it is both equitable and scalable.



*A protected spring in Harbu. This spring had leaches that infected and killed cattle. Now the water is safe for humans and livestock. Paul Hebert for CRS.*



*Beekeeping is a hidden gold mine within IWM projects, as it requires a modest investment to reap significant benefits. It provides a means to address landless and poor households, who might not have access to other income earning activities. Erin Preston for CRS.*

**SILC:** Two watersheds had active SILC groups, some well established and others quite new and just beginning to realize a record and experience in savings and lending. So far income is still quite small for HHs in most of the groups, but the potential is high. The groups are introducing savings discipline and there is room for growth. SILC is strategically relevant and appropriate to provide income opportunities to women, the landless and others who may not benefit as readily from other IWM inputs. So far in Legedini and Adidaero, SILC has not been effective in substantially increasing savings and producing additional income for members. SILC is still in its early development in both communities and should be closely monitored. It is efficient as the cost to the project is low in establishing SILC groups, but it does require continued involvement of CRS or partner staff to train and motivate SILC groups. SILC provides an excellent way to achieve equity in IWM projects by targeting HHs most in need of support as noted above. It is certainly scalable, and as demonstrated in Adidaero, it seems likely that the more SILC groups that can be organized the less will be CRS's investment cost per household. SILC complements agro-business development interventions, so members who use SILC loans should be linked to the agro-business development groups and project inputs to help with their business plans and actions.

**Beekeeping:** Beekeeping is a hidden gold mine within IWM projects, as it requires a modest investment to reap significant benefits for those HHs involved. It is strategically relevant as it complements NRM activities and provides a means to address landless and poor households, who might not have access to other income earning activities. It is therefore also highly appropriate within IWM projects. It has been effective in establishing start-up with new hives for individuals and cooperatives and efficient in that significant income is being produced with small investments by the project, especially in Adidaero. Beekeeping complements and is dependent upon the recovery of the natural environment from the work of NRM and from fruit trees and other vegetation established with irrigation. This component is scalable, but with limits on the actual number of households that could benefit within a defined watershed area. It provides another means to achieve equity through targeting of landless, youth, women and more destitute among the watershed households. It does require a degree of training and initial provision of modern beehives to help to achieve higher production over traditional hives.

**Fuel-Efficient Stoves:** Fuel efficient stoves have been promoted in Harbu and Legedini. However, in Adidaero the evaluation team did find numerous HHs who were using fuel-efficient stoves that they had constructed themselves. These stoves have been shown to be highly relevant and appropriate to the needs of households in Harbu and Legedini and are well accepted as contributing effectively to reducing the amount of firewood needed (by about 50%) and time needed to collect fuel wood (average of about 2 hours per day per HH). The stoves are relatively inexpensive and can be made from local materials as well. There is no reason that they cannot be targeted for all households in the watershed. They have reached 30% of HHs in Legedini and 48% of HHs in Harbu according to data collected from CRS and partners. Stoves complement NRM by saving on wood being removed from reforested areas and also reduce smoke in the house.

### **Integration of Project Components**

The idea behind the IWM program is that through integration of the different components, overall benefits will be enhanced more than through implementing one or two major components alone. The above discussion noted how some of the components complemented one another, but to what extent was there integration of interventions? As noted in Section 5.1, food security rests on three pillars, increased food availability, food access and food utilization. CRS has placed the majority of its emphasis on increased food availability

through NRM and agriculture interventions and on increasing food access through income generated by SSI and to a lesser extent through other income generation activities such as beekeeping. NRM/Ag and SSI represented more than 80-90% of all project costs in the three projects evaluated. While there has been a high degree of integration of agriculture support and NRM, and agriculture support and irrigation, the other major components (domestic water, sanitation, health education, use of fuel efficient stoves) have been implemented as add-ons. SILC and beekeeping have been closely associated with irrigation and NRM and therefore there has been a good degree of planning and integration for these components. The interventions that support food utilization run the risks of being under-valued and possibly underfunded unless they are critically analyzed in terms of their contributions towards overall project objectives. The example of the huge savings in time for women from water supply and use of fuel-efficient stoves, thereby allowing them to prepare meals and participate in other productive activities, is but one example of the value of this component in supporting increased food security. A more fully integrated program will be achieved only when each intervention is analyzed in terms of its overall contribution to food security and livelihoods.

## 5.5 MANAGEMENT STRUCTURES, AND PARTNERSHIPS

**How have community management structures, partnerships and strategies (household, community and project) contributed towards achieving benefits and program objectives?**

### **Key findings:**

- All of the structures, partnerships and strategies discussed below have contributed towards achieving benefits and program objectives, but some weaknesses that need to be strengthened are also discussed below.
- Community Management Committees varied in their strengths. Some were very strong (water supply, health and closure), some were weak (Harbu irrigation) and others had ceased to meet entirely (e.g. the Watershed Management Committee in Harbu). Strong committees exhibited strong communication with kebele and woreda offices, but success in collaboration was also very much dependent on the strengths of the offices and their staff. Most committees were managing communal lands and rationing water as needed.
- Government offices were equally variable in their support to communities, either due to lack of sufficient staff to meet community needs such as the repair of non-functional water systems, or lack of policy or strategy, such as in supplying new seed varieties.
- Some cooperatives were strong and growing stronger. They saw the benefits of their association and were re-investing some of their profits in capital improvements, such as beekeeping cooperatives investing in new hives and equipment at Adidaero. Even its own members considered the irrigation cooperative in Harbu to be weak, lacking in fee collection enforcement, organization of maintenance, and transparency in financial matters.
- The IWM program and projects have progressively aligned with changing government policy during the past 4 years. To some extent government policies have evolved to align with the actions of CRS related to IWM, and in some cases the government has used the CRS IWM projects as models for their own initiatives in watershed natural resource management, particularly related to area closure. Today CRS and the government work closely in partnership, promoting the goals of IWM.

## 5.6 FACTORS FOR SUSTAINABILITY

What are the factors necessary to ensure sustainability of the systems and structures put in place?

Factors necessary to ensure sustainability include:

- Strong community committees with some literacy and numeracy and with support for skill development prior to phase out.
- Adequate training of committee members for operation and maintenance of water systems including irrigation.
- Strong support from relevant government offices.
- Continued support from CRS implementing partners after phase-out for a period of time, perhaps two years, during which time these partners should have a small budget.
- Continued support of the PSCP for the most vulnerable households in the short term.

The sustainability of the integrated watershed management projects was assessed with an eye to whether the positive effects will continue after external support has concluded, including the capacity of local institutions and government offices to sustain the running of project components and the availability of systems to continue to provide project benefits. In addition, the sustainability of the project was assessed in relation to how well community members and project stakeholders were engaged in the project planning, implementation, monitoring and evaluation. It also assessed the adaptation of technology to make it appropriate for existing conditions, as well as assessing local institutional arrangements currently in place that favor sustaining the achievements realized.

It is clear from the evaluation that project strategies for sustaining benefits through multiple approaches and interventions are likely to succeed, at least in the medium term. Some of the strategies that were implemented by the project and that have been showing the intended results include the establishment of different community level structures that are responsible for the management and upkeep of the interventions, including WATSAN committees, NRM committees, irrigation water use committees and the enlistment of community health workers to transfer basic health message to the community at the village level. Though the NRM benefit sharing mechanism requires fine-tuning in Adidaero and Legedini, overall the locally designed benefit sharing mechanism with its clear by-laws governing all project participants has contributed to improving the cohesion of the household and will be a key factor in sustaining the benefits beyond the project's lifespan.

