EXTERNAL REVIEW AND IMPACT ASSESSMENT OF THE AFRICAN HIGHLANDS INITIATIVE (AHI)

Program Evaluation Report

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Executive Summary

It is widely acknowledged that INRM is a means of achieving the CGIAR's multiple goals of food security, poverty alleviation, and protection of the natural environment. The CGIAR has defined INRM as "a way of doing development-oriented research to simultaneously tackle poverty, ensure food security and environmental protection." These elements of human well-being are best addressed by enhancing the well-being of the ecosystem in which people live and work. In INRM approaches, problems are identified in a participatory manner, involving farmers and policy makers from the start. Inter-disciplinary research on alternative solutions then follows, using the actions identified in the first step. Since agro-ecosystems are driven by the interactions of ecological, economic, and social variables, INRM research has to work back and forth across all three dimensions.

The prevailing serious degradation of the natural resource base in the intensively cultivated and overpopulated highlands of Eastern and Central Africa resulted from poor land management systems associated with traditional farming practices, on the one hand, and the concerted effort to improve agricultural productivity through intensification and diversification, on the other. This has been exacerbated by the fact that the majority of poor small-scale farmers have not adopted many of the improved agricultural technologies and practices aimed at mitigating some of these problems. Cognizance of this concern led to the formulation of AHI both as an eco-regional program of the CGIAR and a regional program of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). AHI was initiated in 1995 as a consortium of national and international agricultural research and development organizations.

AHI's core role as an innovator is to develop novel methods and approaches for participatory INRM through testing in pilot sites, cross-site synthesis, and regional dissemination and institutionalization. AHI's targeted beneficiaries and partners in this work include national and international research organizations and networks, development organizations, local governments, civil society organizations, service providers, policy makers, community-based organizations, and male and female farmers.

AHI has implemented its activities at benchmark sites in Eastern and Central African countries (e.g., Ethiopia, Tanzania, and Uganda). A multi-disciplinary and multi-institutional team of researchers and development workers, located at each benchmark site, works with farmers in a participatory mode. A regional research team based at AHI's regional headquarters in Kampala, Uganda, supports the site teams. Technical and methodological support is also provided by regional research fellows (RRFs) based in the collaborating countries or at AHI headquarters. A regional coordinator provides technical and administrative support. AHI uses capacity building as an instrument to enhance the competence of scientists and associated partners.

AHI uses an approach in developing and managing its research/development programs that allows a large number of stakeholders to have an active role in identifying and prioritizing research themes. The use of multi-disciplinary and multi-institutional research teams at benchmark sites in each participating country enhances testing relevant social and technological systems/approaches to solve problems related to agricultural productivity and environment management.

Documentation and data on outcomes and impacts at the sites are important in planning strategically the future research and investment in Eastern Africa region. Frequent evaluation and feedback help the program to improve planning, implementation, and monitoring activities, which contributes to effectiveness in achieving set goals and objectives. Against this background, AHI and its host institutions, with financial support from the International Development Research Centre (IDRC), requested an external review and impact assessment (ERIA) to review program progress and assess AHI's performance in the region. Although AHI's evolution has occurred in several phases and has required modifying its contextual framework, this review concentrates on phase III and IV, though it draws upon the external evaluations of previous phases.

The objectives of the ERIA are as follows:

1. Assess the extent to which the program is meeting its objectives and aims, as set out in its directives, and identify any evolution in program objectives;
2. Document and assess program results (i.e., outputs, outcomes, and impacts at the household, landscape, district, and institutional levels);
3. Offer reflections on the strengths and weaknesses of the program's thematic approach and strategies in relation to the current thinking and practice;
4. Assess the composition and functioning of the program team as it relates to its ability to meet program objectives;
5. Make recommendations on how AHI could adapt in light of the current situation and anticipate changes within the field of INRM research.

To carry out the assignment within the brief time allotted and provide feedback to AHI and its stakeholders, donor, and host institutions, the ERIA team:

1. Performed a desktop review of all documentation (from the website, briefs, working papers, journal publications, and other relevant reports made available by AHI);
2. Carried out household surveys in four sites (Lushoto in Tanzania, Kapchorwa in Uganda, and Areka and Ginchi in Ethiopia), conducted more than 400 household interviews, performed data analyses focusing on impacts on households, communities, and local institutions, and generated both quantitative and qualitative information; households for the survey were drawn from three categories:"participating" households in the watershed, "other residents" in the watershed who are expected to benefit from spillovers and "control" group from outside the project area for counterfactual comparisons
3. Conducted focus group discussions on landscape issues with farmer groups;
4. Interviewed stakeholders at the institutional level to record AHI outputs and assess AHI outcomes and, in some instances, impacts on partner institutions;
5. Reviewed four field reports by consultants and a synthesis of the results of the household surveys and focus group discussions.

Review Findings

Phases I and II paved the way for achieving impacts on farmers' livelihoods and the environment through improved crop varieties and other innovations. In phases III and IV, the goals and objectives became more complex and challenging. AHI started making progress on promoting institutionalization of NRM approaches, despite its relatively lower capacity to influence the pace of institutional change in most institutions. Progress on declared objectives is generally good for current phase IV. AHI has undergone an adaptive learning process while responding to change, usually taking into account the views of different stakeholders at

various levels. Yet the distinct phases show a shift in focus, in part due in response to changes in the working context and to a lesser extent, to changes in leadership.

In phase IV institutionalization of the INRM approach was developed further. Although AHI's mode of working "locally" while synthesizing and influencing "regionally" brought about good progress in developing the integrated watershed approach. More time is needed to fully institutionalize the INRM approach at all levels, given the need for "mind-set" change and to integrate a more diverse group of stakeholders to scientists, managers, policy-makers, and institutions. Research has shifted to promote self-led institutional change, farmer institutional development, and landscape governance.

Continuous, long-term funding by the donors during the 14 years since AHI's inception, also as a result of AHI's track of successful work, also allowed establishing and sustaining a system for monitoring achievements on development pathways and impacts in the program.

Household survey results showed that positive impacts were observed in all sites in terms of improved crop productivity and increased income (mostly from agriculture). In all sites, greater impacts were observed in the participant group, followed by the other residents or "spillover" group, and finally, the control group. Different levels of spillover effects were observed in the different sites. Similar patterns were observed in terms of outcomes, such as collectively solving NRM issues, compliance with bylaws, and widespread testing and adapting of new technologies.

The main factors that facilitated the process include frequent training and visits, the particular participatory methods, involvement of village leaders; attention to gender aspects, provision of testing/demonstration materials (such as seed) and responding to community needs, involvement of farmers in meetings and workshops, farmer exchange visits, and radio and TV messages. Even more adoption and impact could have been achieved (and in the future can be achieved) if AHI had facilitated more dissemination, promotional strategies and /mechanisms of knowledge management such as field days, radio and TV programs, etc.

AHI has strong and effective implementation modalities through participatory action research, recognized by both farmers and stakeholders. This is related to AHI's capacity to address, from the bottom-up, the main entry points raised by farmers. AHI methods developed and adaptations of approaches to the local context have enabled stakeholders to understand the complex nature of INRM and improve the learning process, leading to greater adoption of the approach. The strengths of the program are related to its strong commitment to NRM; informal capacity building of partner institutions and scientists; advocacy for change in research approaches; influencing other actors (e.g. the Sub Saharan Africa Challenge Program (SSA CP); consolidation of system components and their relationships; and the ability to influence communities using social science and participatory tools.

Clear impacts were observed by the ERIA at the participant household level and outcomes at the level of local institutions in the sites (especially in terms of adopting the approach and changing attitudes towards research, principally at the grass root level and, in some cases, institutions; and in terms of understanding and adopting natural resource management) as well as local spillovers to non-participants. AHI has been successful in building capacity of stakeholders in different areas (e.g. farmers more readily recognize and solve NRM issues,

communities solve conflicts in participatory ways, empowered farmer institutions such as the farmers research groups (FRGs); this has often been driven by the needs expressed by local stakeholders, end users, farmers, and institutions. There is awareness and appreciation of watershed management, in particular, and INRM, in general, among many high level officials, leaders of institutions, and policy makers.

As a result of good interaction between AHI's biophysical and socio-economic components, and a community driven approach, AHI was able to deliver actual results through INRM. This is a rare achievement within the CGIAR. The process was also facilitated by long-term investments by AHI donors and commitment of the host institution, both necessary for developing and testing long-term complex innovations.

The institutionalization of the INRM approach is taking place, though at different speeds and with different degrees of effectiveness across sites and countries, depending on specific local challenges. This has been supported by successful facilitation of local level networks at the watershed level and the engagement of different types of stakeholders through training and dissemination methods.

The process of disseminating AHI outputs and methods is fairly effective at the international level, especially through its rich web site (www.africanhighlands.org). Training in methods at the local and regional levels was often mentioned as an example of successful AHI activity. AHI's other achievements have been acting as a 'think tank' for developing tools and methods, and for institutionalizing INRM at the regional level. AHI contributed to the conceptual design and development of the SSA Challenge Program now in progress in three pilot learning sites in west, eastern and central and southern Africa. Additionally, AHI has provided technical backstopping in the selection of these sites, in the development of tools for baseline data, participatory monitoring framework and strategies for establishment of innovation platforms. AHI has also shared its experience, knowledge, and products with other CGIAR centers.

Looking at other areas of improvement, the participatory way of working with farmers through action research, while allowing AHI to address in several instances from the bottom-up, the main entry points raised by farmers, risks overstretching AHI's activities and its capacity for addressing NRM issues. In general, program activities and work themes seem not to have very well defined boundaries and at times appear to lack focus. Effective prioritization mechanisms, often already in place to some extent, are needed.

The dissemination and publicity of AHI's work and approach are satisfactory at the international level but appear to be limited at the national and local levels, hence limiting AHI's national visibility.

Recommendations

The ERIA arrived at some recommendations for consideration by AHI and its stakeholders:

Building on its most specialized and recognized strengths, i.e., the capacity to foster and catalyze partnerships, to conduct participatory research effectively in order to identify and promote INRM technologies that meet the needs of local users, and to facilitate actions by key local players.

Investing more in local scientists and organizations as a way to ensure the sustainability of the process it promotes, and to be able to build successful strategies and modalities for future "disengagement" and out-scaling strategies with its partners.

Strengthening and seeking institutional partnerships to influence policy adjustments and linkages to enhance INRM in collaboration with the Ministries of Agriculture and Environment, and local governments. The success of AHI and the up / out scaling of its methods and approaches depend on collaboration with different partners. When its partners face difficulties or restructuring, AHI's work is affected. AHI should consider and be prepared to face partners' changes, and that other players also get on board.

Reviewing the criteria to be used when deciding which new areas of work to tackle (or not), and the process to guide its choices through a systematic and participatory process at different stakeholder levels.

Assisting and backstopping NARS to conduct more adaptive and validation type research to supplement the research on methods that AHI is already heavily engaged in. Some stakeholders indicated that the supply of NRM technologies is still limited and hence needs continued attention.

Developing a (short) list of "flagship products" as public goods to focus, communicate its areas of work and what it aims to deliver. Having a "road map" and an impact path way that The ERIA provides AHI with material and evidence to further discuss and develop in participatory ways its key flagship products.

Improving and expanding its dissemination and publicity efforts at the national and local levels using modern dissemination technologies; and building on its own good experiences (e.g. the Telecenters).

Improving the internal information flows from its leaders to its grassroots members, and vice versa. The overall framework of the various approaches and interventions at different scales should be publicized more, and clarified to new and external viewers and stakeholders.

Attempting to broaden its donor base, AHI should devote efforts to broadening local-level (national, district) sources of funding to ensure the sustainability of the program. Improved timeliness of sourcing of funds from donors and release of funds to its field activities is very critical to achieve its goals.

AHI has had tangible impact on the livelihoods of participants and, in some cases, of other farmers in the sites, as well as several positive outcomes on farmers and partner institutions. Yet impacts are mainly local, and the outcomes for partners, in particular at national levels, now need to be strengthened and expanded. It would be timely for AHI to facilitate the up / out-scaling of its methods and approaches by building on partnerships in subsequent phases.

As perceived by the ERIA as well as by various stakeholders, AHI should keep researching on methods, but the balance may need to change; in the next phase it may need to focus more on INRM options and out/up-scaling its approaches to increase impact. We also recommend exploring new research areas, e.g. on how to build effective and sustainable "exit" and out scaling strategies in the current sites and start expanding to new sites and opportunity areas.

Given its eco-regional mandate, experience, unique achievements, and key strengths, AHI might develop into a center of excellence of INRM. We recommend building a “hub style” regional coordination and management structure, cost effective and technical, to play such an important role.

Finally, the ERIA suggests to AHI a possible trajectory to be followed during the next 3-10 years, for consideration and reflection. As AHI’s main comparative advantage lies in its implementation of “INRM that works”, the evolution of the program is towards a center of excellence on INRM, that other centers—in the CGIAR and outside it—international organizations, NGOs, and national institutes can refer to in order to successfully initiate and implement INRM approaches.

List of Acronyms

AGILE	African Grassroots Initiative for Livelihoods and Environment
AHI	African Highland Initiative
ASARECA	Association to Strengthen Agricultural Research in East and Central Africa
ASDP	Agricultural Sector Development Program
BRP	Business Reengineering Program
CBO	Community Based Organizations
CD	Committee of Directors
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
DALDO	District Agricultural and Livestock Development Officer, Tanzania
DC	District Commissioner
DED	District Development Director, Tanzania
ECA	East and Central Africa
ECAPAPA	East and Central African Programme for Agricultural Policy Analysis
EIAR	Ethiopian Institute of Agricultural Research
ERIA	External Review Impact Assessment
FGD	Focus Group Discussion
FRG	Farmers Research Group
HARC	Holetta Agricultural Research Center
HH	Household
IAR4D	Integrated Agriculture Research for Development
ICRAF	World Agroforestry Center
IDRC	International Development Research Center
INRM	Integrated Natural Resource Management
ITAU	Impact Targeting and Assessment Unit
KADLACC	Kapchorwa District LandCare Chapter, Uganda
NAADS	National Agricultural Advisory Services, Uganda
NARO	National Agricultural Research Organization, Uganda
NARI	National Agricultural Research Institute
NGOs	Non-Governmental Organizations
NPPs	Networks, Programmes and Projects
PADEP	Participatory Agricultural Development and Empowerment Project
PM&E	Participatory Monitoring and Evaluation
PMS	Performance Management System
PR	Participatory Research
PRA	Participatory Rural Appraisal
RRF	Regional Research Fellows
RRT	Regional Research Team
RSC	Regional Steering Committee
SACCO	Saving and Cooperative Society
SARI	Selian Agriculture Research Institute, Tanzania
SDC	Swiss Agency for Development and Cooperation
SECAP	Soil Erosion Control and Agro-forestry Project
SSA CP	Sub Saharan Africa Challenge Program
SWC	Soil and water conservation
TOFA	Tuban Organic Farmers
VICOBA	Village Community Bank

1. Introduction

The African Highlands Initiative (AHI), established in 1995, is an ecoregional program of the Consultative Group on International Agricultural Research (CGIAR) hosted by the World Agroforestry Centre (ICRAF). Until September 2007 AHI was also a network of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA). AHI operates as a consortium of national agricultural research institutes (NARIs) in Eastern and Central Africa (ECA) and international research organizations that work with local communities, local governments, and development partners in the humid highlands of ECA.

Rationale for ERIA

Building on the lessons generated from its benchmark sites, AHI seeks to expand methodological innovations in integrated natural resource management (INRM) to national and regional institutions in the ECA region.
AHI is also seeking to influence partners and member institutions on the crucial importance of action research and improved knowledge management on "process" – namely, methods and approaches for technology delivery, collective action, organizational reform, and natural resource management.

AHI is also cognizant of the fact that the CGIAR looks to its centers, system-wide programs, and AHI to produce international public goods that may in turn be used to bring about livelihood changes globally.

AHI's host institutions are requesting documentation and data on outcomes and impacts at the sites to strategically plan for future research and investment in the region. Frequent evaluation and feedback helps the program to improve planning, implementation, and monitoring activities, hence contributing to greater effectiveness in achieving set goals and objectives.

AHI, with financial support from the International Development Research Centre (IDRC), requested an external review and impact assessment (ERIA) to compile and analyze program progress and assess AHI's performance in the region.

While the evolution of AHI has occurred in several phases and required making modifications to its contextual framework, this review will concentrate on phases III and IV, drawing from the external evaluations of phases I and II (1995-2002).

AHI is seeking to utilize the knowledge generated from the review to improve overall program performance, based on learning and examination of the review process and findings. A secondary goal (to be achieved in subsequent phases after the ERIA) is to utilize the data to generate knowledge products for diverse stakeholders to heighten program visibility regionally, and to enable stakeholders to seek support for specific research agendas and strategies in the East African Region.

Report Structure

Part 1 provides a brief introduction to AHI, as well as the rationale and evaluation guidelines for ERIA. Part 2 presents the impact assessment methodology used in the ERIA. Part 3 presents AHI's strategic framework, regional up-scaling strategy, and impact pathway with

its declared outputs. This section also provides a summary of the key findings on institutional impacts as perceived by stakeholders, as well as their views on AHI. Part 4 provides an analysis of the household survey undertaken for this study. Part 5 identifies AHI's strengths and weaknesses and the lessons learned from the ERIA; it also provides recommendations on strategy and objectives, outputs and impacts, and program management. Annexes include household, FGD and key informant data analysis from sites, the household questionnaire and a focus group discussion assessment tool, list of people interviewed and of projects visited, a list of documents made available during the review, and primary household survey data for the four sites visited (see map: Ginchi and Areka in Ethiopia, Lushoto in Tanzania, and Kapchorwa in Uganda) during the ERIA.

Background

AHI was established in 1995 to facilitate collaboration and institutional strengthening of partner research organizations that provide useful contributions to solve complex issues related to natural resource management (NRM) and agricultural productivity. Solving the critical problems of poverty and land degradation has been the main preoccupation of AHI's regional work.

AHI works where the people and landscapes in the densely populated highlands of Eastern Africa are under increasing environmental and social pressure. Population growth, fragile landscapes, limited economic opportunities, and rapid climatic, political-economic, and cultural changes have superseded people's coping strategies, causing water shortages, deforestation, soil erosion, unreliable rainfall, increased incidence of pests and diseases, and increased poverty.

The ECA highlands face different challenges at local and institutional levels: (1) the potential of local people to manage their resources in a sustainable way and to articulate their demands is under-utilized; (2) natural resource governance has broken down; (3) conventional research approaches are not addressing the complexity of modern challenges, livelihood-NRM links, and farmers' demands; (4) limited capacity of researchers and their organizations and policy makers to respond to the challenges of working in an integrated, participatory manner (www.africanhighlands.org).

While food security and economic growth receive consistent attention by governments, development organizations, and research institutions, environmental degradation and services are often neglected. Increased agricultural productivity often comes at the expense of the sustainability of important agro-ecosystems, such as the intensively cultivated highlands in ECA. Forces that drive unsustainable resource use are: increasing human population, limited policies and short-sighted institutional strategies, and restricted livelihood options. These forces are driving unsustainable agricultural intensification through expansion into marginal lands; increasing competition and conflicts over water, grazing, and forest resources; eroding biodiversity, and discouraging investment to maintain or replenish natural resources.

Poor farmers, in particular, rely more on the resource base and can least compensate for land degradation, loss of wild sources of food and income, and diminishing natural sources of fuel, tools, and building supplies. If these sustainability issues are not tackled, hunger will continue and resource degradation will occur regardless of short-term gains in production. In addition to these, other "new generation" challenges are emerging. Climate change will bring dynamic changes to farming systems, influencing diversification and intensification patterns, and to the resources themselves. This additional pressure causes associated problems, the most serious being water shortages. Globalization will heighten interactions among market forces, related policies and potential productivity/profitability gains or losses, and associated impacts on the environment. On a more positive note, the trend towards decentralization offers the potential to increase the collective voice of poor farmers and could lead to better resource management, improved economies of scale in marketing, and increased advocacy for more conducive policies (AHI website, www.africanhighlands.org).

AHI's core role as an innovator is to develop novel methods and approaches for participatory integrated natural resource management (INRM) through: developing and testing in pilot sites; cross-site synthesis; and regional dissemination and institutionalization. AHI's targeted beneficiaries and partners in this work include national and international research organizations and networks, development organizations, local governments, civil society organizations, service providers, policy-makers, community-based organizations, and male and female farmers.

ERIA: Organization, Objectives, and Process

In this section we highlight the ERIA team's organization, the specific objectives of the task at hand, and the process that was followed. The Impact Targeting and Assessment Unit (ITAU) of the International Maize and Wheat Improvement Center (CIMMYT), member of the Consultative Group on International Agricultural Research (CGIAR), conducted the ERIA of African Highlands Initiative (AHI) supported activities in selected sites in the region. The project team consisted of:

Team member	Title	Based in
Mulugetta Mekuria	Team Leader, Ag. Economist	CIMMYT, Zimbabwe
Roberto La Rovere	Impact Assessment Specialist	CIMMYT, Mexico
Judit Szonyi	Consultant Economist	CIMMYT, Mexico
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Moti Jaleta	Field Consultant (Areka)	Ethiopia
Wondewossen Tsegaye	Field Consultant (Ginchi)	Ethiopia
Gracious Diiro	Field Consultant (Kapchorwa)	Uganda
Stephen Lyimo	Field Consultant (Lushoto)	Tanzania

The objectives of the impact assessment project are as follows:

1. Assess the extent to which the program is meeting its objectives and aims, as set out in its directives, and identify any evolution in program objectives;
2. Document and assess program results (i.e., outputs, outcomes, and impacts at various levels (i.e., household, landscape, district, and institution);
3. Offer reflections on the strengths and weaknesses of the program's thematic approach and strategies in relation to the current thinking and practice;

4. Assess the composition and functioning of the program team as it relates to its ability to meet program objectives;
5. Make recommendations on how AHI could adapt in light of the current situation and anticipated changes within the field of INRM research.

ERIA process and activities

To carry out the assignment within a short period of time and provide feedback to AHI, its stakeholders, donor, and host institutions, the ERIA team did the following:

- ✓ Performed a desktop review of all documentation (from the website, briefs, working papers, journal publications, and other relevant reports made available by AHI;[1])
- ✓ Carried out the household survey (see Annex 1-4) in four sites (Lushoto in Tanzania, Kapchorwa in Uganda, and Areka and Ginchi in Ethiopia) with more than 400 household interviews and data analysis, focusing on impacts on households, the community, and local institutions (quantitative and qualitative information);
- ✓ Conducted focus group discussions on landscape issues with farmer groups (see methodology and Annexes 1-3 for details);
- ✓ Interviewed stakeholders at the institutional level to record AHI outputs and assess AHI outcomes and, in some instances, impacts on partner institutions;
- ✓ Reviewed four field reports by consultants and a synthesis of the results of the household survey and focus group discussions.

The ERIA received useful input from AHI in two successive rounds after submission of the first draft of the present report. This included feedback from AHI site coordinators and some stakeholders. The input helped the ERIA to qualify some of the statements and put them into a more complete context. The final decision on which comments and feedback received from AHI and stakeholders to be taken into account and how, remained entirely with the ERIA.

A large amount of information has been collected that AHI can use for writing further research and knowledge products. This would also require a deeper analysis of many datasets, as discussed in Part 2. In many cases the results in Part 3 have already been grouped based on their relevance to research topics of interest to AHI: "Technology entry points;" "AGILE;" "Integrated management;" and "Self-led institutional change."
The ERIA has provided ample data in the main report and in the Annexes to update AHI research topics "Landscape and bylaw reforms" and "Farmer institutional development," and has offered reflections and evaluated the available data on the "ACACIA" and "Product dissemination" research topics. This was achieved by a direct meeting and e-mail exchange in January 2008 to document, verify, and provide suggestions for the ACACIA research topic, and through a web-based review of AHI products and e-mail exchange containing several recommendations and ideas for the "Product dissemination" topic, in early December 2007.

The ERIA team and collaborators are open to discuss with AHI how to add value to AHI research knowledge products in the future, after the conclusion of the ERIA. It must be noted that the ERIA is not a research study or report, so it focused only on its relevant findings. The ERIA, however, went beyond that and collected research relevant data and useful insights.

[1] At the time of the ERIA design, in November and December 2007, background information was requested to both AHI leadership and site coordinators. Documents were provided mostly limited to the Lushoto site, as well as 1 page briefs on various research aspects, but the ERIA was mostly referred to information on the website. Therefore we based our findings, deriving from AHI document reviews, on what was availed in time to us.

2. ERIA Methodology

This study adopted a series of tools—household surveys; focus group discussions, and stakeholder interviews—to answer AHI evaluation questions.

Household Survey Design and Data Analysis

The survey (see Annex 4) was designed to capture impacts on livelihoods and the environment; changes in attitude towards AHI-promoted NRM approaches; and cooperation in the community to solve NRM problems. It provided a rich database on household characteristics (age, educational level of all household members, assets, farm and off-farm income); land-use characteristics (crops, trees, livestock, soil conservation) and changes since the base year; applied AHI technologies (benefits and constraints); perceived changes in yield, crop production, income, cash for inputs, soil quality, credit access, changes in ability and confidence to experiment/invest in soil conservation; participation in training courses and farmers' organizations (received benefits); as well as improved cooperation, bylaws (community compliance) for improved NRM, and improved efficiency in solving conflicts in the community.

The selection of sites for the ERIA was decided by AHI, but within sites the methodological decisions were from the ERIA. The ERIA team conducted about 400 household surveys in four sites in three countries (in Lushoto, Tanzania, in Kapchorwa, Uganda, in Areka and Ginchi, Ethiopia) to assess AHI's progress in achieving its objectives. The total number of sampled households depended on allocations for field data collection. The following formula was used to calculate on site the sub-samples of households from different villages:

$$n = \frac{N}{1 + N(e)^2} ,$$

where n = sample size, N = population size, and e = level of precision.

The household survey was designed to assess program impacts at various levels (household, landscape, district, and institution). To gauge the effects of AHI involvement on well-being, households were selected from three different groups: (1) direct *participants* in program activities; (2) a *control group* (for counterfactual and baseline development); and (3) *other residents* of the pilot watershed to identify spillover effects (see Table 1 for numbers of household interviews).

Table 1. Number of interviews held in farm households at different sites.

	Participants	Controls	Other residents
Areka	61	21	23
Ginchi	45	35	20
Kapchorwa	60	20	30
Lushoto	44	23	25

To test different spillover levels, other residents were selected (as non-participants) in the same village as the participants in Kapchorwa, and from nearby villages in Lushoto, to which technology may have spread. The control group consisted of inhabitants of neighboring villages outside the watershed, where AHI technologies were not directly disseminated. However, some technologies are expected to have spilled over into these areas,[2] and it was not possible to control this during the sampling process. Site consultants identified households to be selected within each group.

Differences in the livelihood characteristics of participating and non-participating households (the "with-without" counterfactual) were integrated into the assessment of livelihood changes from the base year prior to the intervention (the "before and after" counterfactual); hence the use of questions that compared findings to a base year in the household survey. The base year for each site and household was defined before the interview to allow relating the questions to the correct date back in time when the interventions started and/or were adopted. Random or proportional sampling by gender and wealth was used within each of the above groups. This made it possible to analyze the data according to these three groups in aggregate, and for the analysis to disaggregate the data by gender and wealth.

Focus group discussion design and analysis

Focus group discussions (see checklist in Annex 5) placed greater emphasis on impacts at the landscape, district, and institutional levels with different stakeholder groups. The ERIA prepared, in close consultation with AHI, a list of AHI interventions for each site, and facilitated a discussion in which targeted questions were asked of different groups, in order to better articulate different stakeholder views.

Stakeholders' interviews

AHI provided a stakeholders' list for interviews and identified a wide range of contacts (Annex 6), from research and development partners to local, national, and international donors. The interviews provided insight into the institutional aspects of AHI activities. Most stakeholders answered a template questionnaire based on the impact evaluation questions provided by the ERIA team in consultation with AHI.

Data collection in Lushoto, Tanzania

AHI started working in Lushoto District in 1998 (Phase II), when a participatory rural appraisal was conducted in Kwalei village and farm-level NRM innovations were initiated. Study areas selected for the household survey and focus group discussions included six villages participating in AHI activities in the Baga catchment: Kwalei, Dule, Kwekitui, Kwadoe, Mbelei, and Kwehangala. Interviews were held using structured questionnaires and focus group checklists, with farmers classified into three groups: participants from three villages (Kwalei, Kwadoe, Mbelei), farmers from two non-participating villages that were expected to receive spill-over from AHI activities, and farmers from two control villages not expected to have adopted any AHI technologies/methodologies. Separate focus group discussions were held in each category, and farmers in each category were sub-divided into men and women to capture differences in perception of the effects or changes from AHI work. Pre-testing was done in Kwekitui village in November 2007. Based on available lists, 45 households were selected randomly from those participating in AHI activities. The two villages selected to represent non-participants were Kwesine and Bumbuli Mission, located

[2] Spillover effects were also identified in the control group, because they accessed improved seed at the local market. Thus some technologies (e.g., improved potatoes in Ginchi and taro in Areka) had impacts beyond the watershed.

close to the catchment, because there is mobility between them and the catchment farmers. Since they attend similar markets and share services, there are possible spill-overs or awareness about technologies across villages. The villages selected as controls are far from the catchments and have limited interaction with the catchments; since farmers do not attend the same markets, there is minimal mobility between them.[3]

Given the low capacity of locally available enumerators, and that they had not received earlier training in data entry, analysis, and report writing, it was agreed that the enumerators/moderators would be outsourced from another institution, the Farming Systems Research Socio-Economics Programme based at Selian Agricultural Research Institute (SARI) in Arusha. Participants in the focus group discussions were divided into male and female groups including 10-20 people each (see details in the Annexes for the specific groups) to gather perceptions from the two sub-groups independently. This yielded some comparatively different findings (see Annexes). Due to local culture and religion, the women were reluctant to speak or freely share their views in the presence of their men. Wealth ranking to sample the respondents could not be performed, as the ERIA was not made aware that a previous wealth ranking exercise was conducted in the area.[4] Participating households were drawn from the total households in the three villages. Knowing the sub-total numbers of men and women made it possible to calculate the proportion/number of respondents that had to be taken from each sub-group in order to total 45. The number of respondents from each sub-group was obtained by systematic random sampling. Fifteen respondents were sampled purposively from the remaining farmers in each sub-group for the focus groups. Purposive sampling was used to select representatives from the different technology groups in the catchment.

Data collection in Kapchorwa, Uganda

Three sites, including Tuikat Watershed, Kaseko soil and water conservation, and Tuban Organic Farmers (TOFA), were purposively selected for the ERIA. Land Care interventions have been implemented in these sites for at least three years. These sites have received capacity building and funding from AHI through KADLACC. A random sample of 110 respondents was interviewed (Table 2). A focus group discussion was held in each site with relevant user groups, and stakeholders and key informants were interviewed.

Two villages from each site were selected for the household survey; 20 AHI/KADLACC beneficiaries were randomly selected from a list of *participants*. The participating household had to have been with the land care association for at least three years. A random sample of 10 non-participating households *(other residents)* was selected from each village. For the *control group*, 20 households were selected from two parishes adjacent to the Land Care sites in two selected sub-counties (Tegeres and Benet).

[3] Obviously, apart from markets there are other factors that bring people together, including relationships through marriage, schooling, etc. Technologies that move fast, such as tomatoes and bananas in Lushoto, were found to have spread to very faraway villages. The ERIA does not exclude such spillovers, but focused on the main exchanges, i.e. through markets.

[4] The ERIA was eventually informed that this was done twice—once in 1998 and again around 2003—but this was not made available to the ERIA with the documentation at the time the field work was conducted.

Table 2. Sample selection.

Site	Sub-county	Households			Focus group discussions
		Participants	Controls	Other residents	
Tuikat Watershed	Benet	20	10		1
Kaseko soil and water conservation	Benet	20	10	10	1
Tuban Organic Farmers	Tegeres	20	10	10	1
Total		60	30	20	3

Other informal talks were held in Kampala with other key informants who were in the past or are currently associated with AHI (see Annex 6 for a list for all countries).

Data collection in Ginchi, Ethiopia

Primary household-level data were collected to investigate the intervention's effect on livelihoods. Further, discussions with stakeholders such as Holeta Research Center, "woreda"/district offices were also undertaken to assess the institutional success and challenge of AHI activities. Focus group discussions with farmers were also undertaken to investigate how project participants perceived specific technologies promoted by AHI. Additionally, documents including research publications and biannual reports were investigated.

From the five watershed villages where AHI is working, 45 *participants* were selected randomly from lists of known participant households, made available to the ERIA by AHI. To make the sample as representative as possible, all AHI interventions (technologies) were covered. From the neighboring villages where AHI activity has spilled over, 20 households were randomly selected as *other residents*. Further, 35 non-participant households were randomly selected as a *control* group from nearby villages where no AHI activity has spilled over.

From the five villages in the watershed, two (Tiro and Ameya) were selected purposefully to undertake a focus group discussion with AHI technology participants. AHI is very involved in Tiro regarding the number of participants and type of technologies promoted, whereas AHI involvement in Ameya is the lowest of all. Discussions were undertaken with male and female headed households. The focus group discussion discussed main issues, like: (1) benefits obtained from technologies promoted by AHI; (2) challenges and successes of farmer research groups (FRGs); (3) problems encountered while implementing AHI interventions; (4) access to technologies (whether the technology is also accessed by poor and female-headed households), (5) and other issues.

Data collection in Areka, Ethiopia

For the household surveys, a total of 105 households were selected for interviews using the sampling design discussed above. The sample included 61 participants, 21 controls, and 23 other residents. Focus group discussions (FGDs) were conducted at Gegecho and Ofa villages in Gununo Hamus Peasant Association, Gununo District. The major objective of the FGDs was to assess the impacts of AHI on the livelihoods and natural resource management of farmers living in Gununo watershed. In these focus group discussions, a total of 14 farmers (10 male and 4 female) at Gegecho village and 11 farmers (8 male and 3 female) from Ofa village have participated.

Relevant stakeholders interviewed included the head of the local agricultural office, site team members based at the Areka Agricultural Research Station, the Center Director, and the Director General of Southern Agricultural Research Institute (SARI), who shared his vision of out scaling the experiences of Areka Benchmark site to different watersheds in the region.

Recommended further use of data

The ERIA team collected a rich database through the household survey and FDGs. However, the length of the project, the high level of detail required, and the extensive qualitative data added to the survey at AHI's request absorbed most of the time set aside for the analysis and did not allow a more in-depth quantitative data analysis. Consequently, the ERIA focused on comparing descriptive statistics and frequencies on a few key indicators, mostly by comparing participants, the spillover group, and the control group. Many more hypotheses could be tested on whether impact is due to certain household livelihood assets or capital, gender differences, different levels of input use, income levels, or different typologies of farmers (social groups). Variables that can be used include levels of income or expenditure; yields per crops or trees; the time or cost reduction attributable to using conservation technologies, etc. These can be analyzed through regression analysis to test hypotheses with respect to the correlation between households' characteristics, adopters of different technologies or participants in different activities, and the benefits received from participating in those activities.

3. Key Findings: AHI Evolution, Outputs, Outcomes and Impacts

At the beginning of Part 3 we present ERIA's overall perceptions. The first sub-section includes the ERIA review of literature on outcomes (3.1.1) of skills development and training by AHI for different stakeholders (policymakers, researchers, extension agents), and AHI's contribution to promoting INRM approaches and methodologies in Sub-Saharan Africa challenge programs and ASARECA, based on information available at www.africanhighlands.org and materials provided by AHI to the ERIA.

This section also contains findings at the three levels at which the ERIA questions were assessed: "higher level" stakeholders, local level stakeholders, and farmers or farmer groups. The answers mainly address evaluation questions 1-3 but focus on particularly questions on impact. The "higher level" stakeholders' views at the national level refer mainly to views on AHI at the country level, and includes views on both institutional aspects (methodology, process) and household or local impact, as perceived by those stakeholders, based on their own experience and involvement in AHI. This report presents key findings in sub-section 3.1. The second sub-section (3.2) describes the views of local level stakeholders, by site (views mainly on local level impacts and recommendations, including from site coordinators). The third sub-section (3.3) describes farmer and community views captured through FGDs and household surveys and presents some key findings (details in Annexes 1-3).

ERIA Review of AHI's Strategy and Objectives

This section covers: (1) progress made by AHI in achieving its aims and objectives; (2) evolution of program objectives and interpretation; (3) changes in the context in which AHI works; (4) how AHI has adapted to such changes; and (5) the value that AHI adds to the field of INRM research.

AHI's evolution has 4 distinct phases. Phases I and II prepared the way for making clear impacts on farmer's livelihoods and the environment through improved crop varieties and other innovations. In phases III and IV the goals and objectives became more complex and challenging (Table 3). AHI started making good progress on promoting institutionalization of NRM approaches, despite its limited capacity to influence the pace of institutional change in most institutions. AHI seems to have undergone an adaptive learning process while responding to change, normally taking into account the views of different stakeholders at various levels. Yet the distinct phases show a swing and changes in focus probably in response to changes in the working context or, to a lesser extent, to changes in leadership.

Table 3. Evolution of the African Highlands Initiative

Phase I	✓ Regionally determined thematic technical agendas; ✓ Characterization and diagnosis; ✓ Integrated pest management, and ✓ Actions to improve land productivity.
Phase II	✓ Improved technical integration and farmer adoption; ✓ Increased farmer involvement and empowerment through participatory work; ✓ Attitude change on the part of farmers and researchers due to participatory methods; ✓ Improved tracking of progress (self-examination and documentation); ✓ Cross-site sharing and learning, and ✓ Multi-institutional contributions and progress in terms of wider appreciation and use of INRM approaches.

Phase III	✓ Linking farm-level improvements to other landscape issues, that require collective action; ✓ Scaling up INRM approaches to district level and beyond; ✓ Pursuing institutional change in favor of INRM; ✓ Enhancing networking among INRM practitioners, and ✓ Developing methodologies for collective action at landscape level.
Phase IV	✓ Further developing the watershed approach, focusing on enabling collective action and integrating biophysical, social, and economic dimensions of farm and landscape management; ✓ Deriving good practices and methods for development agencies from experiences at benchmark sites; ✓ Conducting research to understand links and dynamics between vulnerability, poverty, livelihood strategies, economic growth, and NRM; ✓ Methods for improving dialogue across all levels of decision-making (tradeoffs between different stakeholders, land-use scenarios), and ✓ Methods for enhancing self-led institutional change (evaluation of R&D partnerships, performance monitoring schemes, learning culture, improved communications strategies); ✓ Knowledge management: development of AHI Products (website, Working Papers, Methods Guides, CD-Rom, Proceedings) ✓ New strategies to share AHI lessons and methods with ASARECA member countries: regional training on AHI methods; product dissemination in ASARECA meetings, and training through the internet.

A number of changes have occurred in the context in which AHI works, in terms of shifts in emphasis on the research and scales at which AHI works, changes in key staff, and involvement of new key partners.

- Phase II: shift to a bottom-up approach, promoting participatory research methods, integrated systems perspective, multi-institutional and multi-disciplinary teamwork, pilot benchmark sites to test and demonstrate improved integration of inputs required to solve NRM issues and to test the new working modalities.
- Phase III: (1) shift in emphasis from farm-level to landscape-level NRM innovations; (2) partial shift in focus from promoting technologies (mostly existing ones, and already started to a certain extent during phase 2) to developing INRM methods and approaches; (3) increased emphasis on capacity building and institutional innovation; (4) reduced number of sites and enhanced cross-country sharing of lessons; (5) improved information sharing; and (5) a more efficient governance structure at the program level.
- Phase IV: (1) consolidation and further progress on achieving phase 3 objectives, in particular negotiation and multi-stakeholder engagement at the landscape and district levels, (2) deriving good practices and methods for development agencies; and (3) publishing and sharing results and lessons learned.

AHI's participatory learning methodology allows frequent examination and re-evaluation of program objectives, strategies and mandate. Frequent evaluations allow timely recognition of the need to adapt to constraints and opportunities and change the pathway to reach their goals accordingly. Constraints and opportunities were recognized at different levels: at the farm level (e.g., constraints to adoption of technologies), at the community level (conflicting interests in collective action), and in AHI's overall strategy (e.g., in terms of a paradigm shift towards institutionalization).

In the views of various stakeholders, it appears that progress on declared objectives[5] is generally good. There are also perceptions that at times AHI's objectives may have evolved with limited involvement of local stakeholders, and that thematic areas tend to originate more from AHI headquarters than from the grassroots level. This may be due to the fact that in the past the stakeholder base was not broad enough, yet those involved— farmers, researchers, and extension agents—participated in identifying problems and opportunities, and in prioritizing and deciding what should be done. AHI has both a regional and global mandate (CGIAR); within this context, all decisions are bottom-up but within a restricted institutional mandate.

Continuous, long-term funding, a result of AHI's successful work, allowed monitoring development pathways and socio-economic impacts since AHI's inception. The general goals and objectives of AHI are in line with INRM approaches of the CGIAR and others using participatory research. Types of participatory research most often used in AHI's current phase are "collaborative," as there is some degree of task sharing between researchers and farmers, along lines determined by AHI, and "collegial," i.e., researchers support farmer-initiated and farmer-managed actions. It seems there was also "consultative" participation, i.e., information was sought from farmers for scientists to develop solutions, particularly in the two previous phases. While participatory research is not AHI's own innovation, its effective application in the sites provided added value to the INRM field by:

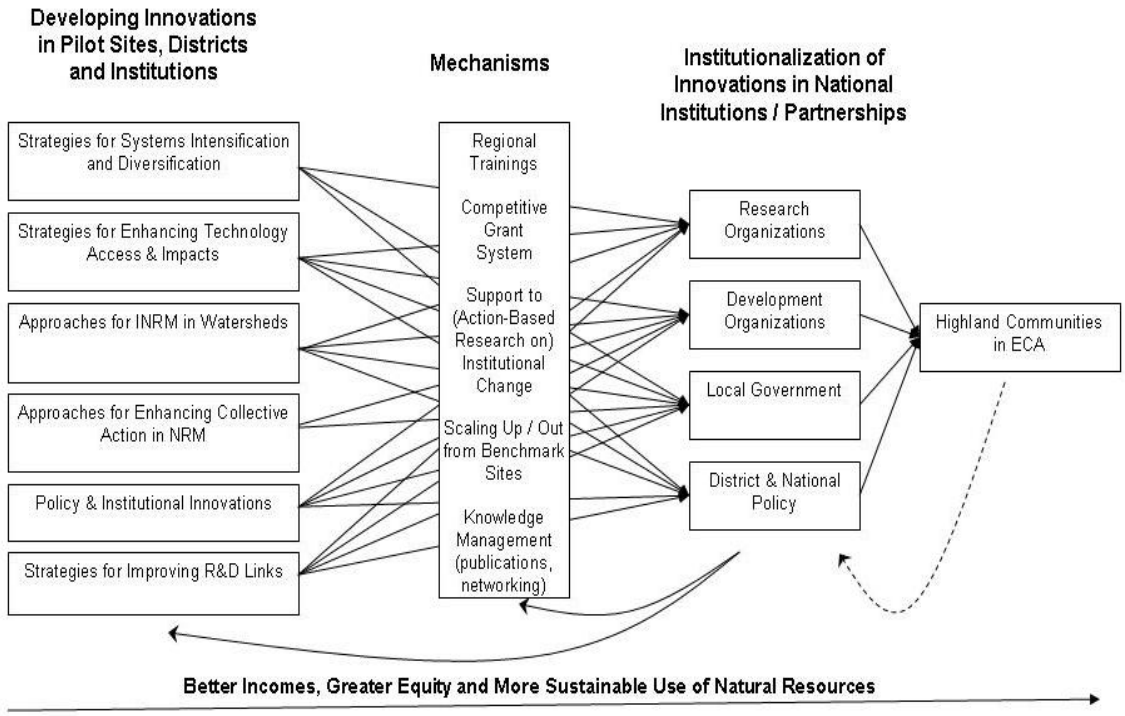
- Developing a shared vision of how natural resources should be managed;
- Individual and community empowerment, building confidence and capacity for collective action, advocacy, and innovation;
- Using a learning-based-on-action process of enquiry and reflection;
- Acknowledging, enhancing and incorporating local knowledge, beliefs and values;
- Learning from and coping with the perceptions of a broader set of stakeholders;
- Better understanding and management of social dynamics and biophysical complexity;
- Reaching and including less powerful stakeholders, such as women and disadvantaged groups, with a focus on resource access and social equity;
- Fostering interdisciplinary communication and facilitation as a means for dealing with conflict, finding new management arrangements, and promoting learning processes;
- Monitoring the results of actions derived from learning-reflection processes;
- Understanding and influencing micro-political processes;
- Operating at different technical, organizational, geographical, and time scales or levels;
- Managing change in local institutions to favor better livelihood and resource management;
- Developing approaches, methodologies, and tools that are effective in the field;
- Adaptation of the Land Care approach to the African environment (AGILE);
- Up-scaling of working approaches (e.g., in Rwanda);
- Product dissemination (information sharing) among partners, agricultural extension entities, and other organizations working for development in Africa.