Other key strategies implemented by the projects have already shown some indication of achieving a degree of sustainability. These include strengthening local government structures through various capacity building activities including the provision of technical and managerial trainings, provision of technical support and provision of materials and instruments to kebele and woreda level institutions. During the evaluation it was found that most of the activities and technologies that had been introduced by the project were appropriate, and there were no reports that the technologies introduced did not fit with the local context.

Sustainably improving the food security of project participants requires long-term engagement, linked with government strategies and strategically complementing other initiatives in the target area in a holistic manner. It is through a multi-faceted targeted approach that the lives of people can be improved significantly in a sustainable manner. In this regard the project made significant efforts to prevent the depletion of assets from



*A girl in Harbu watershed carries water for her family. Paul Hebert for CRS.*



recurrent droughts through provision of minimum wage payments for construction activities; higher agricultural productivity (both crop and animal production) through improved technologies; improvements to health conditions in the community; provision of alternative livelihood options (both on-farm and off-farm); and improvements in markets through urban-rural linkages.

The major issue that was noted with regard to sustainability was the under-staffing of some of the government offices that are key supporters of the watershed committees. It was found that the current government structure created serious challenges in being able to provide communities with the support and services so key to sustaining project benefits. For instance, in Enderta woreda in Tigray only one water technician is assigned to provide technical support for 239 water points, which means that it is unlikely that this person will provide the level of support needed on time to the community in Adidaero. This issue has already caused a number of water points to malfunction for extended periods of time. Thus, the sustainability of the water points is directly linked to the local government service provider structures that need to take into consideration the extent and level of support required by the community. Developing alternatives to government support will be necessary in some cases, and CRS and its partners should look at promoting and supporting local private sector initiatives for maintenance of water supply and other systems, providing slabs for toilets, fuel-efficient stoves, and other materials necessary for continued operation of IWM components.

## 5.7 LESSONS LEARNED FOR IHD

### **What are the lessons from the projects that can help increase the effectiveness of future projects in promoting Integral Human Development?**

Since 2005 CRS Ethiopia has been designing and implementing projects using its IHD framework, including using this framework as a means of assessing the contribution of projects in making positive impacts on households. The IHD Framework is used to evaluate these impacts in terms the following six IHD components:

- (1) Creation of household and community assets, including physical, financial, social, spiritual and human, and political assets.
- (2) Resilience to shocks, cycles and trends,
- (3) The role of community and government structures and systems created or utilized within IWM projects,
- (4) Strategies adopted by households and individuals to effectively utilize assets created.
- (5) Measurable development outcomes
- (6) Feedback, opportunities and constraints

The following lessons learned are probably not new to CRS staff and partners who work closely with the communities they serve. Overall, CRS and partners have done a great job of building assets, developing stronger systems and structures and reducing risks from shocks, cycles and trends.

#### **Lessons on creating more assets**

##### **1. Physical assets**

Some physical assets of the community as a whole and of individual households increased notably as a result of these IWM projects, and the benefits were fairly equitably distributed. These include 1) all the NRM structures and their products, such as soil and water retention,



*Project sign in Legedini. Paul Hebert for CRS.*

**“Strong support from government offices, and some support from CRS implementing partners for perhaps two years after phase-out, is important for long-term sustainability of projects.”**



A community tree nursery is an important physical asset for the entire community for continuing natural resource management activities. Paul Hebert for CRS.

“Approximately 1 million trees were planted in 3 watersheds.”

grass and wood products and nurseries; 2) the agriculture and productivity improvements and to some extent the domestic water supplies and sanitation; 3) irrigation infrastructures, beehives and bee equipment, seeds and seedlings; and 4) road infrastructure.

- **Lesson learned 1:** The physical assets of irrigation and its outputs were very inequitable, flowing to only 11 to 20 percent of watershed households. *Future irrigation projects must find a way to share the benefits of irrigation with a much larger percentage of watershed households.* The Legedini project provides a more positive model of how this might be carried out. On the positive side, non-land owners were able to benefit through land-sharing arrangements. In any case, in addition to trying to increase the share of irrigation benefits, *the project should create packages of other interventions that will equal the irrigation benefits and target those households that have no access to irrigation.* Solar energy sources in pump irrigation are one option to increase its sustainability.
- **Lesson learned 2:** Although the production and distribution of grass from enclosed hillsides benefited 60-75% of households in all watersheds, the variation in the mechanisms for cut and carry favored larger households with more male labor. Female-headed households, those with more elderly or with fewer members, collected and utilized less grass. On the positive side, non-land owners were able to benefit through land-sharing arrangements. *CRS and partners need to work with the communities in ensuring more equitable arrangements for grass cut-and-carry, sustainability of the NRM structures and creation of off-farm income earning activities for the landless.*
- **Lesson learned 3:** *Two inexpensive physical assets that make a huge difference in people's lives are latrines and fuel-efficient stoves. These two assets should have a target of 100% in every future watershed project.* For communities that will accept ecological toilet designs, promotion and education on how to use toilet compost, an important asset for growing fruit and other trees or for field fertilizer, should be a priority.
- **Lesson learned 4:** Manure and crop compost represent other important assets for soil conditioning and as a fertilizer, but in areas with little available wood, manure is also used as cooking fuel in the household. *CRS and partners need to pursue development of composts and use of other organic products to replace manure as soil fertility resources where manure must be used as a fuel.* Fuel-efficient stoves can help to achieve this outcome. *At the same time CRS should also pursue alternative fuels for cooking and household use in these areas.*
- **Lesson learned 5:** Access to seeds, tree seedlings and livestock are important asset-builders for households that need and want them. The projects have done a good job in trying to increase access through livelihood fairs and tree nurseries. *These activities should be continued and expanded.*
- **Lesson learned 6:** A physical asset not given much importance in these watershed projects is the backyard garden, though responses from the HH survey noted that these gardens were established by 20%-57% of HHs in the three watersheds. Table 5.5 above suggests that these gardens contributed to improved diets in both variety and quantity. CRS should undertake further analysis from the evaluation dataset. *Backyard gardens should be increased in future projects with a clear strategy for bringing them to scale.*

## 2. Financial assets

The project activities that built financial assets, in order of importance, were 1) irrigation, 2) agriculture, 3) NRM, and to a much lesser extent 4) SILC and beekeeping.

- **Lesson learned 1:** *In value for money, investments in agriculture produced more overall food security for watersheds than irrigation. This is because irrigation is expensive and serves a small proportion of farmers (11%-20% in watersheds evaluated) even when sharecropping is included because of the limited command area that can be irrigated. Irrigation produced significantly higher incomes for users compared to those relying on only rain-fed farming, creating a significant disparity in income between the better off and those not so fortunate to own land in the command area.*
- **Lesson learned 2:** *NRM and SSI have provided some opportunity for the landless and the poorest households to increase their income through sharing arrangements, but greater effort to specifically target such households will be needed in the future.*
- **Lesson learned 3:** *SILC is highly appreciated by participant groups, but projects have not done enough to roll out SILC to scale in the watersheds. Much more needs to be done to expand SILC to scale and work on adequate liquidation time or even whether they should be liquidated.*
- **Lesson learned 4:** *Beekeeping shows promise of becoming a high-level income-generating activity for more households, with continued training of beekeepers and more efficient cooperatives for marketing the honey. Beekeeping should be retained and expanded with priority given to the poorest households. Beekeeping will only be successful if the use of pesticides and herbicides is carefully controlled, monitored and coordinated with agricultural activities.*
- **Lesson learned 5:** *Inequity in building individual financial assets needs to be addressed by future projects. To help achieve equity in building financial assets, it would be best to ensure that every watershed household can benefit from at least one income-generating activity, two or more if possible, with priority attention given to women-headed households, landless and the poorest of the poor. Where every household cannot be covered, priority should be given to female-headed and landless households.*

### 3. Social assets

The participation of the majority of community members in some aspect of planning, design and implementation of project interventions has encouraged watershed communities to work together, to establish management structures and to deal with the day-to-day running of systems through committees, creating good opportunity for social interaction. Community members overwhelmingly recognize this as a positive influence.