[5] List of objectives and outputs are reviewed in the next section.

Overview of AHI Research, Objectives, and Outputs

AHI research is organized around four main research themes, often called "analytical thrusts." Regional team members are hired to provide technical support on these themes based on their areas of expertise. Specific projects and research sites have supported each theme in different ways over time.

(1) *Research and Learning on Integrated Natural Resource Management for Watersheds* and (2) *Collective Action in NRM* are carried out through in-depth work in pilot watersheds, where new approaches are tested and evaluated together with national partners. This work is funded largely through core funds (SDC and the Netherlands government) and supported by restricted grants targeting specific aspects of the process (IDRC for knowledge management, ECAPAPA for bylaw reforms, the European Commission for competitive grants, and so on). (3) *Research on Partnerships and Institutional Arrangements for INRM* is implemented through multi-institutional partnerships among research and development actors at the district or woreda level. This research theme is funded through the AGILE project (Italian government) and donors supporting the watershed work, with technical support provided in large part by the AGILE Coordinator. (4) *Scaling Up and Institutionalization* is implemented through scaling up research in AHI's benchmark sites and self-led institutional change processes within partner NARIs. The former is funded by donors supporting work in pilot watersheds, while the latter have been funded by the Rockefeller Foundation. While diverse RRT members support research on scaling out, AHI's regional research fellow supports the institutional change work through PhD research and co-facilitation of institutional change events. AHI's regional up-scaling strategy and impact pathways are summarized in the following figure:



AHI's strategic framework[6] provides an overview of the strategic goals and outputs of AHI for phases II and III to be further refined in phase IV. The following section provides a list of goals, outputs and objectives by AHI for phase IV. In the rest of the document and particularly in the concluding section, we discuss ERIA's perception of AHI achievements, most often based on stakeholder views.

Goal 1. Developing and promoting the utilization of INRM innovations to advance community-based participation in watersheds

- Methods to improve local learning, knowledge sharing, and adaptive experimentation and innovation for INRM
- Monitoring and evaluation processes that improve implementation, agreements, reflection, and adaptive decision-making
- Methods to engage multiple types of stakeholders in sustained action planning and implementation
- Methods and approaches that improve innovativeness, networking, proactive links to development activities, advocacy, and organizational capacity of local communities and stakeholder groups
- Methods to improve community mobilization, social capital, and collective management of resources, marketing, and conflict resolution
- Methods and technologies that improve farmers' ability to generate income and invest in NRM
- An integrated set of relevant technical and management options in the context of their applicability

Goal 2. To foster innovative development strategies, policies, and practices in support of INRM

- Methods that build common understanding, mobilize, and provide incentives to local leaders, service providers, and constituents to implement self-led development scenarios that improve NRM and livelihoods
- Decision guides to enable service providers to better support stakeholder decision-making in the selection of technologies and good practices, and in identifying and managing tradeoffs
- Strategies for service providers that improve inclusion of marginalized groups and ensure they benefit from development activities
- Methods that foster grassroots policy reforms to improve innovation, technology adoption, and more equitable and sustainable land use practices
- Methods to facilitate R&D contributions and catalyze institutional change to improve synergies, coordination, and complementarities
- Communication strategies and mechanisms to enhance the quality of information exchange between communities, NGOs, policy makers, and researchers

Goal 3. To enable more supportive institutional arrangements for INRM

- Research methods and techniques related to implementing an INRM approach
- Performance assessment methods that enable researchers and organizations to implement INRM approaches and principles

[6] http://www.africanhighlands.org/framework.html

- Mentoring and competence-building events for researchers and research managers in relevant skill areas (facilitation, participatory research, social analysis tools, integrated research, documentation and performance monitoring, managing teams and partnerships)
- Methods and strategies to catalyze self-directed institutional reforms (to manage paradigm shifts within organizations) to enhance research management and contributions to INRM
- Methods and strategies to improve teamwork and management of R&D partnerships to handle the multi-faceted challenges of research for sustainable development
- Methods and strategies to manage and integrate a wide range of expertise to improve implementation and facilitation of complex innovation systems
- Advocacy for the use of INRM approaches
- Mechanisms and strategies to scale up approaches effectively

Goal 4. To synthesize, publish, and increase access to INRM information that enhances the knowledge base of R&D stakeholders

- Documents and syntheses that analyze and disseminate lessons from pilot sites and projects
- Communication products on INRM produced and disseminated to various types of end users
- Technical advice and support is provided virtually to programs interested in INRM
- Networking mechanisms that link R&D actors interested in sharing information on applying INRM approaches
- Strategies and technical events that increase scientific exchange between scientists on INRM
- Communication and scaling up strategies

Outcomes and Impacts

The previous sections mainly discussed AHI outputs; the present section focuses on outcomes and impacts, as perceived by stakeholders at various levels (national and local stakeholders, plus key informants and focus groups) and as captured through household interviews. It should be noted that national stakeholders (depending on their knowledge and involvement in AHI) often provided views on a range of issues, from local impacts to wider institutional outcomes. Because they were not easy to separate, these views are often presented together, but the level to which they refer is specified.

Institutional outcomes
Included below are assessments of AHI publications and the AHI website, that focus on the outcomes of skill development and training for stakeholders (policy makers, researchers, extensionists), as described under goal 3 above, and of AHI's contribution to promoting INRM approaches in ECA.

AHI strategies to move beyond pilot sites and achieve regional impacts include: (1) the development of *approaches for improved scaling out of technologies*, (2) strategies to enable agricultural research organizations to lead effective *institutional change processes*, and (3) better *knowledge management*. The first of these is implemented largely through the design, testing, and dissemination of methods for technology dissemination that are more equitable and more effective in linking income generation to NRM, and that improve feedback from

end users—thereby providing crucial input back into technology generation and dissemination strategies. (The ERIA underlines that, as stated above, the focus of what has actually been scaled out is methods using locally available and tested options and technologies; see also the final sections on lessons learned and recommendations). The second strategy has been implemented through NARIs but is increasingly applied within extension and development organizations to enhance their knowledge and application of INRM principles and practices. Finally, knowledge management work is designed to strengthen in-field learning, as well as the publication and sharing of research results, lessons, and methods throughout the region and beyond. Below we present AHI achievements in institutionalization and knowledge management, as stated by AHI itself.

Institutional reforms in the Ethiopian Institute of Agricultural Research, Ethiopia
In 2004-2005, a series of workshops with the participation of Ethiopian Institute of Agricultural Research (EIAR) management and research center directors were convened for the purpose of developing action plans to address identified barriers to the institutionalization of INRM approaches. A core team consisting of EIAR managers, center directors, and representatives of regional research institutes was formed to discuss and coordinate capacity and methodology development; partnership strategies; researcher-farmer interactions and matching technology demand to supply; understanding and commitment of researchers to impact orientation; and alignment of resources, mechanisms (incentive and reward systems, planning, and monitoring), and structures in accordance with new priorities. After identifying key success factors and barriers to participatory research, EIAR targeted the following modifications in institutional structure and practice: (1) *proposal development, review and project management* (for improved coordination, minimal disciplinary competition, shifting from individual planning and implementation to interdisciplinary teamwork); (2) *a shared understanding of EIAR's vision and its implications for how business is done* (vision and strategy-led, impact-oriented research); (3) *a closer working relationship between regional and national research institutes and institutions of higher learning* (to minimize duplications, improve the flow of germplasm, skills, and technologies among the various levels of research within the country); and (4) *innovation systems* (for efficient and responsive technology development).

The main challenges encountered during the early stages of institutional reform are in terms of guiding institutional innovations within EIAR: (1) align technological options with appropriate domains, innovation systems, and markets; (2) integrate stakeholders, experts, and institutions to work together on common goals and innovations; (3) strengthen farmer involvement in R&D, farmer experimentation, and scaling up; (4) establish a knowledge and information management system in EIAR; (4) institutionalize M&E as a system to learn and improve how business is done; (5) intensify scaling up of knowledge and technologies; (6) motivate researchers to commit themselves fully and broaden their research endeavors; and (7) enhance policy development and implementation processes that build on the reality on the ground. Strong management leadership and national political commitment have catalyzed institutional innovations within EIAR that extend beyond self-led institutional change processes catalyzed by AHI.

Institutional reforms in Uganda's National Agricultural Research Organization
Since 2003; Uganda's National Agricultural Research Organization (NARO) has been involved in institutional reform processes following changes in agriculture research policy. In 2004 and 2005, workshops were convened to implement the reform process within NARO. So far, the following advances have been made, coordinated by NARO's Deputy Director for

Outreach: (1) an innovative theme-based structure that is better able to respond to clients' demands; (2) an integrated agriculture research for development (IAR4D) approach that goes beyond production and emphasizes strengthening human and institutional capacity for impact-oriented research; (3) creation of autonomous zonal research and development institutes to respond to local research priorities; (4) competitive zonal research funds geared towards addressing zonal research and development priorities.

Several actions were taken, including zonal research teams trained in the IAR4D approach; competitive grants scheme piloted, research themes reformed, and theme leaders assigned to ensure integration of the themes and alignment with local and government research policy. In Uganda, for instance, integrated learning teams consisting of representatives from NARO, local government, Makerere University, and AHI were formed and encouraged to innovate in applying the knowledge gained, and given follow-up to capture lessons and challenges, and a Planning and Implementation Team established to ensure that learning and work proceed according to plans and is reported to NARO Steering Committee.

Through the above changes, a common understanding of a new way of doing business has emerged, allaying initial skepticism. However, the following challenges have also been faced: development of effective partnerships for IAR4D, mechanisms to motivate staff, strategies to enhance farmer participation in the research process, structuring and sustaining multidisciplinary teams, strengthening skills and interest in policy research, writing competitive research proposals, and strengthening monitoring and evaluation systems. The iterative planning, action, and review process and the commitment of NARO leadership are expected to ensure that the above challenges serve as drivers for institutional learning and innovation. Other plans include capacity building on the principles of IAR4D (market chain analysis, participatory monitoring and evaluation, proposal development, stakeholder analysis, and team-building) on research stations and capturing lessons from the pilot phase to scale up successful institutional innovations.

Knowledge management

The aim of knowledge management is to increase the "knowledge base of R&D actors at national, regional and global levels on INRM principles, methods and impacts through improved information capture, packaging and sharing." Current knowledge management activities within AHI are funded by IDRC, and emphasize two main areas of activity: (1) improved *knowledge capture* within AHI pilot sites and programs; and (2) synthesizing, writing, and *publishing knowledge products* for diverse end users. Improved knowledge management aims to enhance learning from innovations tested in pilot sites, providing mechanisms, which enable site teams to better capture the lessons and effects of their own intervention processes on different social groups and on targeted outcomes. It also includes improved monitoring and impact assessment through annual reporting mechanisms and ex-post impact assessment. Strategies to strengthen learning among beneficiary groups and communities focus on participatory monitoring and evaluation.

Synthesis, writing, and publications within AHI are organized by key products within the Publication Series. These include AHI Briefs targeting policy makers, researchers, and development actors; AHI Working Papers targeting the scientific community as well as practitioners; AHI Project Documents, which document workshop and conference papers; and AHI Methods Guides, which capture AHI's primary international public goods in the form of methodologies and "best practices" for INRM. These documents are produced by researchers at site and regional levels who are directly involved in site-level innovations and

regional syntheses. AHI is testing new strategies for synthesizing key outputs, including conferences and writing workshops at site and regional levels.

AHI has a rich and well-organized website, an important tool to disseminate its knowledge products. The website appears to be mainly targeted at specific stakeholders (donors, research partners, extension, government, etc.). Some further improvements are possible: for instance, while it shows the overall strategy and objectives, monitoring and outputs of the projects, it does not facilitate some users with specific needs, as there is no search engine to find specific data amongst AHI online publications. Also, it targets only an English speaking audience. The current web statistics monitoring could be improved, since the 'number of click' figures alone doesn't reveal enough information, e.g. average time spent on the site, how people get to the site (keywords they look for), where from are people geographically, who are the users (NGOs, governments, universities....etc.), percentage of one time and returning users, etc.[7]

[7] See an example: http://www.knowledgebank.irri.org/stats/DEFAULT.HTM

Key Findings from stakeholders' Views

Tanzania: National level

Progress has been reported by various stakeholders, especially farmers. They relate it to technologies facilitated by AHI: (1) improved crop varieties: tomatoes, cabbage, maize, bananas; (2) rehabilitation of water sources and springs; (3) formation of savings and cooperative societies (SACCOs); (4) tree planting, establishment of nurseries; (5) soil conservation and enhanced fertility through terracing and planting fodder on terraces; and (6) reinforcement of NRM bylaws and assistance in conflict resolution on boundary trees. Sale of surplus produce, especially tomatoes, has increased household income and improved livelihoods. Farmers now can obtain loans for inputs, and the added income can be invested for educational purposes. Adoption of soil conservation structures has been limited due to lack of cash to pay those who teach farmers to make terraces, and the high labor intensity of their preparation.

Most soil and water conservation programs were not very successful because they did not focus on farmers' priority problems; also, as soon as the donor leaves, use of a technology declines.

Stratification of priority issues to derive themes was done at the site level in collaboration with regional teams. AHI's main achievement is solving NRM constraints through participatory approaches. Although these are common approaches used by many projects, the value added by AHI is the way INRM approaches are implemented, i.e., by combining a set of technologies, by using a multi-sectoral approach, by taking into account local knowledge, and by integrating different levels.

Some of the higher level stakeholders interviewed by the ERIA observed that NRM has always been on the government's agenda (see Annexes). Measures have been taken and bylaws established to protect the natural resource base. AHI is complementing the government's efforts and the working environment is quite conducive and supportive for them to deliver.

Apparently, AHI has not exploited all opportunities, such as in the private sector (e.g., in terms of looking at output markets), the Participatory Agricultural Development and Empowerment Project (PADEP; also has experience in participatory methodologies), the Agricultural Sector Development Program (ASDP), and district councils. Bringing these on board could limit human and financial constraints, as they can share the cost of implementing technologies and making AHI more sustainable.

Feedback from Tanzania's Selian Agriculture Research Institute (SARI). AHI's strong points are the participatory approach itself, capacity building, and improved technologies such as banana, cabbage, and vegetables, which can be marketed well and can reach distant markets. The introduced tomatoes are very successful as they have long shelf life and can be transported without spoiling. Farmers have started to grade tomatoes by quality to obtain better prices. There has also been facilitation of the process that led to more institutional linkages and partnerships, stakeholder involvement, and credit access. According to stakeholders visited at SARI, about 80% of AHI's initial objectives have been achieved.

Widely recognized was the need to reform and enforce bylaws, which had hampered local success. Such bylaws are essential for NRM, soil conservation, control of bushfires, etc., and AHI has started working on reforming them.

Feedback from the site coordinator. AHI has spent much time in the past and current phase on methodologies, while researchers, farmers, and other stakeholders would like to see it focus more on INRM-related technologies that save their land and ecosystems from degradation. There is a perception that the AHI approach has not yet been adopted by many institutions. Successful methodologies and approaches should be compiled into manuals and shared with stakeholders to reach a wider clientele. The ERIA recognizes that work along these lines is often at the initial stages or under development.

The main areas of focus of AHI work during all phases have been: NRM, soil and water conservation, livelihood improvement. Soil conservation has not been achieved fully despite much effort; no big changes can be seen (this depends on many factors such as the complexity of the problem, labor availability constraints, economic incentives, and inadequate enforcement of bylaws). Many projects have operated in Lushoto for a long time, such as the Soil Erosion Control and Agroforestry Project (SECAP), but what AHI has contributed is integrated management and the inclusion of local knowledge, such as the use of Tithonia to improve soil fertility. Other projects were proposed for inclusion in AHI, such as reclamation of water sources, reinforcement of local bylaws, and SACCOs.[8] AHI was able to include such projects depending on available operational funds. The main constraint that keeps farmers from taking up the technologies is the cost, but the constraints vary from case to case.

Feedback from Mulingano Agricultural Research Institute. AHI's progress is consistent with NRM and national conservation policies, and the approach is ready to be out-scaled, in particular several technologies, e.g., organic manure and terraces. Stakeholder participation in workshops and field visits has enhanced the dissemination of the approach (the example of Rwanda was mentioned).

Lushoto: Site level

AHI's main outputs have been the introduced technologies; reclamation of water sources and springs; increased water availability; reducing the time it takes to collect water; reduced incidence of water-borne diseases; encouraging village leaders to reinforce bylaws on boundary trees and water source management; assisting farmers in establishing tree nurseries and planting suitable trees on farm boundaries and water sources; mobilizing and supporting farmers to form SACCOs; reinforcing soil and water conservation structures; and establishing tree nurseries and planting trees in farms and boundaries.

Springs construction is an example of an activity that was not an original thematic area but has been (usefully) added, taking into account farmers' views and needs.

[8] One possible problem could be that the technologies may be addressing symptoms and not causes. Many soil and water conservation technologies do not really work as they capture soil once it has eroded. There is a need to address soil quality, to reduce erosion. Erosion does not cause land degradation, the land has already degraded and subsequently erosion occurs.

The quality and relevance of the introduced technologies are generally good. While farmer research groups were established as mechanisms to ensure continuity and sustainability when AHI phases out, specific measures and strategies needed to sustain the interventions after AHI leaves were not found. Examples provided by local farmers suggest that without AHI support (e.g. establishing tree seedling nurseries and maintaining terraces), farmers may not continue the work.

There have been changes in knowledge, attitude, and practices among farmers, and within communities and institutions. Farmers have acquired knowledge on the introduced technologies, now demand them or services related to technologies and can express themselves freely (also the women). Similar changes were observed at the community level, e.g., more harmony when dealing with water source/spring conservation, boundary trees, and soil conservation issues. These changes are critical for sustaining the approach. Outcomes at the district/institutional level include understanding, awareness, and appreciation of AHI activities and its contributions to NRM, and the intention to adopt the AHI approach.

In terms of impact, farmers reported improved livelihoods through AHI introduced technologies, which made it possible for people to improve their houses, achieve better household nutrition, produce more crops due to irrigation water availability as a result of the conserved springs and water sources, and pay school fees, among other things (see household survey results).

The main factors that facilitated the work include frequent training and visits, the participatory methods used, the involvement of village leaders; attention to gender aspects, provision of testing/demonstration materials (such as seed) and of building materials for wells, involvement in meetings/workshops, farmer exchange tours/visits, and radio and TV advertisements.

The thematic approach and strategy of AHI are perceived as not fully clear to all and focused. They seem to have shifted to some extent from the basic role of working on NRM, to more emphasis on participatory approaches and methodologies, which are already in use in some CGIAR centers. Also, the approach and strategy don’t always or systematically seem to be benefiting from input of local stakeholders. The same participatory process that is used at the grassroots should work for decision-making. Activities should be systematically driven by farmers and grassroot beneficiaries, to suggest issues to be included in the research agenda.

More adoption and impact could have been achieved if the program had more dissemination / promotional strategies/mechanisms such as field days, frequent radio and TV programs, and posters. Going through all district and village offices visited the ERIA found no AHI leaflets or posters.

Feedback from SARI. Some of the limitations encountered are: the high cost of inputs and low cost of outputs (which constrains soil conservation) and limited success (or effort) in publicizing the AHI approach at the national level. Facilitating factors are the close links with vegetable markets in Dar es Salaam, good infrastructure (tarmac roads), and mobile communication networks. The environmental impacts are on soil conservation, proper tree management, water source conservation, and restriction on farming and grazing near water sources and springs. One aspect that was reported as facilitating the success of the approach is that AHI has no employees in Tanzania, but it is the local partners who play a proper role.

This was indicated as fundamental to ensure AHI work and the sustainability of the approach. Key factors that facilitated success are farmer involvement and a focus on issues that interest them; and the fact that the funding has been sustained over the years, which is critical for investing in trees and soil conservation.

It is perceived that outcomes of AHI's work have been changes in the approach and attitudes of farmers and institutions. This was facilitated by farmers' exchange visits, e.g., AHI took farmers to Embu, Kisii, and Maseno in Kenya to see the effect of soil conservation, and this reportedly led to a change in attitude by Lushoto people. The effects of increased awareness and changed attitudes are improved livelihoods, increased knowledge, and better farmer organization. Without AHI there would be slow progress, or none, because of the inefficiency of the extension services.

Feedback from the site coordinator. A recent advance is the facilitation and, in some cases, development and enforcement of bylaws that address societal structures that limit the effectiveness of technologies. Economic incentives are behind the success of some technologies. The main impacts are generally improved productivity and livelihoods, the development of terraces (74,000 m), and improved water availability. It now takes 15 minutes for a farmer to collect water, instead of the two to three hours it took in the past. Water-borne disease incidence decreased from 77% to 22% in 2007; the time saved by reduced illness is used for productive activities.

Other impacts/changes, especially at the institutional level, are increased linkage and interaction with other institutions, which have led to more understanding and implementation of AHI activities. Positive actions have been the involvement of the judiciary, police, and lawyers (at the district council level) and the Tanzania Forest Research Institute in bylaw enforcement; of district leaders, including the District Commissioner (DC) and the District Development Director (DED), in AHI meetings, and of district heads including NRM specialists, the District Agricultural and Livestock Development Officer (DALDO), officers from cooperatives, community development officers, the water supply department, and the "CHAMAVITA" Lishe Trust, which deals with marketing issues. All the above achievements have been possible thanks to changes in attitude by district leadership, including the DC and the DED, participatory development and implementation of work plans, and advertisement of the reclamation of water sources on radio and TV.

Feedback from DALDO and DED. The main beneficial technologies are tomato, soil and water conservation, tree seedlings, and watershed management. There is high farmer participation in AHI, and without AHI, there would be little research and few resources for capacity building in the area. There has been success in water management and conservation in general. AHI is complementing the work that is supposed to be done by the government, and chiefly by extension services, and providing capacity building in areas where SECAP did not work. The main perceived spillovers of AHI work in Lushoto to other areas consist of SWC and crop varieties. Successes have occurred in initiating SACCOs, and facilitating and enforcing bylaws. A change in attitude brought about the use of farm manure, participation in trials, and use of tree seedlings. AHI is targeting the right area, as there are water shortages and NRM problems, and taking into account farmers' needs. In Lushoto, land degradation and soil fertility were serious problems, but measures were not always taken because village leaders and councilors do not sufficiently play their required role in reinforcing the required bylaws. AHI has been facilitating bylaw implementation, and has initiated NRM and interventions aimed at conserving water sources/springs.

Uganda: National level

From the discussions held with key informants, AHI has provided strong support to the communities in Kapchorwa district, particularly in land care and land management. Progress has been made in achieving AHI aims and objectives. AHI's support has mainly been through building capacity and testing institutional innovations at different levels. One key output is the role it played in KADLACC. At the district level, the KADLACC coordinator has reportedly benefited from several training courses, conferences, and workshops focusing on land care and group dynamics. The skills acquired have facilitated the coordination of NRM activities between KADLACC and several community-based organizations (CBOs). The CBO executives have applied the knowledge and skills they acquired in numerous AHI training courses and workshops to facilitate learning and implementation of land care approaches at the farm level. For instance, leadership skills and training in group dynamics have helped form farmer groups. All CBOs are now able to identify problems, suggest solutions, demand interventions, and draw and implement their annual workplans. Farm-level development has enhanced adoption of best practices through collective action. Group members have been able to adopt labor intensive technologies (such as terraces) by pooling their labor. Formal training of KADLACC staff is tailored towards improving service delivery and program sustainability.

Despite the established land care leadership structures, the coverage of AHI interventions is still limited. There is need to scale out the project activities to a wider geographical area, both in the Kapchorwa district (as the whole district faces the same land degradation problems) and in other agro-ecologically similar areas nationally. Partnerships linkages in Kapchorwa can be improved further. The presence of NAADS in the district provides an opportunity for scaling out. Also, though AHI has facilitated the documentation of methods, the knowledge products (brochures, leaflets) only target a limited audience, mainly international. There is need for AHI to pro-actively develop an aggressive publicity campaign to inform the public on research approaches and products (outputs) available in the area. Conducting farmer field days and engaging in radio/TV talk shows and airing land care programs on the local FM radio station in the local language could be good avenues of publicity and extension. There are reports of delays and generally inadequate funding made available for KADLACC to implement its activities. Identifying potential donors and building the capacity of KADLACC staff to write competitive proposals for grants to implement land care activities are suggested.

Feedback from NAADS. AHI has proven to have strengths in bringing together partners; for instance, NAADS is part of AHI's national working group that helps in sharing experiences. AHI has provided training to strengthen farmer institutions, field activities, and particularly the Telecenter in Kabale, mentioned as a successful initiative (firstly developed by AHI with NAADS, then handed over to 'NAADS farmers'). Telecenters are now managed by NAADS, an achievement that ensures the sustainability of the approach. Farmers are now able to access information. AHI brought together a set of different stakeholders and contributed to the formation of the NGO coalition, an association of many organizations addressing land care issues. Land care activities were facilitated by AHI with NAADS support in mainstreaming the approach. NAADS has developed out-scaling guidelines and has started applying them in a few districts. AHI has made farmers (for instance in Rubaya subcounty, Kabale district) aware of NRM practices, and they now decide which enterprises to undertake based on the effects on the environment.

One limitation is that AHI is implementing activities in small areas, e.g., in only one village in the district. What needs to be out-scaled is the approach that AHI tested. Positive outcomes include increased farmers' awareness (particularly in Kabale); established farmer associations such as farmer parish committees in Kabale; and development and application of NRM methodologies, which eased the challenge of integrating NRM into the extension system. The dissemination process has yet to be completed (though good internationally, in terms of publications, papers, and capacity building), as there isn't sufficient publicity nationally.

Feedback from ASARECA. AHI has recently begun focusing on aspects that are quite different from previous issues, due to changes in AHI leadership. ASARECA still has an NRM program that interacts with AHI in various ways. The functional mechanisms and modalities of ASARECA collaboration still have to be developed and agreed upon. The shift in AHI focus towards NRM and soil and water conservation is important for the highlands.

Kapchorwa: Site level

General findings. In terms of technology development, AHI has spearheaded participatory research that has generated a number of land care approaches that are giving good results in Kapchorwa. Better land care and management approaches have been introduced in the area of SWC technologies (terracing, tree planting, agroforestry), sustainable river bank management, bee-keeping, zero grazing, and fish farming, among others. Among the reported impacts are higher yields, improved soil fertility, more food availability in households, increased milk production, and improved household incomes. However, such impacts need to be attributed with caution, as many players have been promoting land management activities in the area (e.g., Action AID, the government, Appropriate Technologies Uganda, NAADS and, in the past, IUCN). AHI contributed to such improvements through capacity building,. Participatory research and technology development has empowered farmers in terms of ownership of the program, which facilitates technology uptake. In conflict resolution AHI has facilitated the formulation of bylaws on land management, grazing, and boundary co-management that were formulated with community involvement. The bylaw formulation process is at an advanced stage: outcomes include fewer conflicts among community members reported to local councils, less communal grazing, shared responsibility management, and control of national park resources.

Ethiopia: National level

The two benchmark sites in Ethiopia have been participating in AHI activities for many years. Stakeholders feel that AHI's biggest contribution has been enhancing and creating awareness and appreciation of INRM among scientists, as well as changes in mindset on the critical importance of INRM. Clear evidence of these changes can be found in the ongoing development of watershed-based project proposals that the government is ready to finance.

In terms of institutional impacts, attempts are being made to mainstream INRM into the national research agenda and implement it in nine watersheds located in the highland, mid- and low-altitude areas of Ethiopia.
Stakeholders indicated that the future AHI activities should consider the following issues:

- Both national and regional research programs need technical back stopping. Continuous capacity building support in action research is critical to ensure participation of stakeholders and to contribute to sustainability.

- Capacity built in participatory research and other methods and tools has been depleted because of high staff turnover at the sites and is leading to the loss of institutional memory.
- A feasible exit strategy in the years ahead should be formulated.
- Developing a model watershed approach is urgently needed to scale up INRM.
- Short-term training in project development and writing, and social science skills.
- As trained staff often leave, there is a big gap in the capacity to write publications and promotional materials at the site level. This capacity should be built.
- Livestock-crop integration and SWC interventions would be best served if AHI could utilize its in-house capacity to backstop NARS in replicating AHI methods.

In Ethiopia AHI sites are coordinated by national agricultural research system (NARS) researchers, and the programs are part of the specific research center where the benchmark sites are (Ginchi is under Holetta Agricultural Research Center-HARC, while the Areka benchmark site is under Areka Agricultural Research Center). A number of stakeholders gave their opinions on AHI's many impacts in developing methods and tools to promote INRM in Ethiopia through the two benchmark sites. Over the years, AHI has undergone various historical changes and processes and has influenced many NARS scientists, particularly in the area of participatory research, systems thinking, bottom-up approaches, and local institutions, among others. However, the way it was designed and the expected outputs were much beyond the capacities of AHI. For instance, it is clear that the various CG centers are not actively participating in the R&D process. It was not easy for NARS to adopt cost sharing and fully committed participation. The conventional systems, which were going on parallel to AHI in the various NARS, sometimes became a barrier to change and influence. AHI was also too financially weak to influence much bigger and stronger NARS and projects. In general, AHI impact was felt by communities within the pilot learning sites but was limited elsewhere. However, AHI's role in facilitating change with in NARS is acknowledged, particularly in EIAR research centers.
Moreover, AHI's strategy, which is achieving impact by influencing NARS, has depended more on personal relationships with the managers than the core principle per se. The same is true of fund raising.
The strengths of the AHI program are: a strong commitment to NRM; capacity building of partner institutions and scientists; advocacy for change in research approaches; influencing other actors; consolidation of system components and their relationships; influencing communities through social science tools; and writing influential papers and publications. The weaknesses are: imbalance (in recent years) between social and biophysical sciences; challenges in selling AHI approach beyond the immediate sites and participating actors; challenges in moving out of the traditional sites; and, in recent years, difficulty to write convincing proposals to obtain funding.

Ginchi: Site level
The AHI site team used participatory need assessment to identify entry points in the area and prioritize the community's livelihood problems. The process identified poor water quality and quantity in the watershed as a priority. The AHI site team, the local community, and the local water resources office collaborated in developing and managing the spring. Improvement of water quality and quantity has been impressive. Stakeholders at Ginchi clearly appreciated the fact that AHI listened to their problems before introducing its programs. AHI also initiated construction of soil bunds and planting of different tree species to stop soil degradation in the area. Integrated forage development with high-value dairy cows and

integrated energy use were also introduced in the watershed. AHI has also facilitated the dissemination and utilization of improved seed. The relationship between these interventions and the ultimate objective of promoting INRM was recognized by the stakeholders.

AHI's progress to the integrated Natural Resource Management (INRM) at watershed level is a product of experiences gained at different phases of the activities (i.e., from phase I to phase IV). Passing through phases of activities, AHI focus shifted from specific sites to landscape and watershed levels and from top-down to bottom-up approach in a concentrated team based effort

AHI activities are undertaken jointly with farmers, who participate actively in AHI's soil and water conservation and production enhancing innovations. Farmers research groups established to develop and manage resources have facilitated quick knowledge transfer among farmers and encouraged them to test practices that could help them manage resources in a sustainable way.

Regarding AHI's implementation of INRM methods and approaches, stakeholders at the site and national levels acknowledged successes in the following areas:

- *Program continuation*. The fact that AHI works under the umbrella of the Holetta Agricultural Research Center, that staff are regular EIAR (not AHI) employees, and that AHI activities are integrated into the activities of the research center means that program/activities will continue even if AHI support ceases. According to the Director of EIAR's Soil And Water Management Research, in 2006 the then Acting Regional Coordinator discontinued the allocated budget support from AHI, but activities nonetheless continued with EIAR financial support.
- *Replicability of AHI approaches*. AHI's integrated watershed approach was reported to be a replicable approach for technology promotion and dissemination. For instance, the Holetta Research Center recently prepared its Business Reengineering Program (BRP) and plans to adopt the watershed approach. Further, seeing AHI's success in working with farmer groups, the district agricultural office has followed a similar approach to promote technologies in other villages.
- *Stakeholder participation.* AHI has managed to attract participation by local community leaders, district and kebele (village) officials, and district extension workers. This will help follow up and promote INRM at the watershed level. AHI has coordinated communities and NARS partners in diverse activities, such as the following:
    - Development of methods for sustaining farmer-to-farmer dissemination of seed potato cultivation;
    - Development of approaches for reducing excess run-off through collective action (constructed soil bund on five hectares of land);
    - Development of approaches for fostering collective action in spring management (three springs)
    - Distribution and planting of 58,015 different indigenous and exotic tree species.

As for the springs, all households (170) in the watershed are benefiting from the clean water. Benefits from the spring have spilled over to households in neighboring villages. All springs are managed by the farmers themselves through their group/user committee. The water-user group has enabled the farmers to manage the springs well and seek support from AHI.

About 30% of the households in the watershed are direct participants in AHI's soil conservation activities, which include constructing soil bunds and planting grasses and multipurpose shrubs. Changes in attitude and awareness of the benefits of soil and water conservation were observed during focus group discussions with the farmers. In addition to training and visits to successful soil and water conservation areas, the experimental design that AHI researchers are implementing in farmers' fields has facilitated farmers' change in attitude and increased awareness of INRM.

In each of the five watershed villages, FRGs have been established to manage issues arising from soil and water conservation activities. However, in most cases FRGs seem too weak to enforce their soil and water conservation bylaws. Some farmers recommended that local government officials become involved in bylaw enforcement. However, beyond bylaw enforcement, some farmers believe more in working individually than with FRGs on soil and water conservation activities; others believe it is impossible to effectively manage natural resources using this approach due to problems of property rights at the community level that encourage the current practice of free grazing.

AHI's integrated crop and nutrient management activities, which include farmers' exchange of improved seed varieties, were also found to be beneficial to farmers in the watershed area. For instance, in one village potato has become the main cash crop, due to its high market value (600 birr/quintal), replacing barley. In another, the local potato seed has been totally replaced by the one introduced by AHI. Due to the introduction of linseed, the previous cropping pattern in the watershed (barley followed by fallow) was changed to barley followed by linseed. Further, in one village it was reported that linseed has become the second cash crop after potato in the watershed area. The emergence of these new cash crops is expected to contribute to investments in soil fertility options, such as purchasing inorganic fertilizers.

Farmers' research groups working on integrated crop management are doing a good job of managing the collective tasks of seed multiplication, preparation of organic nutrient, and marketing. However, some still believe that working individually is better than working in a group, if they can get the seed privately. As a result, some groups have problems enforcing the by-laws.

With regard to access to technologies, farmers who participated in the focus group discussion explained that equal access was granted to female-headed households and the poor.

Areka: Site level

Stakeholders interviewed indicated that methods developed for sustaining farmer-to-farmer dissemination of seed of improved crop varieties, approaches for reducing excess run-off through collective action, approaches for fostering collective action in spring management and controlling of porcupine in the watershed as the program success. The program has met its objectives at the household and watershed levels.

The benefits of linking technologies such as soil-crop-livestock management with soil conservation practices, and facilitating negotiation and participatory bylaw reforms for managing landscape level processes are well acknowledged. Stakeholders identified the

following as AHI's major impacts in the Gununo watershed (at both the household and landscape/watershed levels):

- Providing abundant clean water to the community through spring development.
- Reducing soil erosion on farm plots through constructing soil bunds.
- Using forage plants (elephant grass) to stabilize soil bunds and as sources of forage.
- Reducing the time farmers spend on policing farm plots and eradicating porcupine.
- Providing improved wheat and taro seeds on credit.
- Helping farmers to develop their own bylaws to self-govern the sustainable utilization of AHI-introduced technologies.
- Educating farmers on the effect of eucalyptus trees planted on farm boundaries and near water points.
- Organizing farmers into FRGs to adopt new technologies and demonstrate them to other farmers.
- Emphasizing equal access to technologies among different social groups.

At the national level, AHI works with the national food self-sufficiency program. Soil conservation practices satisfy both national and community level needs. Households at Gununo have small landholdings on a slopy land that usually suffers from soil loss by erosion. Thus soil bunds are a great help in maintaining soil fertility and increasing yields and overall production for food self-sufficiency. The use of the entry points listed above illustrated the need to continue current integration efforts and stimulate INRM adoption.

Stakeholders reflected upon the program's approach at Areka and came up with a list of its strengths and weaknesses.

Strengths: The use of a participatory approach in all of the interventions.

- Empowering people to identify, prioritize, and resolve their own problems by coming together with minimum external assistance.
- Encouraging and facilitating the formation of local bylaws by the community to sustain AHI's program benefits.
- Program well accepted by the beneficiaries.
- Bringing tangible changes in all intervention areas that could be measured both quantitatively and qualitatively by farmers themselves.

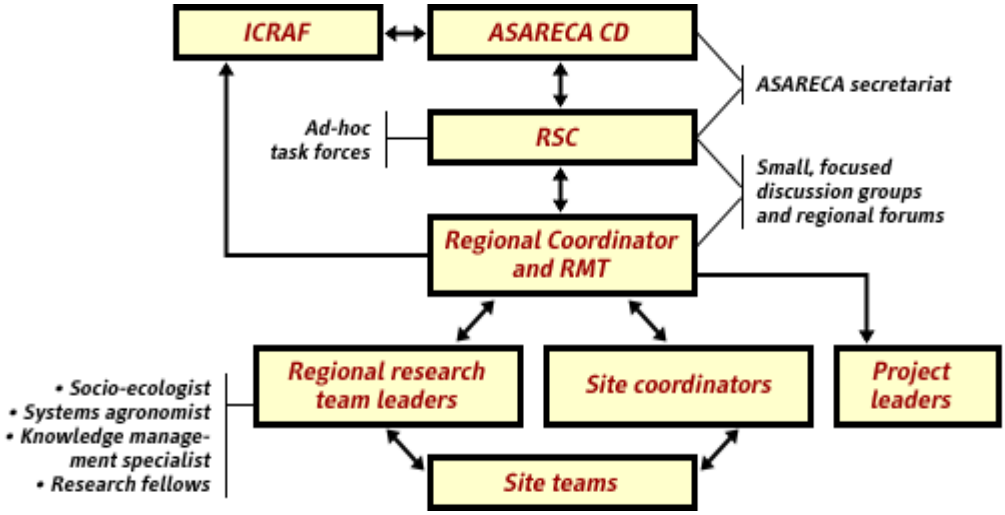
Weaknesses: It was perceived that the research teams could have payed more attention to recording and documenting data on the changes in the community after AHI's interventions. Most activities are run by the co-coordinator. There is a need to decentralize more to the research team members.

Program Management and Performance Management System

This section reviews AHI's program management[9] and assesses composition and functioning of the AHI program team as it relates to its ability to meet the program's objectives. The ERIA views, based on this and various stakeholders' feedback, are set down in section 5.

The Regional Steering Committee (RSC) provides the overall policy and strategic direction for AHI, reviews progress and approves annual work plans and budget, and reports to the ASARECA Committee of Directors through the Regional Coordinator. The RSC is composed of Director Generals of NARIs and representatives of host institutions (ICRAF and ASARECA) and donors. The RSC Chair is the Director General of the NARI that hosts AHI. The RSC meets once a year and ensures that the priorities in AHI's research agenda are in line with national agricultural research priorities; the Regional Coordinator is responsible for reporting on progress, issues, and work plans to the RSC.

The regional structure is displayed in the figure.



AHI has a performance management system (PMS) to ensure that it remains focused, relevant, and effective in the delivery of its outputs and accelerated impacts. PMS is operationalized at various levels: regional, national, site, community. The purpose of regional-level PM processes is to monitor the overall progress of AHI within the context of ICRAF and ASARECA MTPs and CGIAR outputs. Regional-level reviews ensure activities are in line with AHI focus and outputs, and that impacts are aligned with workplans; they also ensure financial accountability. Regional-level reviews include: *staff performance appraisals*; *external program and management reviews* to assess progress toward CGIAR priorities; and *program-level reviews* (e.g., the current ERIA) to assess outcomes and impacts since the inception phase across all projects and sites.

Implementation strategies at the national level ensure that within host countries, national focus points in NARI headquarters help to guide the overall strategic direction and performance of AHI in-country. This is done through participation in *RSC* and *National Planning and Review meetings*, or through *site team meetings* and *field visits*.

[9] Mainly based on information available on www.africanhighlands.org/governance.html

Site-level reviews ensure that research objectives and practices respond to farmers' needs, that activities align with work plans and budgets, and ensure accountability. Mechanisms for site-level reviews include *site team planning, review meetings, process documentation,* and *participatory monitoring and evaluation (PM&E).* These often have many positive spillovers, e.g., documentation of impacts and lessons, capacity-building of collaborators and alignment of site, national, and regional expectations. Some site teams have used these reviews to create new opportunities to institutionalize research methods.

In 1999 AHI began mainstreaming PM&E practices into site activities. An improved PM&E framework was introduced to build the capacity of stakeholders in AHI sites to reflect on performance and draw lessons from key areas of methods development. These include: participatory research; farmer innovation systems; partnerships and multi-institutional collaborations; and scaling up. A regional research fellow (RRF) was hired to develop and implement the PM&E, and a project inception meeting was held at ICRAF to establish AHI's regional planning, monitoring, and evaluation system.

An iterative social learning process led by RRT members and site teams has been utilized to instill practical skills in process documentation and integrate this in community-level PM&E. Monitoring progress is essential to ensure that challenges in implementing integrated NRM approaches are identified and addressed in a timely manner. Annual site workshops with site and regional teams have also been used to strengthen planning and review procedures, and to jointly tackle bottlenecks faced in implementation.

Community-level reviews monitor progress toward achievement of objectives negotiated during community-level diagnosis and planning. Community-level reviews consist of informal visits by site coordinators and theme leaders to monitor progress across activities, more formal participatory monitoring and evaluation events, and periodic IAs. These reviews help to: monitor changes in livelihoods and community dynamics; negotiate resource allocations; strengthen farmer organizations; ensure compatibility of technologies to field conditions; adjust innovations and activities to the challenges faced; and increase farmers' confidence and capacity to conduct their own experiments. Participants include community and watershed leaders, farmer groups, site coordinators, site team members, and regional research teams.