- **Lesson learned:** *A lack of equity in the benefits of some interventions has created some tension and conflict, and these situations need to be openly addressed by CRS and partners along with the community to find equitable solutions. An example is the Adidaero mechanism for grass sharing, which discriminated against households without labor or with few adult male members and created tension.*

### 4. Spiritual assets

The projects have created a greater sense of well-being and a reason for hope for a better future. Overall project beneficiaries feel their lives and livelihoods have improved, but very little information on spiritual assets was obtained through the tools used in this evaluation or in CRS monitoring and reporting systems.

- **Lesson learned:** *CRS and partners need to find better ways to capture spiritual assets that have increased as a result of projects, not through questionnaires, but through other*



*With the assistance of the project, a SILC group in Legedini has formed a women's cooperative for marketing eggs and milk which provides significant income. Erin Preston for CRS.*

**“Inequity in building individual financial assets needs to be addressed by future projects. It would be best to ensure that every watershed household can benefit from at least one income-generating activity, ... with priority attention given to women-headed households, landless and the poorest of the poor.”**

types of highly participatory group discussions where people can express their ideas through flow diagrams, community dramas or other means. These activities would build community solidarity and a sense of the importance of sustaining their achievements.

## 5. Human assets

The IWM project increased 1) knowledge among the population on a variety of topics (NRM, agriculture and irrigation techniques, health behaviors, SILC, beekeeping); 2) cooperation and management skills; 3) self-confidence and self-efficacy; and 4) the number of children in school and ability to pay school fees. In their own words, “the illiterate have become enlightened.”

- ***Lesson learned 1:*** Given that the great majority of the beneficiaries of these projects are illiterate or have very limited formal education, *all of this new knowledge and new skills are highly appreciated.*
- ***Lesson learned 2:*** Project beneficiaries are still struggling with management, especially financial management and transparency in finances, largely due to low levels of education. *Future projects need to spend even more time in training for management, especially financial management.* SILC financial principles could help strengthen financial management.
- ***Lesson learned 3:*** *Time-saving for women from having to collect water and fuel wood is highly significant, ranging on average from 2 to 7.5 hours per day, depending upon the watershed.* This frees their time for other important activities, including serving on committees, generating income, caring for their children and households, and preparing and serving meals on time. Time-saving reduces tension in the household from lack of time to do daily chores well. Future projects should focus on how women could use these time-savings in terms of adult education and increasing options for income generation.
- ***Lesson learned 4:*** The HH survey suggests that time-saving has resulted in increased school attendance by girls, reducing their absences from school, and providing more time for study. This was poorly quantified in the study and *needs more attention in future M&E to capture these benefits, especially for girls.* The HH survey also indicated that increased household income was used for boys' and girls' education. *This too should be better monitored and documented in future projects as part of M&E.*

Several project components contribute, or should contribute over time, to improved human health. These include 1) water supply and sanitation, 2) health and hygiene education, 3) fuel-efficient stoves that reduce indoor air pollution, and 4) reduced time and distance to water points and less firewood to be collected, resulting in improved physical condition of women and less skeletal damage.

Improved health is an essential component of development and food security. Good health underlies all ability to make changes in one's life and enable productivity. It saves money at the household level, relieves worry, and creates a positive attitude toward life and change. The health components in these IWM projects are preventive health measures and thus help to transfer responsibility for health from government agencies and other outside bodies to the community.

- ***Lesson learned 1:*** The health-producing components of these IWM projects were, by and large, the least expensive interventions, taking up less than 10% of project budgets. *Health-related sub-components should never be cut or reduced from IWM projects, as*



Increased school attendance by all children, but especially that of girls, is an important human asset gained from the project. Erin Preston for CRS.

was done in Legedini in 2005 when the project was converted to support the PSNP.

- Lesson learned 2: By the fact that the project trained CHWs and that the level of coverage for health and sanitation was so high, one can only conclude that without government-paid community health workers or community health volunteers the achievements in health-related components and their sustainability would have been far weaker. *This message should be given to government at all levels, both as positive feedback and to lobby for continued support in this area.*
- Lesson learned 3: The way budgets were designed, consultants were unable to determine costs for health and hygiene education, but we assume these budgets were subsumed under water and sanitation, which were themselves small portions of the budget. *In the future it would be helpful to have each sub-component related to health broken down in the budget.*

## 6. Political assets

Political assets were strengthened between the communities and government as a result of these IWM projects. Linkages were strongest for those components where the government itself has developed strong policies and strategies, such as for health and area closures. The strong community committees formed under the project have placed the community at a level where they can cooperate better with government, having increased status and more overall political clout as evidenced by the cooperation and support achieved by many of the committees.

- **Lesson learned:** Where community committees were weaker or less active, or where government offices were weaker or lacked relevant policies and strategies, linkages and cooperation were weaker. Both community committees and government offices need to be strong for political assets to be realized. Therefore, *CRS and partners need to continue the emphasis on strengthening both community committees and government offices and facilitating linkages between the two.*

## Lessons on strengthening resilience to shocks, cycles and trends

Drought is the major type of shock that usually threatens any gains made in improving food security in Ethiopian rural communities. Since 2004 there have not been any major widespread droughts of the type that devastated the country in 1984-85 and 2002-2003.

- **Lesson learned:** In all three watersheds, NRM interventions in the way of soil and water conservation, including establishing hillside closures, tree planting and physical structures, provided a degree of protection against future rain shortage. It has raised water tables and allowed new water sources to be tapped. The details of these results are presented in the watershed reports. CRS should continue to exploit this success and the complementary closure and other NRM policies with government to work in partnership with them. *The use of PSNP to support NRM work is an extremely important short-term partnership to foster to ensure this work is able to continue during and after IWM projects.*

Use of new seeds and crop diversification may protect against drought, but these have not been used much in some of the watersheds. In Harbu, not enough attention was paid to traditional seeds and their advantages over new varieties, or improved seeds that support livestock and crop integration (i.e., sorghum stalks that provide a good source of animal feed).

- **Lesson learned 1:** Research into the advantages of traditional crops should be

**“By the fact that the project trained CHWs and that the level of coverage for health and sanitation was so high, one can only conclude that without government-paid community health workers or community health volunteers the achievements in health-related components and their sustainability would have been far weaker.”**



A Harbu Community Health Worker, trained by the project, next to a latrine she helped promote. Paul Hebert for CRS.

undertaken before assuming new varieties will be better and/or more suitable to the beneficiary farmers. CRS should review its extension approach for future projects, including participatory research with farmers.

- ***Lesson learned 2:*** Socio-economic contexts, including market and food habit preferences and integration of crop and livestock relationships, should be considered in crop variety introduction. Livestock get supplementary feed from crop production in all of the watersheds.

#### **Lessons on structures, systems and strategies**

- Lesson learned: Support of the government, especially for NRM, irrigation, domestic water and other systems, is essential for sustainability, and sustainability is essential for reducing risks of drought.

#### **Lessons on strengthening individual and household strategies for utilizing new assets**

The HH survey revealed that by and large most of the newly acquired assets were used to satisfy basic household needs in terms of food, housing, and purchase of livestock. Investment in the education of children was significant but ranked lower than the three strategies described above. Only irrigation farmers, whose income assets were double those of non-irrigation farming HHs in the watersheds, employed a wider range of strategies in using their newly acquired assets. These are described in the three watershed evaluation reports.