Evolution of the AHI team and management

The evolution of AHI team and management was influenced by feedback from external and internal evaluations of previous phases. In phase II AHI adopted a benchmark "integrated research team" approach and appointed national and site coordinators. In phase III the number of sites was reduced to enable improved funding of pilot site innovations and cross-site, cross-country sharing of lessons. AHI replaced the thematic working groups with regional sessions focused on specific INRM-related research areas and outreach thrusts to assist other integrated research teams. More balance between research and networking was achieved, ensuring that new research dimensions and methods currently not addressed by NARIs and IARCs are tackled.

Composition and functioning of the program team (using views gathered locally)
There are two AHI site teams in Lushoto, a core team consisting of three people (including site coordinators) and a site team that includes 7-8 people from AHI collaborating institutions, depending on need and thematic areas. The teams are generally working well, but

it may be expensive to mobilize them because of their number and the fact that AHI does not have contracts with site team members. The core teams function based on trust and depend much on the people involved. Regional work plans are usually prepared by the AHI office in Kampala, in consultation with the site coordinators, along common thematic areas that potentially receive funding across sites for particular years. They review the work plans from the sites for clarity, context, and harmonization, then present them to donors as one document. The sites have been challenged to solicit their own funding through proposal submissions to other sources; this would allow the sites greater flexibility in terms of areas they can address. The reporting system (annual report, workplan, budget) is essential for obtaining funding. The frequency of reporting was reportedly good and efficient, as well as the required communication, as reported by various stakeholders, including the Zonal Director Northern Zone and the Deputy Zonal Director Eastern Zone at Mlingano Research Institute. More funds are reported as required for the monitoring and evaluation (M&E) of activities. The site is included in the internal annual review and M&E for the Ministry of Agriculture, Food Security, and Cooperatives in Tanzania.

The AHI team in Ginchi site is composed of researchers from Holetta Agricultural Research Center (HARC). Each team member is responsible for at least one INRM activity (technology) promoted by AHI. All team members are HARC full-time staff and are expected to undertake AHI activities as part of their terms of reference. Their salary is fully covered by HARC. In the different phases of AHI activities, the composition and functioning of the team members has become more coordinated and integrated. However, from a discussion with AHI team members certain problems were identified as the ones most hindering the team from effectively implementing planned activities. Lack of distinct mechanisms that allow researchers to divide their time between AHI and HARC activities was reported as one of the challenges. Due to this problem, AHI activities are sometimes considered secondary by the researchers. This may contribute to poor follow-up and coordination of AHI activities. High staff turnover and minimum incentives/rewards for the research team undertaking AHI activities were also cited as affecting the effectiveness in implementing the AHI program.

A similar AHI team structure is in place at Areka Agricultural Research Center, which is under the Southern Agricultural Research Institute (SARI) of the Southern Peoples and Nationalities Regional State based in Awssa. The Regional State allocates a budget to Areka Center, and its operations are coordinated by SARI.

4. Key Findings of the Household Surveys

AHI's other outcomes and impacts affect farmers' livelihoods, the environment, and natural resources on which local people rely for a living. The household surveys, FGDs, and stakeholders' interviews highlight AHI's many achievements and impacts at different levels. The subsequent sections highlight the major findings of the household surveys at the four sites.

Lushoto Site, Tanzania

Since the inception of AHI activities in the area, farmers have reported changes in a number of indicators and aspects of their livelihoods. This section presents highlights of the results. See Annex 1 for more details on findings, data, figures, and farmers' observations. The general characteristics of the households interviewed in Lushoto are given below, in relation to few indicators (Table 4).

Table 4 Household characteristics, Lushoto

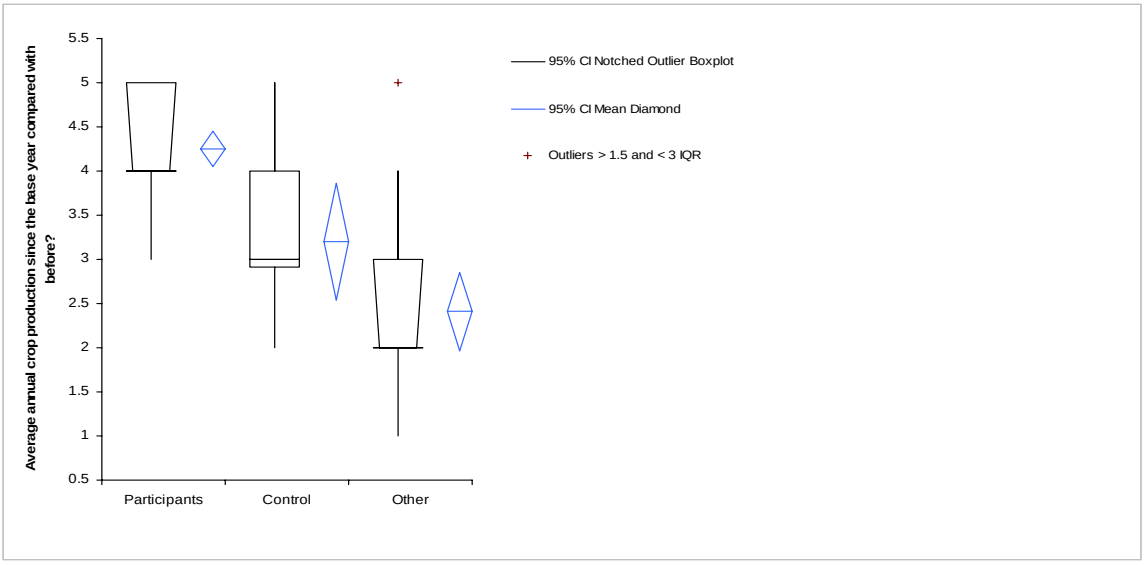
	Participants N=44	**Control N=23**	**Other Residents N=25**
Gender of Respondents (Male/ Female)	25/19	18/5	18/7
Female headed households (% of total)	11	13	28
Average size of households (members)	6.4	5.6	6.0
Average age of HH heads (years)	45.3	44.1	48.4
Average age of the households (years)	22.68	21.57	25.17
Literacy of HH head (Prim./Sec./N.A.)	38/3/3	22/-/1	22/2/1
Average land size owned (acres)	5.59	2.13	3.64
Owned assets (per households)			
• Plough sets / Carts	0.02 /0.02	- /-	- /-
• Wheelbarrows / Borehole	0.07 / 0.07	0.09 /-	0.04 /-
• Spray pumps /Diesel pumps	0.55 /-	- / -	0.24 / -
• Water tanks / Grinders / Hand hoe	0.05/0.20/3.48	- /0.13/2.30	- /0.24/2.76
• Car / Motorcycle / Bicycle	- /0.02 /0.39	- /0.04 /0.13	- /- /0.24
• TV / Radio / Mobile Phones	0.05 /1.18 /0.57	0.04/ 0.74 /0.43	0.08/ 0.88/ 0.36
• Beehives / Mosquito nets	0.05 /0.09	- / 0.13	- / 0.16
Animals (per households)			
• Bull/ Equines / Oxen	0.16 / - / -	- / 0.09 / -	0.08 / 0.08 / -
• Adult cows (improved/local)	0.77 / 0.55	0.48 / 0.39	0.08 /0.40
• Calves (improved/local)	0.32 / 0.11	0.35 / 0.13	0.08 / 0.28
• Pigs	0.09	0.04	0.12
• Goat/Sheep	2.89	0.57	0.6
• Chicken	6.89	3.22	3.72
HHs with inadequate food security (% of HHs)	39	48	36

Given below are the best and most popular technologies introduced in the site, as ranked by farmers, and the percentage of participants voting for each:

- Improved crop varieties (banana, tomato, sweet pepper) (80%)
- Soil conservation practices (52%)
- Spring development (30%)

Adoption of improved crop varieties had positive effects on the majority of households. Crop production and yield increased for the majority of participants, while on average the control group reported no changes, and the majority of other residents perceived declines in productivity and yields. In the participant group only a small minority reported no change, and none reported declining crop production.

Overall crop production change compared to base year

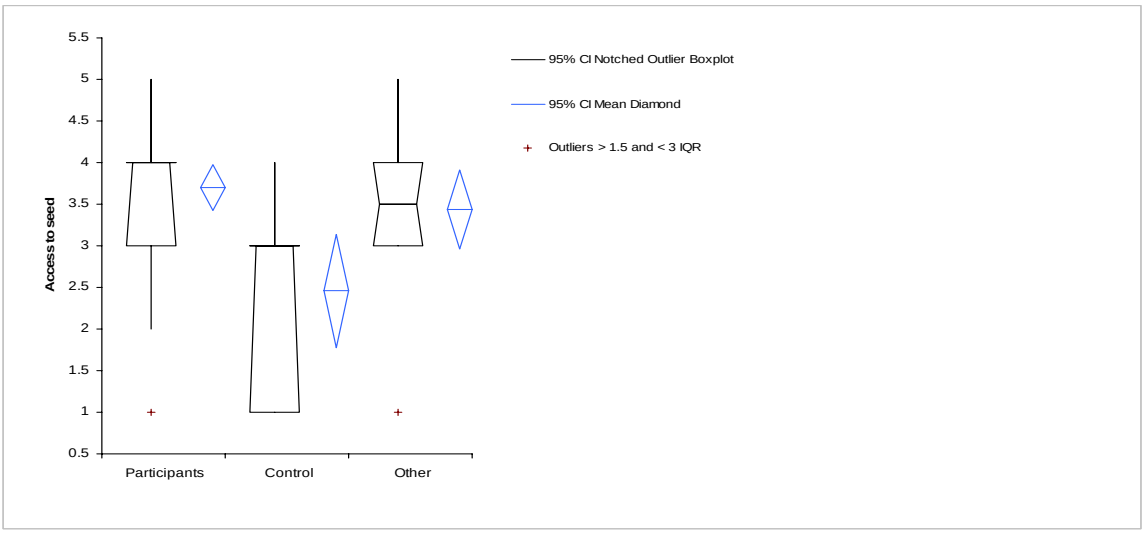


1-much worse, 2-worse, 3-same, 4-better, 5-much better
Note: The base year for non-participants is 1998, and for participants, the year when they first participated in AHI activities (1998-2006).

The drivers of improved productivity reported by participants were better management and conservation practices as a result of training, knowledge and skills acquired, and technical assistance and technologies from AHI and other extension services. Many farmers praised the new seed varieties (banana and tomato), which increased their yields and, therefore, their income from agriculture. In the words of one farmer: "Multiple technologies availed by AHI have helped get enough yield so that one can even save some production to have seed for next season."

The ability to access quality seeds increased in the participant group and the other resident group (spillover), but decreased in the control group. People reported that access to quality seeds is not a problem, as it is also available from the market, but many have little or no cash to buy the seed.

Perceived changes in access to quality seeds

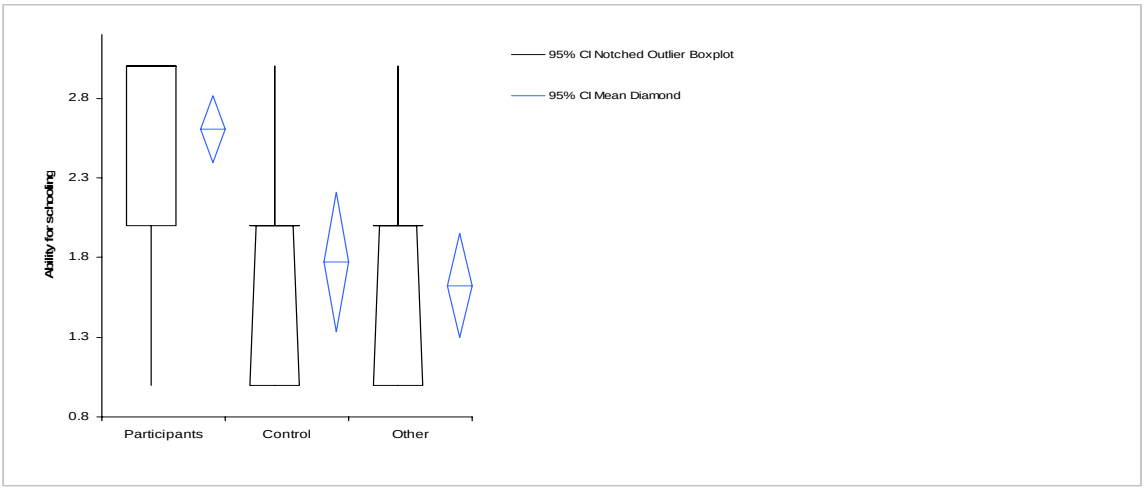


1-much worse, 2-worse, 3-same, 4-better, 5-much better

Participants (more than 90%) reported significantly higher income, yet they perceived no changes in the cash available to buy inputs. The control group reported no change in their income, but less cash available for buying agricultural inputs. The other residents reported declining income, and reduced cash available for buying inputs.

The majority of participating farmers reported increased ability to send their children to school, while this ability decreased for the control group and for other residents.

Changes in the ability to send children to school



1-decreased, 2-same, 3-increased

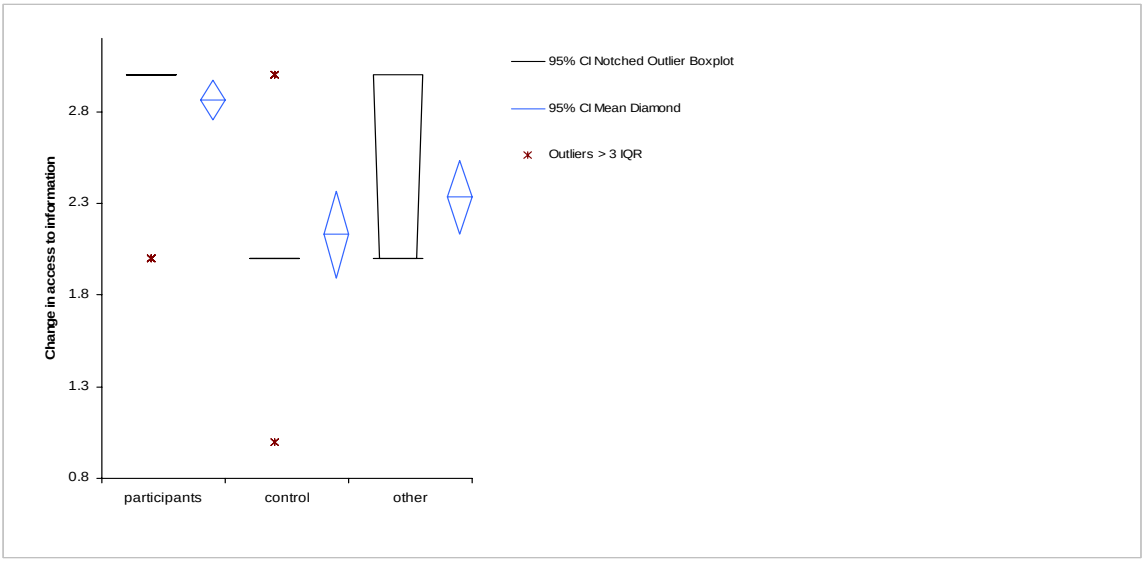
Out of 44 respondents:

- Seventeen participants reported not having adequate food through the year. Only four of these reported improvements in food security due to AHI introduced technologies.
- Five participants received credit from SACCO and VICOBA. Their reported ability to borrow money increased, while the other residents reported no changes (insufficient data for the control group).

Access to information (i.e., on input and output prices, technology, financial services) increased significantly in the participant group, while there was only a marginal increase in the control group, and a slightly greater increase in the other resident group.

- Farmers reported increased awareness through meetings with AHI and other extension staff. The use of radio and cell phones also contributed to better access to information. Participants reported better communication among themselves and with other farmers, traders, and input suppliers.

Changes in access to information



1-decreased, 2-same, 3-increased

Many new crop varieties were introduced (% of participants who reported using the technology is given in brackets): tomato (59%), bananas (48%), maize, coffee, beans (14%), sweet pepper (11%). Farmers reported benefits in terms of improved productivity and increased income. The perceived benefits of planting trees (*Grevillea, Avocado, Eucalyptus, Senna Siamea)* were improved productivity, soil conservation, increased income through sale of quality timber and/or fruits, and access to fuel wood. The benefits of improved livestock were access to milk for consumption, cash from diary products, and manure. Improved livestock reportedly is also less prone to diseases.

The main soil conservation practices are bunds, terraces, fallow mulching, manure, and *fanya juu*. Farmers reported improvements in soil quality and productivity, but also such constraints as lack of cash and labor availability.

One of the main impacts in Lushoto site, as perceived by farmers, was spring development. The main benefits mentioned were: easier water access; increased water quality and quantity; fewer conflicts over water issues; women spend less time fetching water; better sanitation; fewer illnesses, and lower medical expenses. The main factors behind better water quality are bylaws that protect water sources, restrictions on cropping near water sources, planting indigenous trees such as *Ficus*, and training on proper water use.

Fifty-two percent of participants reported that success in implementing innovations increased their enthusiasm to enroll in other innovations, and 43% of participants said that participation in AHI activities resulted in greater enrollment in new AHI activities. As stated by several participants in AHI activities, "New crop varieties lead to increased yield and income, allowing fertilizing the soil. Cash from tomato facilitated investments in second knapsack sprayer. Cash from tomato resulted in investment in building and animal house. New banana varieties led to increase (through renting) land size and more input use. Terraces increased tomato, beans and maize production on slopes. Tree planting led to starting a business using timber for making furniture."

Sixty-eight percent of participants experimented with linked technologies, and 77% thought that linked technologies increase the rate at which they adopt technologies. Some examples (see more in Annex 1):

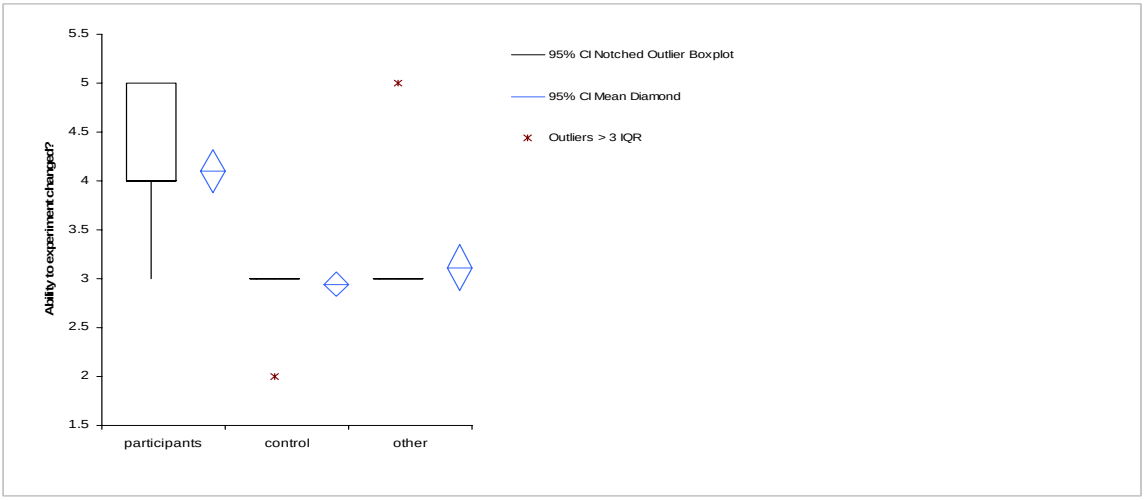
- Improved crops, trees, fertilizer use, animal manure, soil conservation;
- Livestock and crops;
- Terraces and manure in maize and banana fields;
- Intercropping of tomato/yams, coffee/banana, maize/beans, and banana/trees;
- Soil and water conservation, bananas, tomato, beans, maize, trees;

The participants observed many benefits that they related to AHI activities and presence (% of participants who reported improvements in their farms given in brackets):

- Improved productivity (100%),
- Controlling water source degradation (97%),
- Controlling land degradation (95%),
- Improved negotiation of resource conflicts (68%);
- Increased knowledge of management practices (95%),
- Better water access (93%),
- Increasing water quality (87%),
- Better pest and disease management (88%).

The participants' ability to experiment with different technologies was reported as significantly improved. Only a few reported no changes, while the majority observed positive trends.

Changes in the ability to experiment on owned/used land since base year



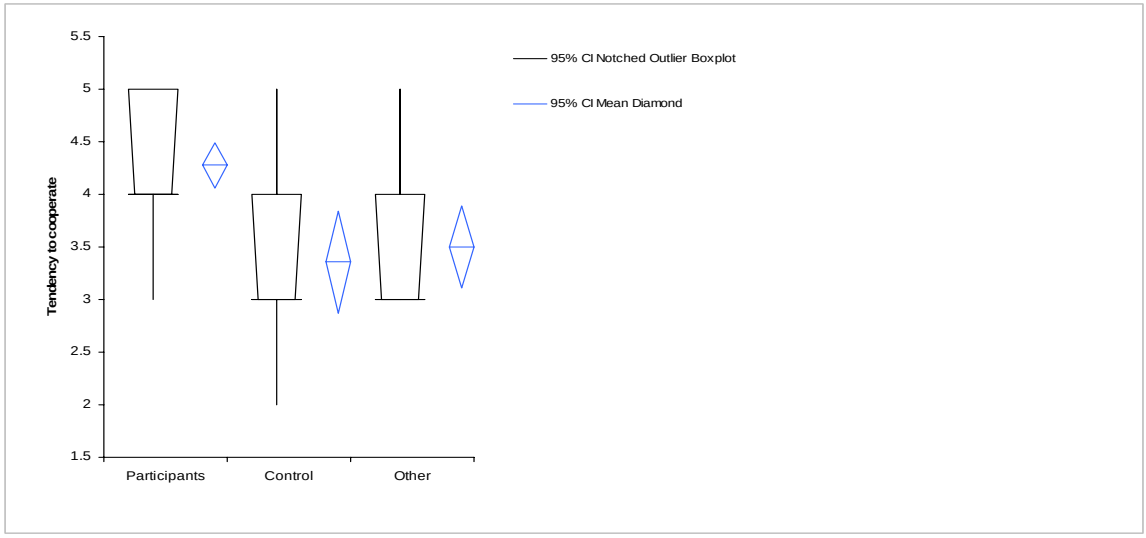
1-much worse, 2-worse, 3-same, 4-better, 5-much better

Community participation to collectively address farm productivity concerns was also reported to have significantly increased since the base year. The most common benefits of participating are: access to information, training, and credit. Training was given on different subjects: crop management (tomato, banana, coffee, beans, maize), tree nursery establishment and management, livestock and pasture management, spring management, soil and water conservation, compost making, financial management and business planning, and establishing and managing SACCOs.

AHI also focused on supporting negotiation in the community. This support was reported to result in fewer conflicts over (1) farm boundaries, (2) use of irrigation water, (3) spring protection (maintaining water quality and quantity), (4) eucalyptus close to water sources, (4) tree cutting, (5) SACCO, and (6) free grazing. Fourteen percent of participants reported that support from AHI helped them to overcome conflict, and 39% claimed that AHI played no role.

Cooperation (e.g., collective action to solve NRM issues) on issues of common concern among farmers increased significantly, while the control group and the other residents group reported almost no change.

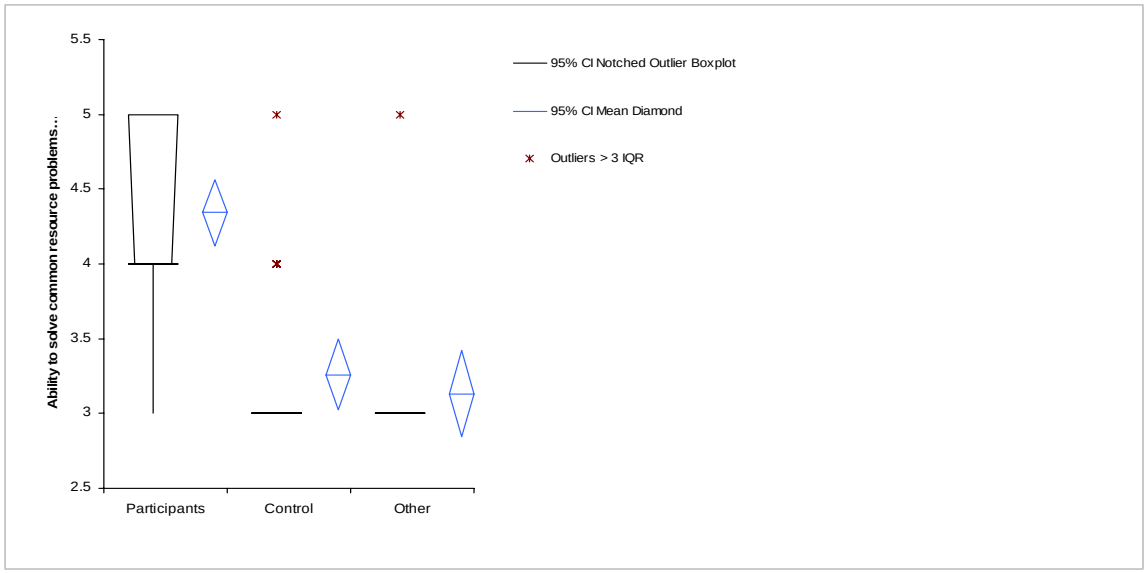
Tendency to cooperate



1-much worse, 2-worse, 3-same, 4-better, 5-much better

The ability to solve common resource-related problems was reported as significantly improved for participants, compared to the control and other residents.

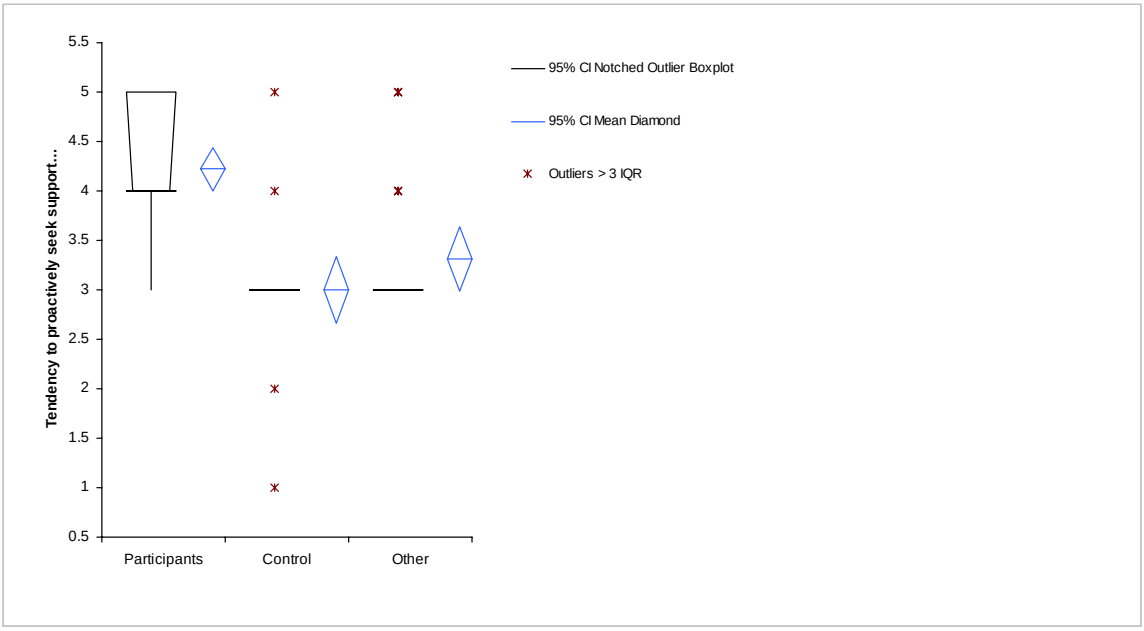
Ability to solve common resource-related problems



1-much worse, 2-worse, 3-same, 4-better, 5-much better

The tendency to proactively seek support from service providers increased significantly for the participants, with no change in the control group and slight change for the others.

Tendency to proactively seek support from service providers



1-much worse, 2-worse, 3-same, 4-better, 5-much better

Eighty-six percent of participants reported increased confidence in their ability to solve NRM problems. Examples of reasons given by the participants are: “Increased awareness (from AHI) of natural resources issues helps to identify problems and solutions.” “Increased ability to work alone in the absence of NRM staff.” “I can educate others on land issues such as land conservation since I have gained experience.” “Now I am more knowledgeable and able to work independently and get high returns.” “I am involved in District team of terrace establishment and this is the result of training from AHI.”

Kapchorwa

Since the inception of AHI activities in the area, farmers reported changes in a number of indicators and aspects of their livelihoods. This section presents highlights of the results. See Annex 2 for more details on findings, data, figures, and farmers' observations. The general characteristics of the households interviewed in Kapchorwa are given below, in relation to few indicators (Table 5).

Table 5 Household characteristics,Kapchorwa

	Participants N=60	**Control N=20**	**Other Resident N=30**
Gender of Respondents (Male / Female)	35 / 25	17 / 3	20 / 10
Female headed households (% of total)	7	0	3
Average size of households (members)	7.98	6.9	6.2
Average age of HH heads (years)	41.63	40.25	40.27
Average age of the households (years)	11.76	17.80	19.29
Literacy of HH head (Illiterate/up to P4/P9/S)	6 / 4 / 29 / 21	2 / 3 / 7 / 8	3 / 2 /12 / 13
Average land size owned (acres)	2.67	2.06	2.37
Average owned assets (per households)			
• Plough sets / Carts	0.45 / 0.03	0.35 / -	0.27 / -
• Wheelbarrows / Borehole	0.15 / -	0.15 / -	0.03 / -
• Spray pumps /Diesel pumps	0.38 / -	0.4 / -	0.27 / -
• Water tanks / Grinders / Hand hoe	0.02 /0.07/3.93	- /0.10/4.05	- / - /2.63
• Car / Motorcycle / Bicycle	0.07 /0.03 /0.10	0.05 /0.05 /0.10	- / - / -
• TV / Radio / Mobile Phones	0.03 / 0.75 /0.33	0.05 /0.80 /0.50	- /0.83 /0.27
• Beehives / Mosquito nets	0.58 / 0.38	- / 0.70	0.17 / 0.37
Average number of animals (per households)			
• Bull/ Equines / Oxen	0.33 /0.13 /0.42	0.25 /0.30 /0.65	0.33 /0.13 /0.27
• Adult cows (improved/local)	1.15 / 0.32	1 / 0.50	0.87 / 0.40
• Calves (improved/local)	0.77 / 0.20	0.50 / 0.10	0.53 / 0.13
• Pigs	0.02	-	0.10
• Goat/Sheep	2.27	3.10	1.53
• Chicken	6.97	6.40	5.00
HHs with inadequate food security (% of HHs)	40	35	53

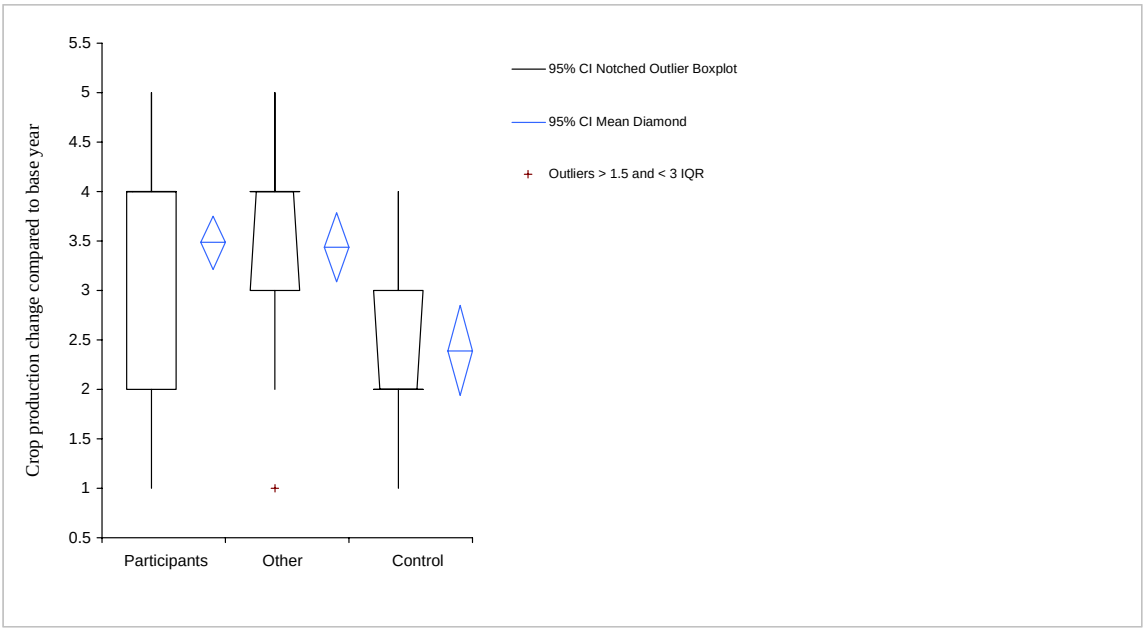
The main technologies promoted by AHI in Kapchorwa, as reported by farmers, include:

- New crop varieties (including cash crops): bananas, maize, coffee, Irish potato
- Livestock: diary cows, zero grazing, fish farming in ponds, beekeeping
- Agroforestry options: eucalyptus, grevellia, cypress, avocado, apples
- Soil conservation practices: bunds, terraces, grass, fallow, mulching, trenches
- Fertilizer: urea, DAP, cow dung, compost, maize stalks
- Fuel saving technologies: tree planting, biogas, better stoves

The most popular technologies reported by the participants were fuel-saving technologies, beekeeping, and tree management.

The participants and other residents did not perceive changes in yields, while the control group reported they decreased. Almost half of the participants produced higher yields; the other half reported declining yields. However, average annual production compared with the base year increased for participants and other residents and decreased for the control group.

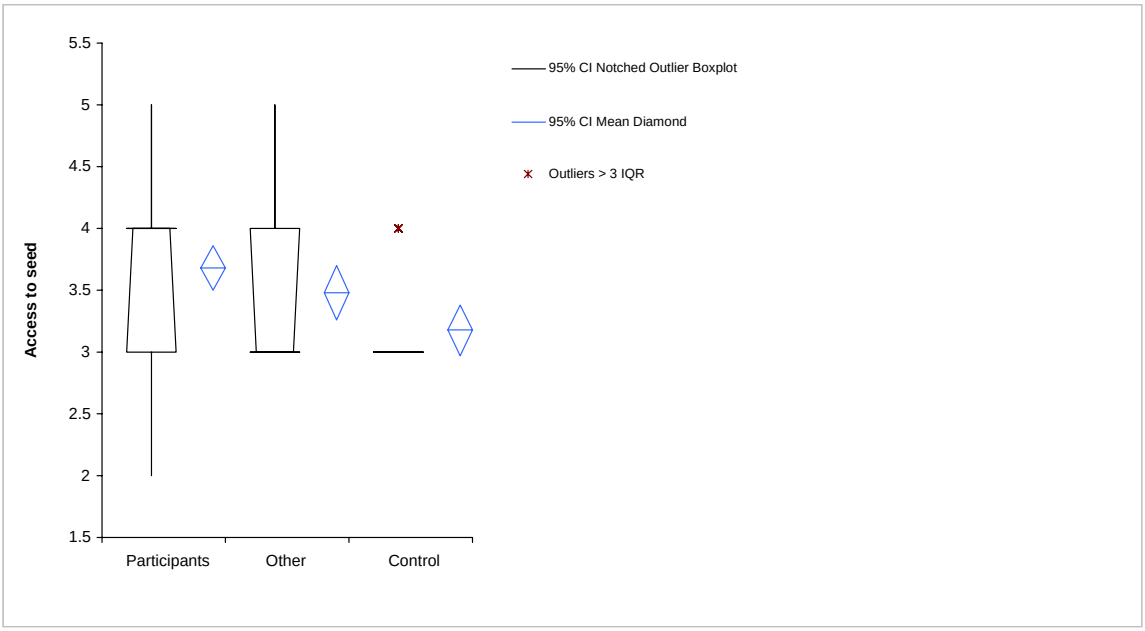
Changes in crop production compared to base year



1-much worse, 2-worse, 3-same, 4-better, 5-much better

There was a positive change in the access to quality seeds in the participant group, with spillover to the other residents, while the control group reported no changes.

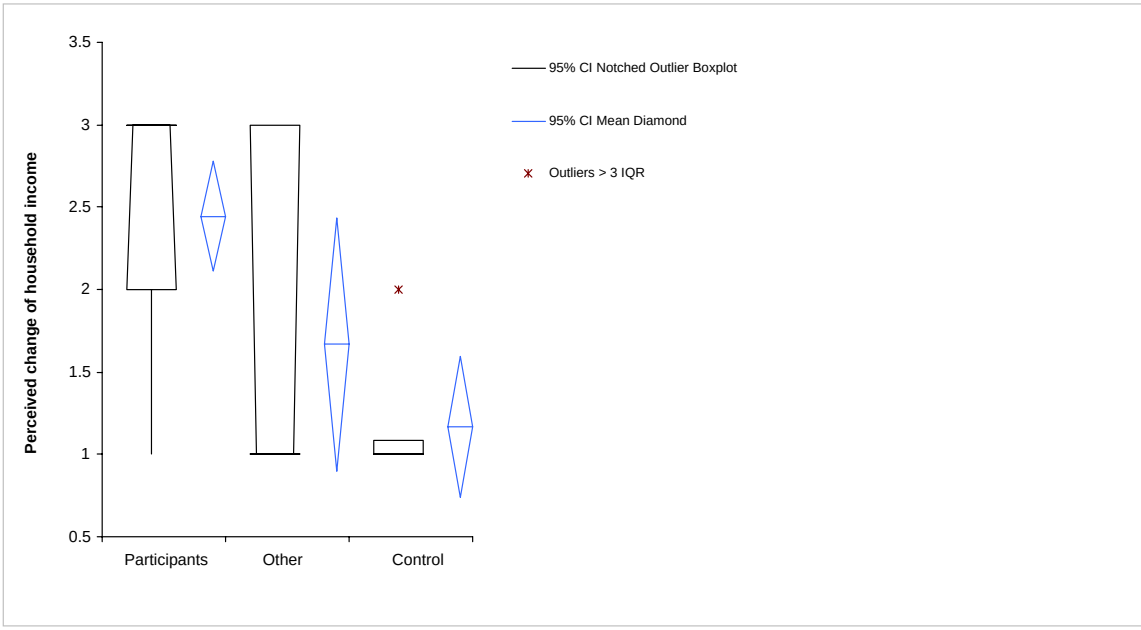
Perceived changes in access to quality seeds



1-much worse, 2-worse, 3- same, 4- better, 5- much better

Household income was perceived to have increased for the participants, decreased slightly for the other residents, and definitely decreased for the control group.

Changes in household income



1- Decreased, 2- Same, 3- Increased

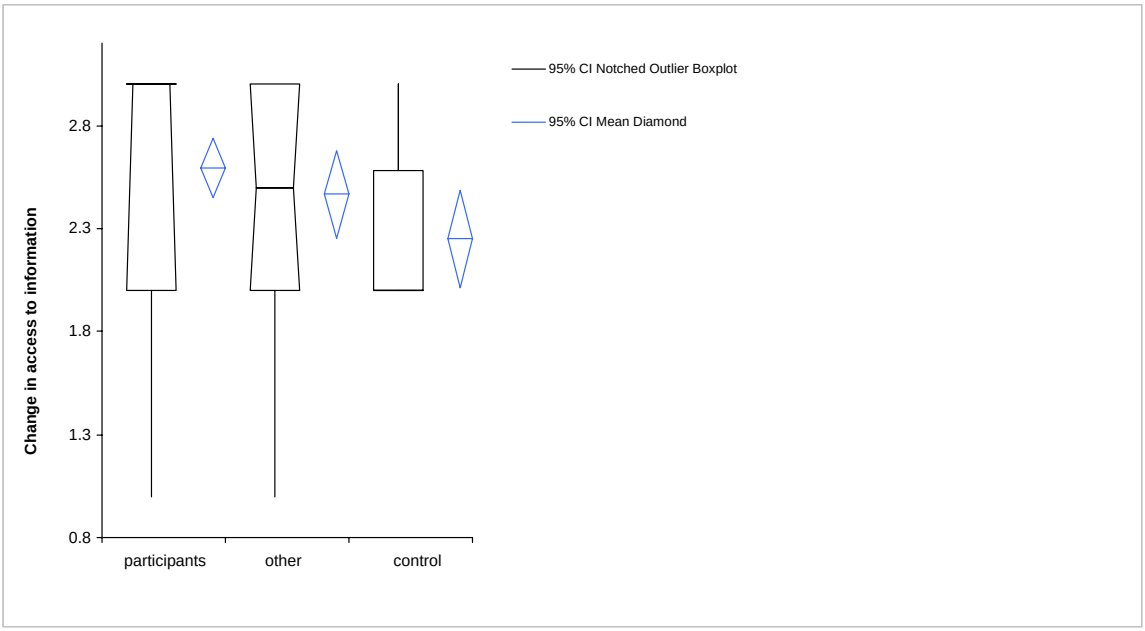
The cash available for purchasing inputs was perceived not to have changed for the participants and other residents, and to have decreased for the control group.

The participants, the control group, and the other residents all reported equal increases in their ability to send their children to school.

Only 11 of the 60 participants reported that they had received credit, from different sources. The average ability to borrow money was perceived not to have changed for the participants and other residents, and to have slightly decreased for the control group. However, there is large distribution in the answers; a third of participants reported decreasing possibilities to access credit and another third reported easier access to credit.

Access to information (on input and output prices, technology, and financial services) increased in all groups, with the highest increase for the participants.

Changes in access to information



1-decreased, 2-same, 3- increased

Eighty-two percent of participants reported that their success in implementing innovations had increased their enthusiasm to enroll in other activities, and 70% said that participation in AHI activities resulted in more involvement in new activities. For example, improved livestock led to use of animal manure, spring development encouraged livestock keeping, better tree management led to other conservation practices, and returns from banana led to investing in soil conservation.

Forty-two percent of participants had experimented with linked technologies, with 38% saying that their combined use had increased the adoption rate of some of the individual technologies. Some linked technologies mentioned by the farmers are:

- Crops with livestock management plus manure
- Tree management and river bank conservation
- Banana with coffee and trees (for soil conservation)
- Grass bunds and livestock (with zero grazing)
- Tree management and bee-keeping

Benefits that farmers cited as deriving from the use of linked technologies are the availability of cheap animal manure and diary products; improvements in soil fertility; and higher crop yields resulting in higher income from sales. The main constraints are: labor demand, required skills and time, limited cash, crop competition for light and nutrients (e.g., lower coffee yields due to shading from banana).