- ***Lesson learned 1:*** Households remain severely constrained in utilizing their assets for more than meeting basic household requirements due mainly to their poverty and precarious food security situation. This was most apparent in Legedini, where incomes were the lowest and months of food availability were also the lowest. *SILC has the potential for helping very low-income households to save the meager new earnings and create a small additional income from them. Without SILC this would probably not happen at all. Cooperatives also helped to organize groups to be better organized in their marketing and to earn more.* The linkage between marketing of local products and SILC was innovative. In the case of Legedini, the construction of feeder roads made it possible for groups and cooperatives to reach the market in Dire Dawa. *Consequently, feeder roads in watershed communities are necessary to open up markets in order for HHs to utilize their assets and to build more assets.*
- ***Lesson learned 2:*** HHs cannot always know what strategies to use without family members being better educated. Much more could be done to get watershed members into school. *CRS can do more to collaborate with others, including government and partners who are involved more directly in education development, who could be invited into CRS IWM projects at an appropriate time.* They could pick up on the asset of time savings for women and girls and help to direct the use of this time towards both education for girls and adult education for women. In general, the community should be capacitated in business planning and undertaking.

#### **Lessons on feedback, opportunities, constraints**

- ***Lesson learned on constraints:*** **Constraints** to project success include illiteracy among adult beneficiaries and weak government support in some watersheds. Also constraining are a poor recognition of farmer risk avoidance strategies, particularly in adoption of new varieties (some farmers are still not using improved seeds); lack of market information access; and limited water sources and difficult topography to expand irrigable and non-irrigable farmland

- **Lesson learned on opportunity:** There is the **opportunity** to invest IWM development funds slightly differently and achieve even greater impacts for the same resources. For example, irrigation is expensive, serves few people and takes large portions of IWM budgets. Unless the irrigation system can be made less expensive, more equitable and useful to the poorest households, those funds would be better spent on other components. There are other opportunities mentioned in the individual watershed reports. For example, there are new crop technologies and a willingness of farmers to try these. Experience in SILC can be used to increase transparency in the operation of community-led management committees. Feeder road construction is essential for creating market access and providing opportunities that otherwise would not be available.
- **Lesson learned on feedback:** Timely **feedback** from community, government, and household surveys, as well as other monitoring information, is essential to creating better IWM projects. *Having good, measurable, clear project objectives stated in terms of people rather than soil, trees, land, farming practices or health improvements, with clear household targets for each component and activity, clearly defined expected outcomes, measurable indicators, and budgets that have line items by component and activity would go a long way towards making monitoring and evaluation an easy process and provide the necessary feedback to improve implementation.*



Harbu landless man with his harvested grass for sale and feed for his livestock. Tsegahun Tessema for CRS.

## 6. Summary of Conclusions on Successes and Challenges

### 6.1 PROGRAM AND PROJECT SUCCESSES IN THE THREE WATERSHEDS

The following are a list of major successes observed for the three project watersheds evaluated. Discussion of these is included in the previous sections of this report and in the individual watershed reports (Part II).

- 1270 hectares in 3 watersheds conserved and enclosed.
- Approximately 1 million trees planted in 3 watersheds.
- Approximately 70-80% of HHs benefited from grass cut-and-carry in enclosures.
- Food availability increased 1 to 3 months per household per year.
- Productivity of main crops increased through improved agricultural practices, use of manure and composts and in some cases use of new seed varieties.
- Domestic water increased coverage from 0% to 40-80%.
- Time saved from collecting water by women is 1 to 4.5 hours per day per household.
- Ground water tables appear to be rising.
- Sanitation coverage increased from 0% to 40-87%.
- Fuel-saving cooking stoves (30-50% coverage) use half the amount of wood of conventional three stone fires, and save 1 to 1.5 hours per day per household in collecting fuel wood by women and girls.
- Small-scale irrigation schemes serve 11% of HHs in two watersheds and 20% in the third, and provide 2-3 times the overall annual household income of non-irrigation farmers.
- Modern bee-keeping techniques provided to 5% HHs: average income \$226 in Adidaero, with good potential for high income in all three watersheds.
- 5 SILC groups formed: average earnings \$17, again with high potential for expansion.

**“Approximately 70-80% of households benefited from grass cut-and-carry in enclosures.”**

“Among the challenges for IWM projects, “The overuse of water points has led to reduced water available and maintenance problems that require innovative solutions.”



Long line of jerry cans in Adidaero waiting for a water point to open. Water points in Adidaero are stressed due more people taking water than the points were designed for. Paul Hebert for CRS.

- Health and hygiene education: 80% coverage. Knowledge high.
- Many strong community management committees formed, in many cases with strong linkages to government woreda offices.
- Women's status increased: serving on committees, time savings, and in decision making at household and community levels.
- Project reached female-headed households in the 3 projects with major interventions and increased food security in line with male-headed households.
- Project components remain operational in watersheds where CRS has phased out in most cases, indicating that so far systems are being sustained.

Overall, projects have been successful.

## 6.2 CHALLENGES FOR IWM PROJECTS

Some major challenges observed from the evaluation are listed below and are discussed in more detail in the previous sections of this report and in the individual watershed reports. Some are also addressed in the recommendations section that follows this section.

- Long-term maintenance of NRM needs continued management and support to ensure continued viability and production of benefits to the watershed.
- Overuse of water points has led to reduced water available and maintenance problems that require innovative solutions.
- Problems in adoption of new seed varieties require more participatory methods with farmers.
- A value chain approach in agro-enterprise support has been lacking and could provide a needed boost in impact for such future support by CRS.
- Toilets have caught on, but community sanitation overall remains poor.
- Small-scale irrigation has thus far been inequitable and expensive for two of the three watersheds.
- Some conflicts related to irrigation and multiple-use systems exist and have not been dealt with effectively.
- Some inequity exists related to benefit sharing for poor and labor deficient households in grass harvesting from enclosures.
- SILC groups are too few and can be expanded with strong CRS and partner support.
- Health behaviors and HTP situations are not improving, despite good knowledge transfer.
- Some weak community committees.
- Weak relations with government in some cases and weak government offices in other cases requires further support to ensure government support in watershed interventions once projects phase out.
- Agricultural production still low, despite improvements.
- Lack of a comprehensive strategy for mainstreaming gender in each project component.



## 7. RECOMMENDATIONS

### 7.1 RECOMMENDATIONS FOR FUTURE CRS IWRM PROJECTS

**1. CRS and partners should continue with their current overall approach for improving food security and livelihoods using the IWM model, with continued emphasis on NRM and agricultural support, both shown to be the foundation stones for successful projects. However, future projects need targeting to select watersheds with the least food security and within those watersheds to focus on reaching the least food secure.**

The evaluation shows that the current strategy for improving food security and quality of life is successful and can be enhanced through better targeting and a better strategy to achieve more equity in benefits.

The evaluation found that the biggest gains in food security occurred in Legedini (a gain of 3 months of food availability on average), which was the poorest of the watersheds and the least food secure before the project (averaging only 4 months of food availability). Also, the least food-secure households (less than 6 months of food availability) reported the biggest gains in food availability from project interventions. This was found also for the other two watersheds, where the biggest gains appeared to take place among HHs that started with the fewest months of food availability. This recommendation may have implications for the way CRS currently selects watersheds and HHs within watersheds for different interventions. There is also much room for support to further increase productivity on farmlands, which would add to increasing food availability.

This recommendation also has implications for CRS's "theory of change" for increasing watershed food security. The food security framework used by CRS provides a guide to improving food security with its three elements of food availability, food access and food utilization. CRS interventions contribute to each element. CRS proposals currently do not give a rationale for targeting that would achieve maximum impact in each element of the framework. For example, the proposals do not say they will target the least food secure for SSI or for NRM, which would most likely achieve the greatest degree of improvement in food security for the watershed, as found in this evaluation. The three watershed proposals reviewed for this evaluation did not provide a rationale for any of the targets given. CRS should consider writing a new "theory of change" document that clearly explains not only how components contribute to each pillar of food security, but also how their gender strategy and their equity strategy also contribute. In addition, the new theory of change should show how those households in need would be targeted with interventions aimed at each pillar.

A starting point to achieve better equity would be to establish the average investment per household by dividing the overall budget by the total number of targeted households in the project area, and to design interventions so that households receive no more than this average without good justification. To ensure that the poorest households are included in relevant project interventions, baseline data on wealth of households within the community needs to be collected for each project before decisions on targeting are made. This should greatly aid CRS and the partner in making decisions on targeting in consultation with the watershed community.

**2. CRS Ethiopia needs to produce better project proposals, budgeting and reporting to allow for easier monitoring and evaluation of results, costs and benefits for different components.**

The three project proposals and budgets for the watershed projects evaluated were insufficient in detail, had little to no information on household targets, provided some objectives that were not possible to measure (i.e. “prevalence of waterborne diseases on children will be reduced by 35%,” “soil loss on hillsides and private croplands will be reduced by 65% and 50% respectively in the watershed.”), and had almost no budgeting by component or objective (except Legedini, but even here costs were not broken down into sub-components such as SILC, stoves, beekeeping, latrines, health and hygiene education). This made the evaluation very difficult to carry out, given the evaluation questions that CRS asked us to answer.

*Project pro-frames (stating objectives, intermediate results, outputs or impacts and indicators) and budgets and financial reporting should be designed with monitoring and evaluation in mind. If the M&E are to be by project component/intervention as is recommended, then indicators specific to each component/intervention need to be explicit and budget lines need to specify components/interventions. For each component, explicitly stating the number of households targeted for the intervention, with a map of the intervention area, is essential for evaluating the effectiveness, efficiency and equity of the project component. CRS needs to establish a central database system for archiving and accessing relevant project information to assure an institutional memory.*

Consequently, having good, measurable, clear project objectives stated in terms of people rather than soil, trees, land, farming practices or health improvements, with clear household targets for each component and activity, clearly defined expected outcomes, measurable indicators, and budgets that have line items by component and activity would go a long way toward making monitoring and evaluation an easy process.

Indicators that were useful for this evaluation by component and that could be adopted by CRS for future use are:

- NRM
  - % of project budget
  - % of watershed households benefited
  - Observed impacts on watershed environment
  - Income from and direct use of products for households considering different types of benefits (firewood, charcoal, grass, etc.)
  - % of female-headed households participating/adopting/ benefiting from the practices/techniques
- Agriculture & Agro-enterprise
  - % of project budget (if not included with NRM)
  - % of farmer households covered by new varieties of seeds, training, compost use and other key inputs (segregated by irrigation and dry-land farmers) and the rates of adoption of these techniques/practices
  - % of female-headed, landless and other poor households participating/ adopting/ benefiting from the practices/techniques

- Increase in crop production and yields
- Months of food availability before and at end of project per household, including animal products
- Amount of food aid or cash or food for work given per household from beginning to end of project
- Household income from crops and animal products
- Livestock ownership and production
- **Beekeeping**
  - % of project budget
  - % of watershed households covered
  - % of women-headed, landless and other poor households participating
  - Household income from intervention
  - Knowledge of beekeeping and capacity to teach others
- **SILC**
  - % of project budget
  - % of watershed covered
  - % of female-headed, landless and other poor households participating/ adopting/ benefiting from the practices/techniques
  - Amount of annual income increase earned per SILC member
  - Uses of SILC loans and payback rate
- **SSI**
  - % of project budget
  - % of watershed households benefited
  - % of female-headed households, landless participating/adopting/ benefiting from the practices/techniques
  - Benefit-sharing with non-land-owners (share-cropping, renting)
  - Income to households from irrigated land
  - Increase in variety of food for household use
- **Sanitation and hygiene education**
  - % of project budget
  - % of watershed households with toilets
  - % with ecological toilets and use of compost (planting fruit trees or garden/field use)
  - Knowledge of hand-washing at key times
  - % of respondents who can name 3 ways to prevent diarrhea

- Presence of a hand-washing station and soap in the household
- % of children under 5 who have had diarrhea in the last two weeks
- Knowledge of other important household hygiene practices such as separation of animals, refuse pits, compound cleanliness
- Health education
  - % of project budget
  - % of watershed households that received health education
  - % of respondents who can name 3 ways HIV infection can be prevented
  - % of respondents who will eat with an HIV infected person
  - % of respondents who approve of various HTPs, including female circumcision
  - % of respondents who know 2 key ways to prevent malaria infection
- Fuel-efficient stoves
  - % of project budget
  - % of watershed covered
  - Time savings for women from collecting fuel wood
  - Use of time savings
  - Amount of wood saved by the new stove
  - % of stoves vented outside the house
  - Knowledge of stove construction and ability to teach others

Budget lines required by components listed above are:

- % of staff time (salary and benefits) spent on component
- % of transport expenses on component
- Equipment and supplies for component
- Cost of labor paid by project and volunteer by component
- Training costs by component
- Reasonable allocation of administrative and overhead costs over all components

There are other indicators that would be useful that were not included in the evaluation, such as education (enrollment, dropouts, and skipping lessons, for both boys and girls).

It would be useful to organize these indicators according to the different levels in the pro-frame: indicators at the goal level, SO, IR, and outputs levels. There was not time to accomplish this in the evaluation report, but this could help in designing future projects.

**3. CRS and partners should initiate new projects with multi-disciplinary teams representing the three food security pillars. Teams should ideally be composed of experts in Agriculture/NRM, multiple uses of water, health, SILC and other IGAs, and a gender specialist, as well as an M&E specialist.**

All team members should be represented from the inception of a project and should

undertake the field assessment together. This should result in solving many of the issues and challenges raised by this evaluation. M&E team members should play a strong role throughout the life of the IWM project and conduct periodic reviews of progress toward achieving objectives.

#### **4. SSI deserves special critical attention in future proposals to ensure greater coverage, efficiency and equity.**

Small-scale irrigation has provided large benefits to irrigation farmers in the way of income and production. The costs per household (>\$1,000) and as a percent of overall project budget (approximately 40-50%) were very high in two watersheds and quite reasonable in a third. In all three watersheds SSI reached a very small proportion of the population (11-20%), which raises serious issues related to equity of benefits. The experience in Legedini suggests that greater efficiency for SSI may be obtained through building multiple-use systems, increasing the productivity of the irrigation land through more intensive farming systems, and using boreholes or other technologies that can reduce system costs. Planning for sharing SSI benefits with landless, female-headed and poorest households (as was well done in Legedini), and where possible subdividing land into smaller plots with more users (as in Adidaero) would result in much greater equity. Finally, establishing a value chain approach in agro-business support for irrigation farmers would help to improve marketing of products.

Specifically, CRS and partners should consider investment in SSI when it meets the following conditions in order to achieve efficiency, equity and coverage within the watershed:

- **Reasonable cost.**

- Cost per hectare not to exceed industry standard.
- Benefits exceed costs (meaning the estimated benefits to farmers must exceed the investment and operational costs over the life of the project)<sup>5</sup>.
- Reasonable cost per household. For purposes of equity, it is suggested that SSI investment costs should not exceed average cost per household for overall project investment: for example if the overall project budget is US\$ 1,000,000 and the targeted beneficiary HHs is 2,000, then the average investment per HH is \$500. Therefore, the average investment per irrigation beneficiary HH should in principle not exceed \$500. An exception could be if the irrigation households were the poorest of the poor, then this might warrant a deviation from this rule of 10-20% above the average. CRS should consider alternative irrigation systems, technologies and strategies to lower costs where possible.
- Reasonable allocation as a percent of overall project budget in terms of the food security framework and in terms of equity. First, we want to ensure that the other pillars of food security – food availability (NRM and Agricultural support) and food utilization (WatSan, health, etc.) – are given proper weight in allocation of the budget. In addition, a reasonable allocation of budget could mean ensuring that the percentage of budget allocation for any component should not exceed a similar proportion of HHs receiving the benefit from that component in the watershed. For instance, if SSI is 25% of the budget, it should attempt to serve not less than 25% of the project HHs.