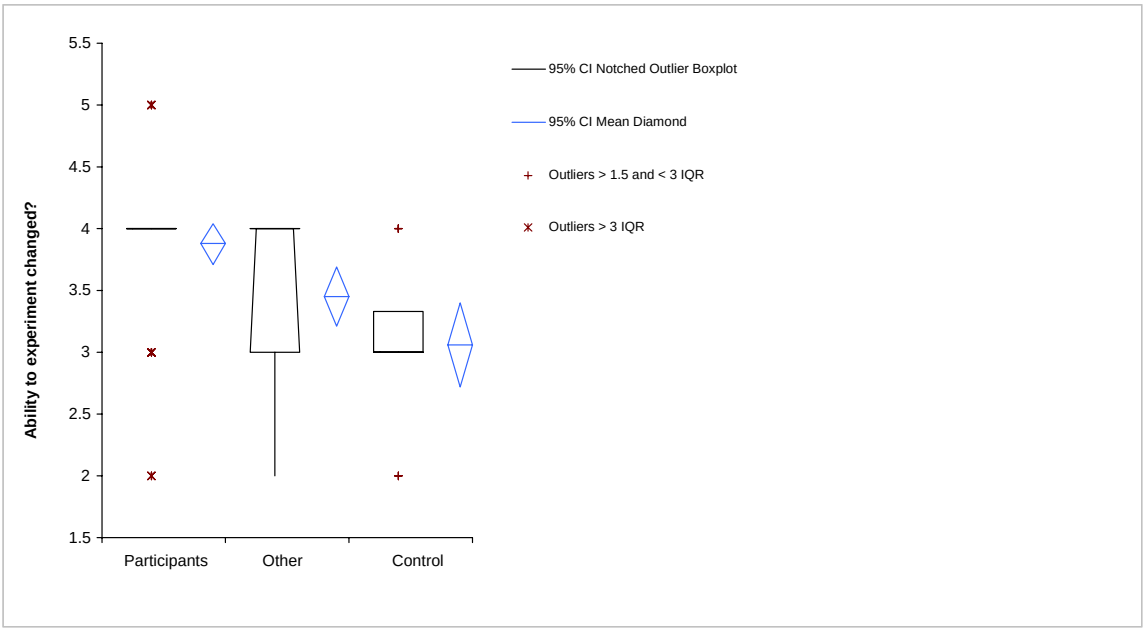
The participants in general perceived that improved NRM produced the most benefits (% of participants observing improvements on their farms given in brackets) in terms of:

- Improved productivity (85%)
- Control of water resource degradation (62%)
- Control of land degradation (83%)
- Improved negotiation of resource conflicts (48%)

- Increased knowledge of management practices (83%)
- Better water access (52%)
- Better water quality (68%)
- Better pest and disease management (57%)
- Equitable access to technology (87%)
- Decrease in water-borne diseases (15%)

The ability to experiment with new technologies was reported to have increased significantly for the participants and the other residents, while the control group reported no change.

Changes in the ability to experiment on owned/used land since base year



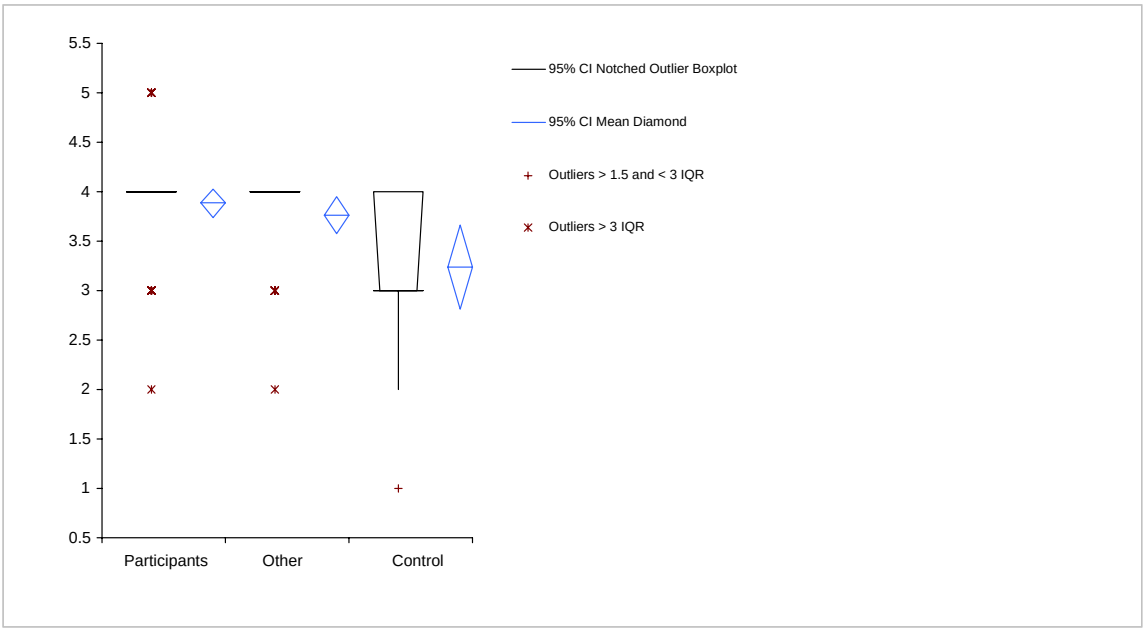
1-much worse, 2-worse, 3-same, 4-better, 5-much better

Seventy-eight percent of participants reported positive changes in their attitude towards participation; this increased only slightly for the other residents, and there was no change for the control group. About 38% of participants had been participating in social marketing innovations as labor pooling, capital pooling, and poultry rearing (collective actions).

In Kapchorwa conflicts occurred over the use of resources in Mt. Elgon National Park (between the local community and authorities), due to stray animals and people destroying grass bunds, among other things. Solutions were found through the application of relevant bylaws, thanks to increased awareness and community compliance. Forty-two percent of participants reported that AHI helped them to overcome conflicts (e.g., tree planting helped demarcate boundaries).

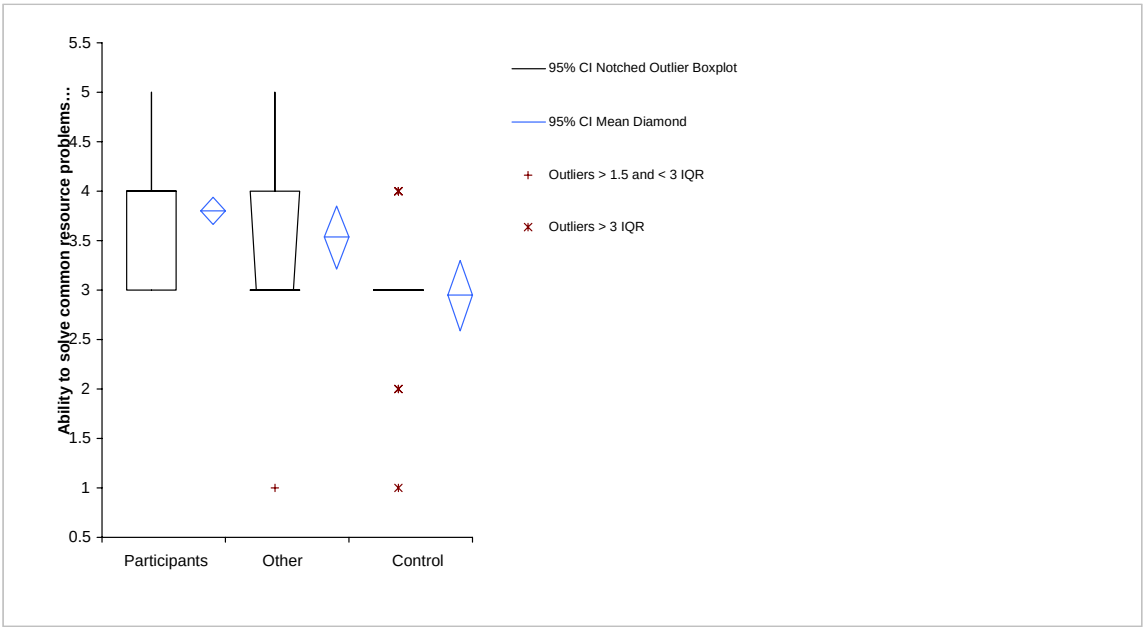
The tendency to cooperate on issues of common concern (e.g., collective action for NRM) and to solve common resource issues was reported to have increased significantly for the participants and other residents, while no changes were reported for the control group.

Tendency to cooperate



1-much worse, 2-worse, 3-same, 4-better, 5-much better

Ability to solve common resource problems



1-much worse, 2-worse, 3-same, 4-better, 5-much better

Eighty-eight percent of participants reported increased confidence in their ability to solve NRM problems, compared with 50% in the other resident group and 30% in the control group.

Ethiopia: Household Survey Findings

The survey instruments and designs for the household surveys developed by the ERIA team were used. Local consultants at the two sites, supported by AHI site coordinators and team members, conducted the surveys in December 2007.

A total of 105 households in Areka and 100 in Ginchi were interviewed. We highlight the findings of the household surveys in the following sections. Since the inception of AHI activities in Areka and Ginchi, farmers reported changes in a number of indicators and aspects of their livelihoods. This section presents highlights of the results. See Annex 3 for more details on findings, data, figures, and farmers' observations.

Areka

The general characteristics of the households interviewed are given below (Table 6).

Table 6 Household characteristics, Areka

	Participants N= 61	**Control N=21**	**Other Resident N=23**
Gender of Respondents (Male / Female)	52 / 9	20 / 1	17 / 6
Female headed households (% of total)	15	5	33
Average size of households (members)	6.74	6.45	5.04
Average age of HH heads (years)	41.66	39.45	37.8
Average age of the households (years)	20.03	19.20	19.15
Literacy of HH head (Illiterate/up to P4/P9/S)	22/ 10/ 12/ 9	8/ 3/ 6/ 2	8/ 10/ 3/ 1
Average land size owned (acre)	1.13*	0.97	0.65
Average owned assets (per households)			
• Plough sets / Carts	1.02/ -	0.62/ -	0.25/ 0.04
• Wheelbarrows / Borehole	- / 0.05	- / -	- / 0.04
• Spray pumps /Diesel pumps	0.02 / -	- / -	- / -
• Water tanks / Grinders / Hand hoe	0.08/ 0.10/ 2.48	- / 0.19/ 1.95	0.13/ 0.17/ 1.54
• Car / Motorcycle / Bicycle	- / - / 0.02	- / - / -	- / - / -
• TV / Radio / Mobile Phones	- /0.18/ 0.02	0.05/0.10/ 0.05	- / 0.17/ 0.04
• Beehives / Mosquito nets	0.30/ 1.48	0.10/ 1.29	0.63/ 1.08
Average number of animals (per households)			
• Bull/ Equines / Oxen	0.46/ 0.08/ 0.33	0.29/ 0.10/ 0.24	0.21/ 0.13/ 0.08
• Adult cows (improved/local)	0.13/ 1.02	- / 0.86	0.04/ 0.79
• Calves (improved/local)	0.10/ 0.95	- / 0.48	0.04/ 0.50
• Heifer	0.25	0.33	0.17
• Goat/Sheep	0.90	0.38	0.63
• Chicken	1.93	0.71	0.92
HHs with inadequate food security (% of HHs)	43	71	50

* One extreme value was excluded from the dataset

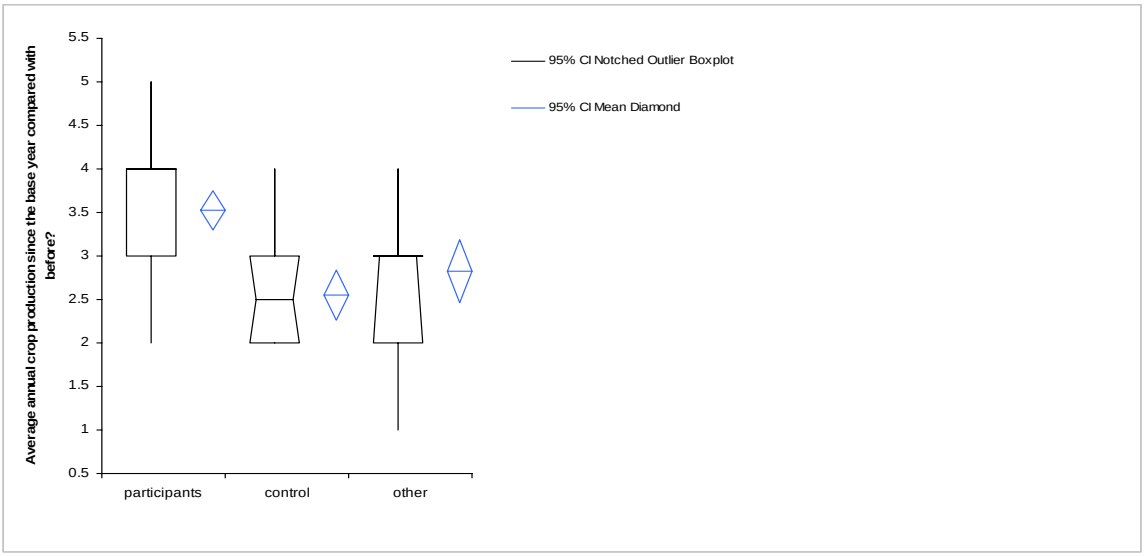
The most widely used new crop technology in Areka is taro (52 participants), followed by wheat (30). The most common crop is potato, although it was mentioned only by a few participants as a new technology. Positive features of the new varieties were ease of cultivation, good consumption characteristics, improved diets, better yields, adaptability, and ability to generate surplus grain for storage (an indicator of food security).

The three most popular technologies were improved seed (taro and wheat), soil conservation (bunds, terrace, forage grass), and porcupine control.

Crop production and yield were reported to have increased for the majority of the participants, while no change was reported for the other residents, and they were reported as

decreased for the control group. Access to quality seed increased for the participant and control groups, with no change in the other residents category.

Changes in crop production compared to base year

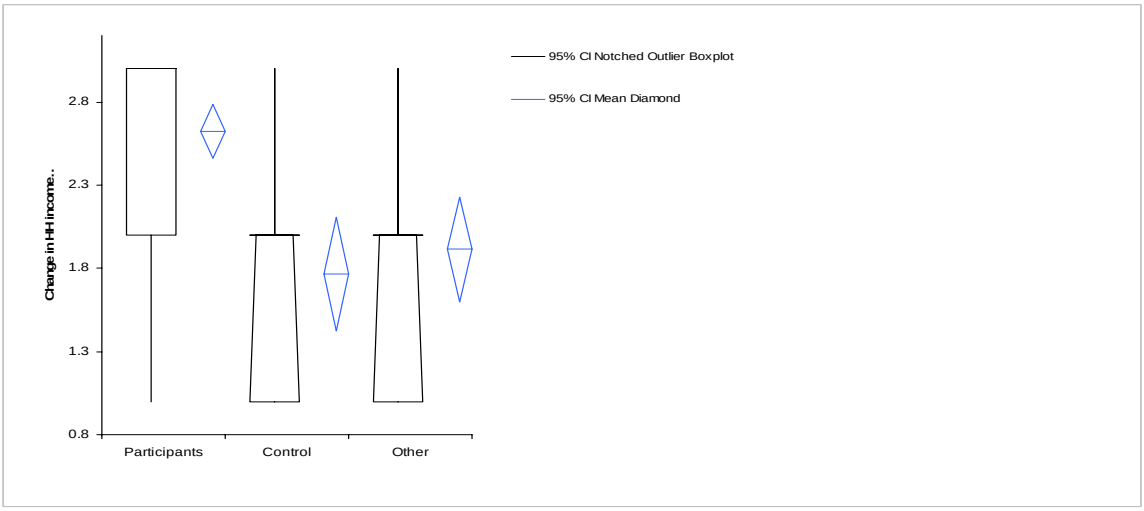


1-much worse, 2-worse, 3-same, 4-better, 5-much better
The base year for non-participants is 1996; for participants it is the year when they first participated in AHI activities (1996-1999).

The perceived drivers of change are: increased awareness and knowledge as a result of AHI interaction, and good harvests thanks to improved access to quality seeds at the market (an indirect effect). However, some participants were constrained by lack of cash, scarcity of seed suppliers, and late seed availability.

The income of the participants was reported to have increased significantly, while the control group's income decreased, and the other residents reported no change.

Changes in household income



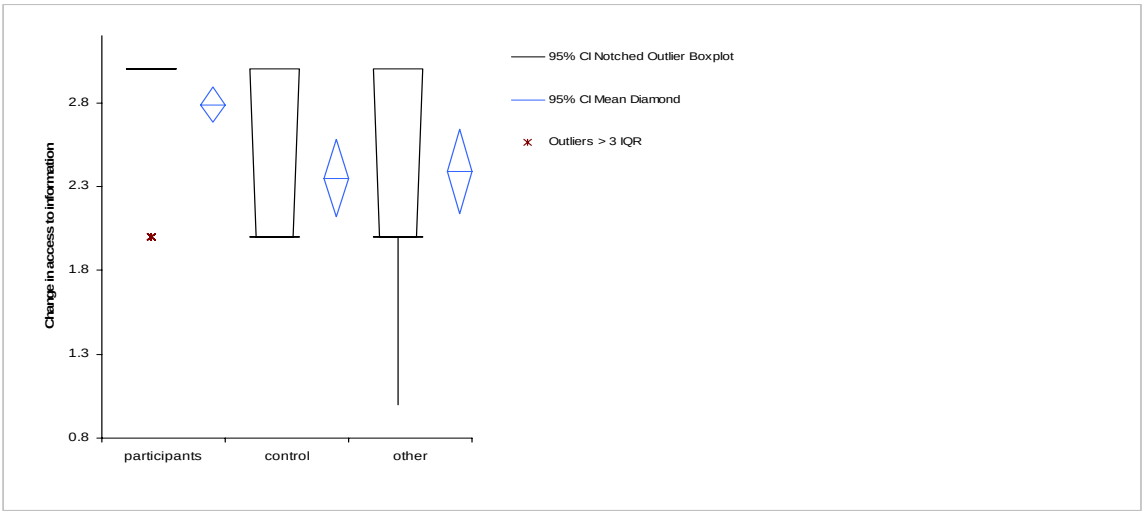
1-decreased, 2-same, 3-increased

The ability to send children to school was unchanged in the participant and control group, while the other residents reported slight improvement.

The capacity to borrow money was not reported as changed for the majority of farmers in all three groups, although some participants reported increased capacity, probably those benefiting from the seed credit scheme.

Access to information increased significantly for the participants, with a spillover effect observed for the other residents and the control group. Information access increased due to the information provided by AHI (e.g., on improved crop varieties) and collected from different sources (e.g., NGOs, AHI, Areka Research Center; visits by extensionists facilitated by safety net and government programs, the radio, and sharing of information through cooperative unions).

Changes in access to information



1-decreased, 2-same, 3-increased

Many participants started planting new trees for fruits, timber products, or for soil conservation purposes (e.g., Eucalyptus, Gradiya, Juniperous, Tid, Zigha).

Few participants owned improved livestock (bulls or poultry), but in the participant group local farmers reported that local livestock (cows, calves, oxen, goats, sheep, and chickens) had doubled since the base year.

A high percentage (84%) of participants reported that success in implementing innovations increased their enthusiasm to enroll in other innovations, while 44% reported that their participation in AHI activities induced them to enroll in other activities.

Success in planting improved varieties of taro and wheat enabled farmers to enroll in other technologies (e.g., soil conservation). Income generated from high-value technologies enabled farmers to invest in better soil management practices, such as bunds, terraces, and trees. Fifty-four percent of participants have been experimenting with linked technologies, 61% of whom stated that linked technologies lead to higher adoption of individual technologies.

The participants perceived that they received the most benefits from working with AHI on NRM issues such as (% of participants observing improvements on farm given in brackets):

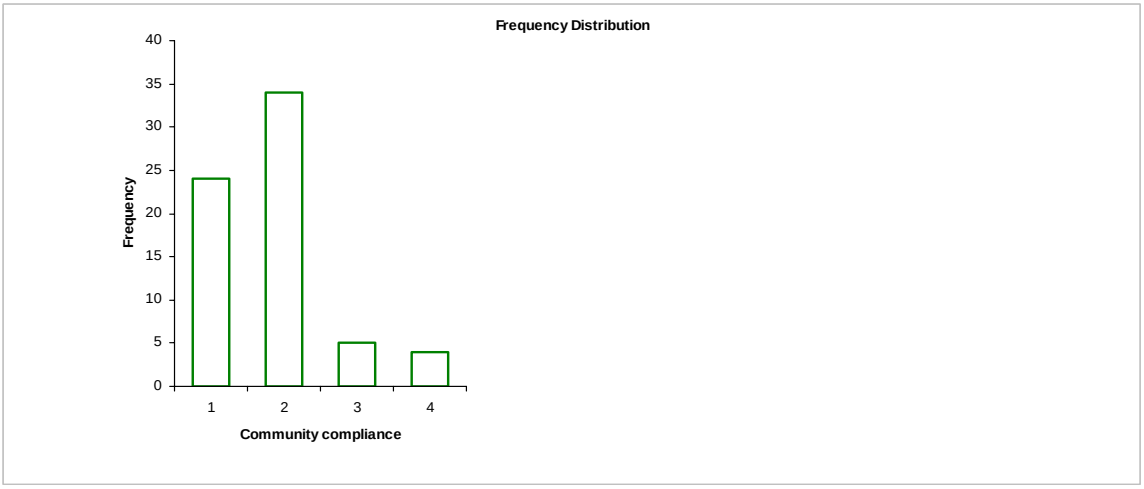
- Improved crop productivity (89%)

- Reduced water resource degradation (52%)
- Reduced land degradation (49%)
- Improved negotiations on resource conflicts (38%)
- Increased knowledge of management practices (74%)
- Better water access (61%) and better water quality (69%)
- Better pest and disease management (39% observed a change on their farms; 72% saw a positive change in the village due to community action on porcupine control)
- Decreased incidence of water-borne diseases (48%)

The participants report increased participation to collectively address productivity concerns since the base year. Thirty-eight percent of them took part in innovations such as labor sharing arrangements, porcupine control, spring development, and pooling products for better market access.

Community compliance with bylaws is very poor in Areka. Most respondents say that the majority does not comply, and many others say that nobody complies with bylaws. A minority of participants (~15%) say there is a tendency to be affected by bylaws. The other respondents reported positive or no changes.