Harbu farmer tending his irrigated onion field.  
Tsegahun Tessema for CRS.

**“Small-scale irrigation has provided large benefits to irrigation farmers in the way of income and production, doubling and tripling their income compared to others. A challenge for CRS is to achieve greater equity of benefits to all households in future watershed projects.”**

<sup>5</sup> The Cost/Benefit analysis methodology is explained in the Adidaero Watershed Report



Households with land benefited more from the project than landless and female-headed households. Paul Hebert for CRS.

**“Poorest households (landless, female-headed and other poor) require a larger package of income-producing interventions than wealthier households.”**

- Targeting the most food insecure to benefit.
- Expanded coverage or equitable sharing of benefits among watershed HHs (direct or indirect). For instance, first CRS and partners should attempt to expand the coverage of HHs with SSI as much as possible (through sub-division of plots, share-cropping, use of labor or any other local arrangement), and for those who do not benefit from irrigation, CRS and the partner should ensure that those households receive other income generating interventions to compensate.

CRS and partners need to go through the process systematically and consider the above factors before deciding on investment in small-scale irrigation. This process could commence with a review of the newly proposed and newly started IWM Projects. A similar process should also be used to consider investment in other components.

**5. Poorest households (landless, female-headed and other poor) require a larger package of income-producing interventions than wealthier households.**

Poorest households need to be specially targeted for a household package of activities that can produce income. These could include beekeeping, provision of small ruminants, backyard gardens, arborloos, grass cut-and-carry, harvesting of wood products, SILC and handicrafts. As many interventions as possible should be promoted within one household.

SILC is a highly valuable component much appreciated by beneficiaries who took part. A very tiny proportion of households participated in SILC in these evaluated watersheds. A strategy for spreading SILC to more people more quickly is under development by CRS and should be applied to current and future projects as soon as it is ready.

**6. Certain relatively inexpensive project components and activities contribute greatly to better food security and livelihoods and therefore should aim to reach every household in every project.** These are:

- Arborloos or other toilets
- Fuel-efficient stoves
- Health and hygiene education
- Agriculture training and agro-enterprise
- Access to enclosures for cut-and-carry forest products
- Water supply

Some of the above might be achieved at low cost by training local change agents, artisans, and members of the private sector, and by having a strategy for the spread of new ideas and technologies so that when the project exits this new knowledge is a self-sustaining part of the culture.

**7. Future IWM projects and trained community health workers need to utilize the new CRS tools for discussion and training on HIV/AIDS (We Stop AIDS and In Charge!) and other participatory methods to help translate knowledge on health and harmful traditional practices into positive action and behavioral change.**

The evaluation revealed a lack of application of knowledge on how to prevent various diseases and to address HTPs, along with a high level of stigma toward HIV positive persons and the continuation of cultural practices that can spread HIV infection. There existed in all three projects a lack of methodology for helping people to learn and to apply health and hygiene

messages and to confront cultural norms that are harmful to health. CRS now has stronger methodology and tools for health and hygiene education that they need to begin to apply. CRS will need to increase its training on these tools for partners and CHWs.

**8. CRS needs to have a clear strategy to help ensure that gains in food security by NRM and agricultural project inputs are sustained and enhanced, even after the departure of CRS and partners from the watershed. Future IWM projects should plan better for sustainability from the beginning and begin preparing a phase-out strategy and systems at least two years before the end of projects.**

The evaluation shows that there are still shortfalls in food security in the three watersheds, despite 3 years of intervention in Harbu and about 7 years in both Legedini and Adidaero. In Harbu the average shortfall is 2.7 months, in Adidaero it is 2.8 months, and in Legedini it is 4.9 months. The question is: with the current IWM strategy, have we achieved as much as we can? Can more achievements be expected in the future without further inputs?

The evaluation revealed that production continues to be low (in terms of agricultural standards), mainly due to poor soil fertility and condition even with adequate rainfall. We still conclude that the NRM and agricultural components have been effective in raising food security, but there is room for continued improvement in soil fertility and productivity. What would be the keys to improving soil fertility? 1) sustained NRM activities and possible expansion; 2) sustained vigorous application of compost and manure; 3) sustained strong community management committees for NRM; and 4) sustained strong government support for NRM and agricultural techniques, new seed varieties and seedlings. These actions should gradually, over several years, improve soil fertility and increase productivity and food availability. The project has laid a good foundation. However, lack of attention to these four imperatives will result in no increase in food availability and possibly a deterioration of the gains made, as warned in this team's Harbu IWM evaluation report.

However, the gap may never close entirely without HH access to increased income. Therefore the second measure to narrow the gap in food security would be stronger emphasis upon farm and non-farm income-generating activities, particularly targeting the households with the largest gaps in food security.

The evaluation team concludes that the CRS strategy for sustainability of key community committees and their relationships with relevant government offices needs to be stronger. Major gaps noted were community committees that no longer meet; community committees that have no transparency in their financial records or dealings; community committees that still lack basic skills in math, record keeping and finance; and weaknesses in government offices themselves.

Before exiting projects, CRS needs to be more attentive to the strength of the community committees and the government offices and their ability to carry on actions that would lead to maintenance and enhancement of food security. This would involve assessing the capacities of community committees and relevant government offices to continue operating and supporting the interventions. If such committees and offices are still weak, CRS should not exit until they are strengthened.

Where gaps or weaknesses are found two years before project closure, CRS should develop a two-year strategy for strengthening the capacity of these committees and offices so that at phase-out, all structures and systems will be in place and will sustain achievements. CRS should also assess sustainability factors every two years after project completion for a period of 6 years and ensure there is follow-up refresher training by the government, CRS or other partners as needed.



*Traditional pond improved by the project, now used only for watering animals. Sustaining such improvements over time requires a clear strategy. Tsegahun Tessema for CRS.*



*None of the watershed projects provided clean water for 100% of the people. This girl in Harbu watershed still has to obtain her water from a poor polluted source. The evaluation recommends going back to the project watersheds and achieving full coverage of water supply and sanitation. Paul Hebert for CRS.*

**9. If possible, CRS should go back to the 3 watersheds in this evaluation (Harbu, Adidaero and Legedini) and carry out the recommendations for strengthening and completing the work (see list of recommendations per watershed).**

This will ensure greater sustainability of achievements than leaving weaknesses and missing pieces unattended. It will also show the watershed populations CRS's appreciation for their participation in the evaluation. For example, CRS should aim to complete 100% coverage of sanitation and fuel-efficient stoves, which would be fast and easy to achieve. There are, of course, other areas that could be addressed as noted in the specific watershed recommendations below.

**10. CRS and partners should identify gaps and weaknesses in on-going and other completed IWM projects not included in this evaluation and make recommendations for filling those identified gaps.**

These three evaluations showed a great many strengths and benefits, but also some unfinished business. What other gaps and weaknesses exist in the watershed projects that were not part of this evaluation, and what would it cost to go back and strengthen them? Wouldn't it be worth the cost to ensure that achievements in all watershed projects are sustainable? In that way CRS and its partners can leave a legacy of implementing high quality IWM projects from which government and other NGOs can learn. This would require designing some follow-on projects and presenting these for funding, as well as discussing with government or other partners the means to address recommendations.

**7.2 RECOMMENDATIONS FOR HARBU, ADIDAERO, AND LEGEDINI**

**Harbu**

- Construct one or more new water points where feasible due to the rising water table.
- Revive and strengthen all community committees established under the project, including irrigation committee, WatSan committees and NRM committees and help them to establish by-laws and improve financial and physical management.
- Work with the irrigation group to explore ways to share the benefits of irrigation with more households.
- Improve irrigation water management system.
- Address the 40% of the population who did not feel that they benefited from the project. Explore beekeeping, backyard gardens and SILC as ways to bring them more benefits.
- Strengthen all watsan committees, as necessary.
- Give training to CHWs and community leaders on the arborloo and Fossa Alternata toilets to ensure that toilet compost products are being safely reused on fields, and to reach 100% toilet coverage. Thus, this would be a refresher on sanitation.
- Give refresher training to CHWs and community leaders on environmental sanitation in general, including separation of animals in the household living space, collection of animal dung and other household hygiene practices.
- Create a solution to open defecation at the hot springs. This presents an opportunity for a little income generation by building nice toilets and hand-washing facilities and asking a minimal usage fee to pay for a caretaker.
- Create a strategy to expand the use of fuel-efficient stoves.



- To reduce HIV stigma and to promote prevention, give training to community groups on *We Stop AIDS*. For school children, use *In Charge!*.
- To reduce harmful traditional practices, especially female circumcision, CRS should create a multi-faceted program that includes at minimum the application of the learning module *We Have Healthy Children*, community conversations around HTPs, and the establishment of community by-laws.

## **Adidero**

### Recommendations for NRM

- Off-farm income generating activities should be directed towards the landless and the poor, as most of the natural resources benefit, directly or indirectly, the landowners through their farmland. In addition, landless households are much less likely to have oxen to benefit from the seasonal and selective grazing system that are enforced by the community.
- Locally specific by-laws and benefit-sharing mechanisms are more effective than the centralized and generic by-laws. However, communities need to be encouraged to consider equitable means of benefit sharing by taking into the account the special needs of households lacking in labor and oxen.
- Communities should not rely on external support to sustainably guard natural resources from vandalism and theft. Communities need to be encouraged to be self-sufficient in the management and control of their natural resources.

### Recommendations for SSI

- Build the business skills of the vegetable and fruit producers and link them to the market in Mekele.
- Conduct research on vegetable and fruit agronomy, pest and disease management and enable the farmers to use the research findings.
- Establish a regular irrigation system maintenance program.
- Make an adequate irrigable land use plan and define crop mix so that the farmers benefit from a synchronized crop mix and make use of price advantages. This also helps them manage the risk entailed in specialization.
- Ensure a vegetable seed supply system and enable farmers to produce seedlings.

### Recommendations for rain-fed agriculture

- Further research needs to be conducted to improve compost-making with ash and its impacts on the fertility of the land.
- Alternative energy sources and energy saving technologies must be considered to reduce the use of cow dung for cooking and make it available for soil fertility improvement.
- An improved seed-supply mechanism from the research institutions should be put in place to enhance production and productivity.

### Recommendations for agro-business

- There is a need for further support to the community in strengthening agro-business activities and translating them into knowledge and action for better marketing of products in the watershed HHs.



*A community-managed hand pump in Adidaero is chained to prevent overuse, as there are still not enough water points for the population. The pump was open two hours each morning and afternoon. Paul Hebert for CRS.*

- SILC, which capitalizes on indigenous support systems such as Iquib and Idir, helps to ensure sustainability of the approach. It is advised to enhance the scale of SILC to empower women.
- Linking SILC with business activities and building business skills and market linkages should continue and should be strengthened.
- The notion of fixing the initial life of SILC diminishes its vision. In the future, developing SILC into a viable rural financial institution and linking it to microfinance institutions might be considered as a way of scaling up.
- For the beekeeping cooperatives to be sustainable, it is necessary to enforce by-laws and increase transparency and accountability. As the number of modern beehives increase and honey production increases, the project should put more emphasis on creating honey marketing cooperatives, which should result in increasing market linkage and increasing farmer bargaining power.
- Scale up the beekeeping intervention and integrate it with NRM to ensure adequate bee forage supply.

#### Recommendations for water supply

- CRS should investigate whether the community members trained in maintenance have enough skill to do the repairs that have been needed recently, and if additional training is necessary this should be undertaken. CRS and the partners should assess the current status of the water points that were not functioning at the time of the evaluation.
- The major concern in water supply activities is the serviceability of the system in the longer term. Improving access to water and sanitation services in the project area requires significant new investment and a new way of conceptualizing and addressing the problems, including addressing the issue related to multiple use of water, which is the centerpiece for the sustainability of the water supply system.
- When an irrigation system is designed for multiple use, CRS and partners should ensure that there is representation by all types of users on committees that manage these multiple use system.
- Understanding the limitation of the technologies and providing the appropriate information and advice to the communities will help to sustain the benefits of water systems.
- In order to minimize the loss of water due to evaporation, shade for ponds should be included during the design and construction of such structures.
- Water fees should be based on the amount of water collected rather than blanket water rationing with a fixed monthly water fee. This will provide additional income for the repair and maintenance and the system will provide the water based on the demand and needs of the household. This ultimately could improve daily water consumption per capita.
- The government needs to improve its service-provision capacity, especially support for the maintenance and upkeep of water supply systems. The new government structure needs to be flexible and to recruit additional skilled personnel to those service-provision sectors.

- Thus, to ensure the sustainability of the water supply activity, one should 1) enhance the processes of shared decision-making between the primary stakeholders at all stages of the project cycle; 2) promote a demand-responsive water supply system rather than water rationing through a flat rate payment; 3) encourage the consumers and local community to finance, over the long-term, the operation and maintenance costs of the water and sanitation services; and 4) as an alternative, encourage the private sector to provide repair and maintenance services of the water supply system (where the community pays for the service).

#### Recommendations for sanitation and hygiene

- Schools were not reached for hygiene and sanitation promotion, and this was a missed opportunity. Future projects should include schools for promoting sanitation and hygiene behavioral change.
- Sanitation and hygiene remain problem areas. Knowledge is good but practice is poor. CRS and partners need to strengthen their behavior change methodology.

#### **Legedini**

- Explore with women how they would like to productively use their time savings from collecting water and firewood. Set up a program to address their priorities. This might mean adult literacy education or classes on nutrition, child rearing, home gardening or other subjects, more SILC groups, income generation activities, etc. For girls, it might mean helping other girls to get into school.
- Give training to CHWs and community leaders on the arborloo and Fossa Alterna toilets to reach 100% toilet coverage.
- Work with watsan and irrigation committees to strengthen financial management and transparency. The pump irrigation system can evolve into business schemes by applying SILC principles.
- Give training to the pump operators on how the pump works and what maintenance is needed.
- Give training to CHWs and community leaders on environmental sanitation in general and teach them how to make refuse pits and how to collect animal dung. If dung is not to be used as fertilizer for fields, then it can be collected in animal-waste arborloo pits and used to grow fruit trees.
- Give training to CHWs and community leaders on basic home hygiene for the prevention of diarrheal and other diseases. Train CHWs in some of the PHAST learning activities, give them toolkits of drawings, and encourage them to go to groups of households (about 24 household representatives to a group) and do the learning activities.
- Expand the use of fuel-efficient stoves. Create a strategy for their expansion.
- To reduce HIV stigma and to promote prevention, give training to community groups on *We Stop AIDS*. For school children, use *In Charge!*.
- Strengthen community training on NRM and expand area closure. Planting trees of economic and ecological value is necessary.
- Capitalize on the existing NRM systems of the community and build the capacity of the local system to enhance sustainability.



*A farmer in Legedini was able to harvest a crop during the drought of 2009 due to the transformed environment and good farming practices as a result of the CRS watershed project. Erin Preston for CRS.*

- Introduction of modern beekeeping requires a pesticide-free zone. Thus, common understanding between the beekeeping and the crop protection promoters is needed to ensure the sustainability of beekeeping.
- Strengthen the irrigation groups and their management practices, including strengthening of marketing and market links.
- Sustainable improved seeds supply system should be put in place.
- Manure utilization efficiency should be enhanced.

# ANNEXES

## ANNEX 1: CHARACTERISTICS OF THE WATERSHEDS

PROJECT TITLE	REGION	ZONE	WOREDA	KEBELE	STARTING DATE	ENDING DATE	COMPONENTS	IMPLEMENTATION AGENCY	NUMBER OF BENEFICIARIES. (HHS)	TOTAL EXPENDED US\$*
Harbu Integrated Watershed Management Project	Amhara	South Wollo	Kallu	Addis Mender	Dec. 2001	Sept. 2004	<ol style="list-style-type: none"> <li>1. Natural Resource Management</li> <li>2. Agricultural Support</li> <li>3. Multiple Uses of Water</li> <li>4. Sanitation and hygiene education</li> <li>5. Health Education and Disease Prevention</li> <li>6. Cross-cutting: gender and partnership arrangements</li> </ol>	Water Action	570	
Adidaero Integrated Watershed Management Project (Phase I & II)	Tigray	Southern Zone	Enderta S/Samre H/Wajerat	Maigenet Chelkod W/Adikeala Dejen	July 2002	Sept. 2008	<ol style="list-style-type: none"> <li>Agro-enterprise Development</li> <li>1. Natural Resource Management</li> <li>2. Multiple Uses of Water</li> <li>3. Sanitation and hygiene education</li> <li>4. Health Education and Disease Prevention</li> <li>5. SILC</li> <li>6. Cross-cutting: gender and partnership arrangements</li> </ol>	ECC-SDCOA Mekelle Branch	1,172	
Legedini Watershed	Dire Dawa Adm. Council	-	-	Legedini	2003	Dec. 2007	<ol style="list-style-type: none"> <li>Agro-enterprise Development</li> <li>1. Natural Resource Management</li> <li>2. Multiple Uses of Water</li> <li>3. Sanitation and hygiene education</li> <li>4. Health Education and Disease Prevention</li> <li>5. SILC</li> <li>6. Cross-cutting: gender and partnership arrangements</li> </ol>	ECC-SDCOH	840	

At completion of all phases: US\$ conversion 9.8 ETB/US\$

## ANNEX 2: HOUSEHOLD SAMPLING

The sample size required for a given survey is determined by its measurement objectives and sampling strategy. When the survey is designed to measure either changes in indicators over time or differences in indicators between project and control areas, the required sample size depends on five factors. The first two are population characteristics and the last three are chosen by the evaluator or survey designer. These are:<sup>6</sup>

1. the number of measurement units in the target population,
2. the initial or baseline level of the indicator,
3. the magnitude of change or comparison group differences expected to be reliably measured,
4. the degree of confidence with which it is desired to be certain that an observed change or comparison group difference of the magnitude specified above would not have occurred by chance (the level of statistical significance), and
5. the degree of confidence with which it is desired to be certain that an actual change or difference of the magnitude specified above will be detected (statistical power).

The first step in determining the sample size consists in selecting a variable (an indicator) on which to base the sample size calculations and ultimately against which to measure the final goal of the program. Ideally, the requirements for each indicator would be considered in determining sample size needed for any given survey. However this would be very cumbersome. This problem is usually addressed in one of two ways. One option is to determine which of the indicators is likely to be the most demanding in terms of sample size and use the sample size required for that indicator. In doing so, the requirements of all other indicators will be satisfied. The second approach would be to identify a small number of indicators that are felt to be the most important for program evaluation purposes and limit sample size computations to these. This will ensure an adequate sample size for key indicators.

In this evaluation, the most important variable to measure is the adoption rate of different project activities by the beneficiaries. Most of the progress indicators, especially in Harbu and Adidaero, are related to adoption rate of different activities and stated as either improving or reducing the stated indicators by nearly 25%. This figure is the difference between the baseline value, if it is known, and the target that was set to be achieved by the project. In other words, the project would like to see changes by 25% due to its intervention. Thus, this figure is used as a change that the project would like to achieve for the majority of the indicators as stated in the project document and taken as a basis for determining the sampling size, using the following basic sample determining formula.

$n = D [(Z\alpha + Z\beta)^2 * (P1(1 - P1) + P2(1 - P2)) / (P2 - P1)^2]$  , where

n = required minimum sample size per survey round i.e. for each watershed;

D = design effect (assumed in this case to be the default value of 2 – for two stage sampling, as this sampling strategy involves two stratum – clusters or villages and household);

P1 = the estimated level of an indicator measured as a proportion at the time of the first survey or baseline value (for this survey we could use P1 = 0.5, as we do not know exactly the baseline value for all of the indicators, this is the safest number recommended to take as a baseline value)<sup>7</sup>;

P2 = the expected level of the indicator either at some future date or for the project area such that the quantity (P2 - P1) is the size of the magnitude of change it is desired to be able to detect, in this cases the magnitude of change is 25% or 0.25;

Z $\alpha$  = the z-score corresponding to the degree of confidence with which it is desired to be able to conclude that an observed change of size (P2 - P1) would not have occurred by chance ( $\alpha$  - the level of statistical significance), and for 95 percent of degree of confidence the value of Z $\alpha$  will be 1.645; and Z $\beta$  = the z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size (P2 - P1) if one actually occurred ( $\beta$  - statistical power), for the 95 percent of degree of confidence the value of Z $\beta$  will be 1.645.

<sup>6</sup> Food and Nutrition Assistance (FNNTA), sampling guide, 1997

<sup>7</sup> The reason for setting the value of P1 or the baseline value to 0.50 is that the variance of indicators that are measured as proportions reach their maximum as they approach .50. The safest course would be to always choose P1=.5, as this will ensure an adequate sample size irrespective of what the actual value of P1

Using standard parameters of degree of accuracy (95% confidence) and based on the above premises and parameters, the initial sample size calculations suggested that an obtained sample size of 152 households per watershed would give sufficient power to meet the study objectives. In order to make up for losses to the sample as a result of households without eligible HH member, refusals to participate, or incomplete interviews, the initial number of households to be visited was raised by approximately 5% of the calculated sample size. Thus the total sample size per enumeration area will be 160.

In order to provide equal probability of selection of households in large and small villages in each watershed, the consultants employed a probability-proportional-to-size (PPS) cluster sampling strategy. For the purpose of this study, clusters represent villages (which means *gote* in Amharic) whereby a group of households are living together in the same area and are sharing common values and resources such as grazing land, water points and social institutions. All villages (clusters) in the watershed were included to ensure even livelihood distribution (geographic area) of enumeration sites, except in the case of Adidaero where the villages were selected based on project components, as they were many to cover.

PPS was used to select male-headed and female-headed households separately in each of the selected villages. The total sample size in each watershed was divided among the villages proportional to the number of households. The ultimate sample units, i.e. households, were randomly selected at the village level by enumerators and supervisors.

Attempts were made to ensure gender representation. As much as possible, 50% of the sample respondents were females who were accompanied by their husbands, if married, to answer questions pertinent to males. Equally, wives accompanied their husbands in order to respond to issues pertinent to women. The female-headed households were included in the sample based on their proportion in the household population. In total 480 households were interviewed in the three watersheds of which 31%, 28% and 14% were female headed in Harbu, Adidaero and Legedini watersheds respectively.





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