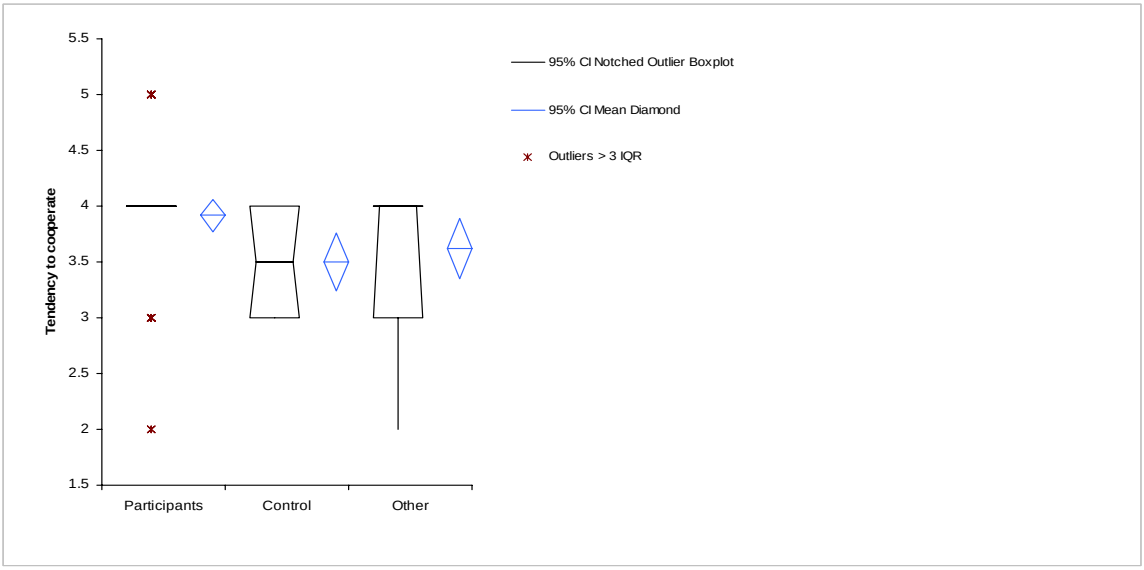
Community compliance with bylaws



1=no one complies, 2=minority complies, 3=majority complies, 4=everyone complies

The participant group showed a positive tendency to cooperate on solving common resource problems, especially form porcupine control initiated by AHI, which has involved the participation of entire villages, with spillovers to other residents.

Tendency to cooperate



1-much worse, 2-worse, 3-same, 4-better, 5-much better

Sixty-four percent of participants reported increased confidence in their ability to solve NRM problems, compared with 24% in the control group, and 35% in the other residents group.

Ginchi Table 7 below presents general characteristics and selected indicators for the sample households interviewed in Ginchi

Table 7 households characteristics

	Participants N= 45	**Control N= 35**	**Other Resident N= 20**
Gender of Respondents (Male / Female)	39 / 6	30 / 5	19 / 1
Female headed households (% of total)	11	14	5
Average size of households (members)	5.93	6.06	6.75
Average age of HH heads (years)	43.06	40.34	40.8
Average age of the households (years)	22.03	21.56	19.61
Literacy of HH head (Illiterate/up to P4/P9/S)	20/ 7/ 17/ 1	12/ 11/ 10/ 2	6/ 4/ 8/ 2
Average land size owned (acre)	3.1	2.67	2.73
Average owned assets (per households)			
• Plough sets / Carts	1.02/ 0.18	1.09/ 0.20	1.15/ 0.15
• Wheelbarrows / Borehole	0.02/ 0.11	- / -	- / 0.10
• Spray pumps /Diesel pumps	0.04/ -	- / -	- / -
• Water tanks / Grinders / Hand hoe	- / 0.13/ 1.31	- / 0.11/ 1.20	- / 0.05/ 1.65
• Car / Motorcycle / Bicycle	- /- / -	- /- / -	- /- / -
• TV / Radio / Mobile Phones	- / - / 0.02	- / 0.66/ -	- / 0.70/ 0.05
• Beehives / Mosquito nets	0.16/ -	0.29/ -	- / -
Average number of animals (per households)			
• Bull/ Equines / Oxen	0.71/ 1.11/ 0.84	0.57/ 1. 40/ 1.17	0.5/ 1.25/ 1.1
• Adult cows (improved/local)	0.04/ 1.04	- / 1.37	- / 1.35
• Calves (improved/local)	0.02 / 0.73	- / 0.89	- / 1
• Heifer	0.18	0.17	0.15
• Goat/Sheep	4.38	4.51	6.15
• Chicken	1.42	1.31	1.4
HHs with inadequate food security (% of HHs)	31	26	30

The three best (and most popular) technologies in Ginchi are potato (reported by 74% of participants), springs (39%), and linseed (18%). Linseed is quoted as the most important cash

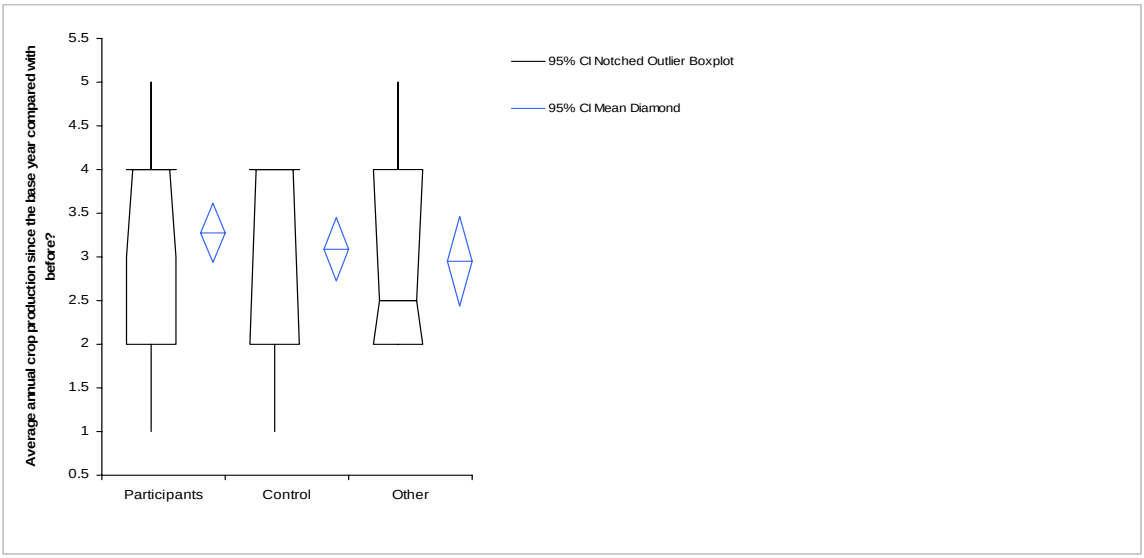
crop, with high yield and good market price; it generates income for many families. However, it was reported not well suited to all soil types.

Potato was successfully introduced in Ginchi, with spillover effects to non-participants. Positive impacts of potatoes mentioned by households are that it solved food security problems and improved livelihoods, as potatoes have good market prices, high yields, and are resistant to frost and diseases. Potatoes provide sufficient food for consumption and to generating income.

In the participant group 93% used improved crop variety (potato), 78% used improved cash crop (linseed), 80% planted new trees, 47% used new crop management practices, 29% reported improved pest management, 67% used soil conservation practices, 27% used fertilizers, 16% used animal manure, 60% used compost, and 89% were involved in spring development. Farmers associate these technologies with AHI.

Average annual crop production compared with before the base year increased marginally for the participants (more than half perceived a positive change, while about 40% perceived declines); there was no change for the control and other residents.

Changes in crop production compared to base year

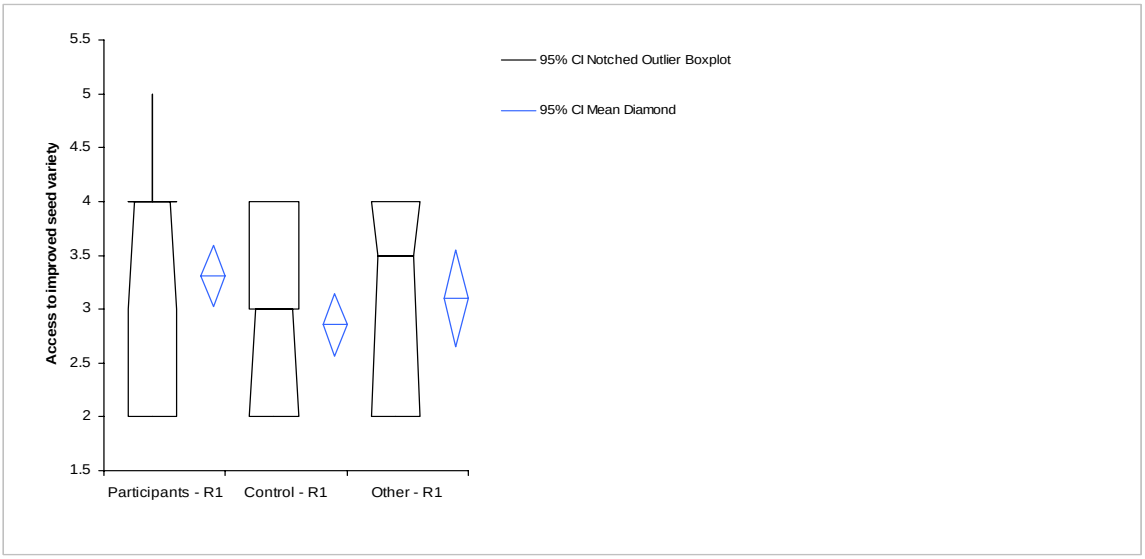


1-much worse, 2-worse, 3-same, 4-better, 5-much better
The base year for non-participants is 1994; for participants it is the year when they first participated in AHI activities (1994-1998).

Reasons mentioned for improved soil fertility are: awareness of new technologies and inputs used with different crop management systems and soil management practices; use of improved varieties with appropriate sowing rate, fertilizer use, investment in productive assets, productive area increase, good weather, soil bunds to control water, and training and advice from AHI. Equal numbers of participants observed increases and decreases in yields; therefore the average value shows no change.

There was increased access to quality seeds in the participant group, a marginal increase for the other residents, while no change was observed for the control.

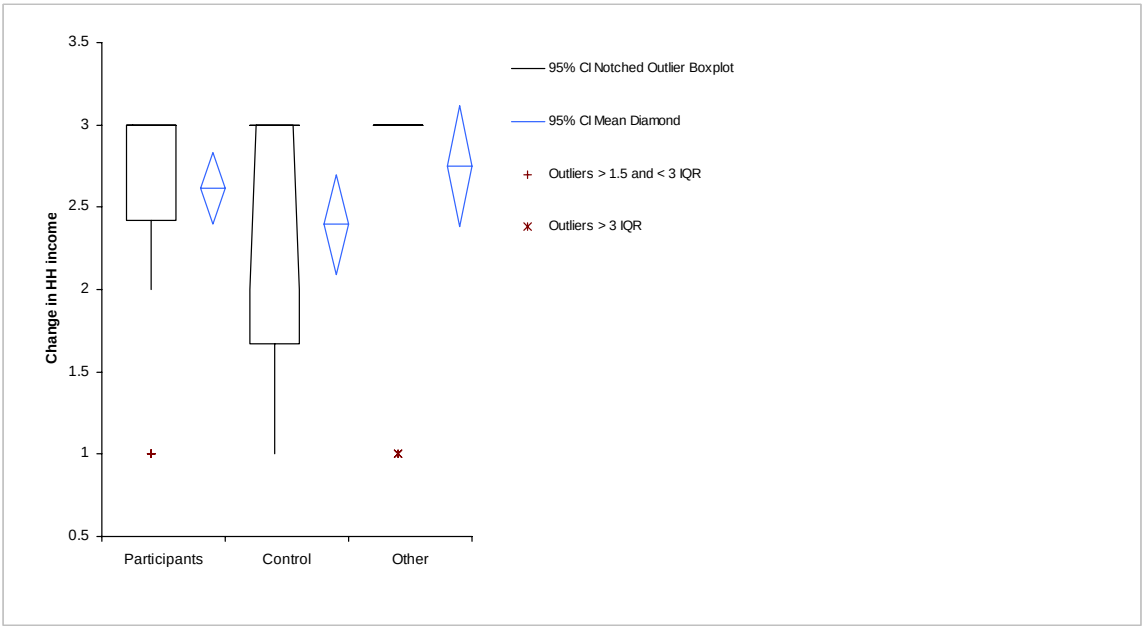
Perceived changes in access to quality seeds



1-much worse, 2-worse, 3-same, 4-better, 5-much better

Household income increased for all groups, with the highest increase in the other residents group, followed by the participants.

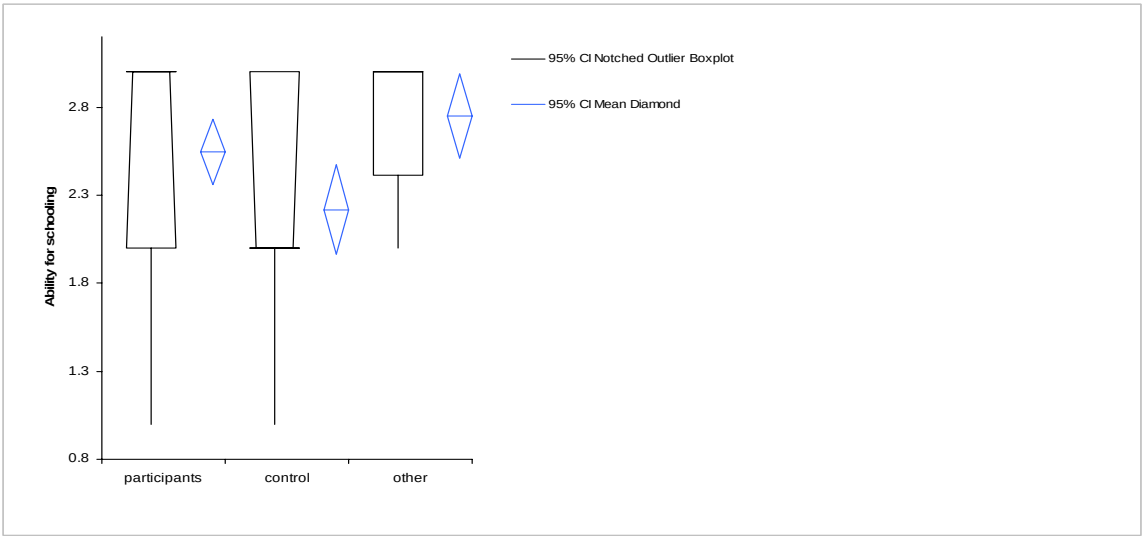
Changes in household income



1-decreased, 2-same, 3-increased

The ability to send their children to school increased for all three groups; the highest increase was observed in the other residents group, followed by the participants. The control group experienced a slight increase.

Changes in the ability to send children to school



1-decreased, 2-same, 3-increased

Access to information increased in all groups, with the highest increase in the participant group. Different types of training were received by the participants: on soil and water conservation, crop management, compost making, nurseries, raising seedlings, potato, linseed, apple, and spring management, among others.

AHI had significant impact on spreading awareness of tree management for conservation agriculture. Eighty percent of participants planted new trees (compared with 0% in the control group), with the dual purpose of improving soil management and benefiting from fruit or timber production. One farmer mentioned that exchange visits to observe the success of other farmers influenced his decision to apply AHI technologies.

Mineral fertilizers improve yield, but are expensive. In the participant group, there was a major shift from mineral fertilizers to compost. Animal manure and, especially, compost were received as economical substitutes for mineral fertilizers. However, they are reported to be not as easily applicable on a large scale, difficult to transport, and labor intensive.

All participants were fully aware of tree compatibility in the proximity of springs, compared to only 65% of the control group and 70% of the other residents. The average time spent fetching water decreased by about half for the participants.

Spring development is recognized as one of AHI's most important contributions to improved livelihoods. Eighty-nine percent of participants were actively involved in spring development, with 80% reporting positive impacts on health, on the quality of drinking water, free of water-borne diseases, and decreased need for medical care.

Eighty-two percent of participants reported that success in implementing early innovations facilitated by AHI increased their enthusiasm to enroll in other activities. Spring development and success with potato varieties encouraged farmers to make other investments. Cash generated from potato sales allowed them to buy fertilizers and experiment with other cash crops (linseed, vegetables). Spring development helped farmers to start animal rearing. The success of compost application on potatoes was reported to have encouraged farmers to apply compost on other crops.

Most participants reported that they experiment with linked technologies, including:

- crops (potato, linseed) with soil bunds
- crop with soil bunds and nitrogen-fixing trees
- crop diversification with soil bunds (breaking monoculture)
- crop(s) with mineral fertilizers or compost
- crop(s) with appropriate sowing rates (and spacing)

The participants in general perceived the most benefits from addressing NRM issues (% of participants observed improvement on their farms) such as:

- Increased knowledge of management practices (87%)
- Better water access (87%) and better water quality(87%)
- Improved productivity (80%)
- Reduced water resource degradation (69%)
- Better pest and disease management (58%)
- Reduced land degradation (53%)
- Improved negotiation on resource conflicts (40%)

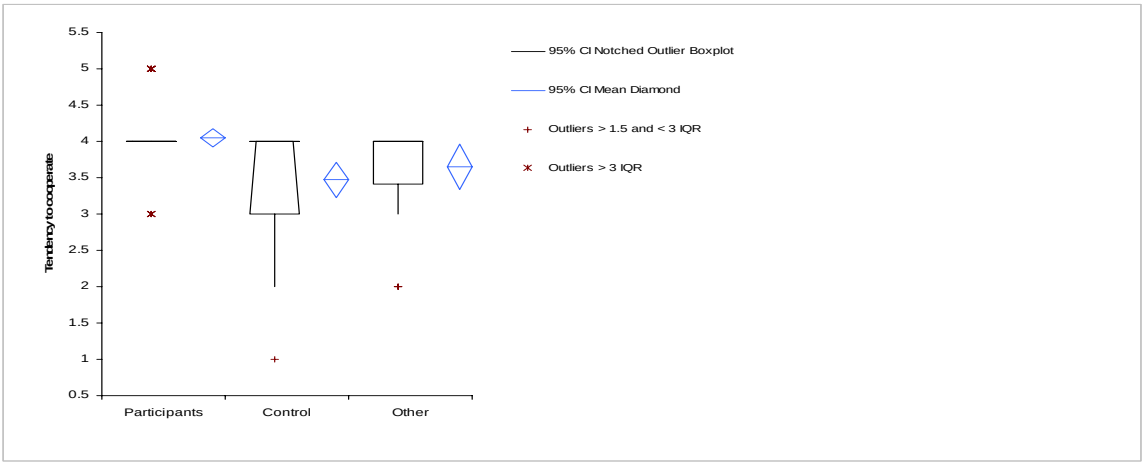
The participants reported a higher capacity to experiment with technologies by themselves. Success with potato or linseed provided the cash, while AHI provided the knowledge. The control group did not report any change.

There was a reported improvement in the attitude towards collectively addressing production concerns in the community since the base year. Eighty-seven percent of participants took part in marketing innovations (e.g., gathering output and taking it to market together; seed sharing; exchanging improved seed; pooling inputs and sharing the dividends; participating in potato growers groups to access new varieties; being part of mutual help groups for harvesting; building terraces together; collaborating on tree nursery management; collaborating on spring development and maintenance; building schools, maintaining roads). The greatest benefits of participation in organizations were access to inputs (seeds, fertilizer), training, knowledge, and sanitation.

AHI had important effects on solving some conflicts in the community, such as: free grazing (reportedly half of all households and 26% of participants experienced crop damage due to free grazing), planting eucalyptus trees around springs; use of the spring (to keep animals from drinking the same water); and poor participation in constructing bunds and terraces. Bylaws were established on spring management, nursery management, soil and water conservation, among others. Community compliance with bylaws was reported to be good in general.

The tendency to cooperate and the ability to solve common resource-related problems increased in all groups, with the highest increases in the participant group, followed by the other residents.

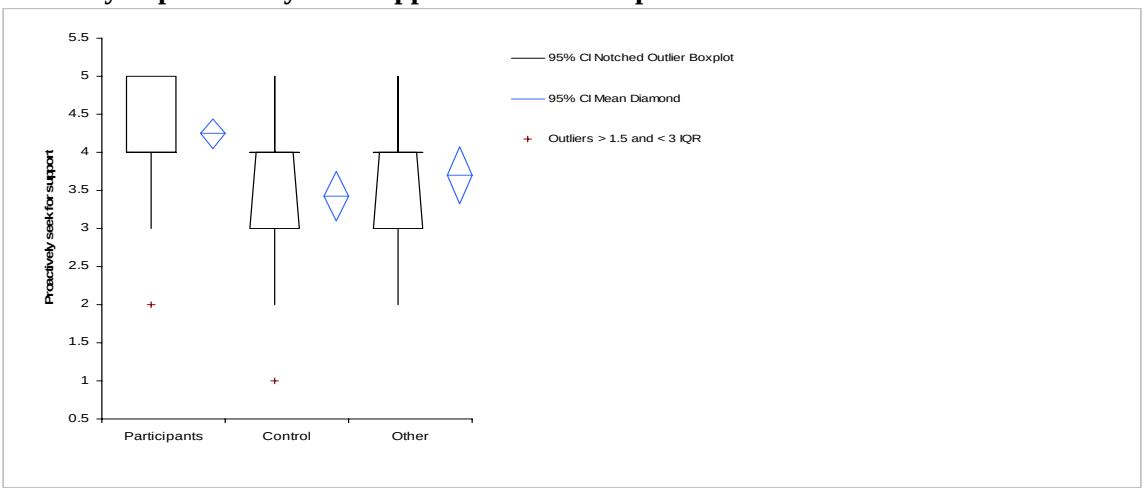
Tendency to cooperate



1-much worse, 2-worse, 3-same, 4-better, 5-much better

The tendency to proactively seek support from service providers increased significantly for the participants, with spillovers to the other residents, and positive changes also in the control group. Eighty-two percent of the participants reported having increased confidence in their ability to solve NRM problems.

Tendency to proactively seek support from service providers



1-much worse, 2-worse, 3-same, 4-better, 5-much better

The preceding sections presented evidence-based impacts, as reported by the sample of households included in the survey. The analysis further confirmed most of the findings identified by the FGDs and stakeholder interviews.

In general positive impacts were observed in all sites in terms of improved crop production, increased income (mostly from agriculture), training, and empowerment. In all sites higher impact was observed in the participant group, followed by the other residents or “spillover” group, compared to the baseline control group. Different levels of spillover effects were observed in the sites, e.g., clearer spillover effects were observed in Kapchorwa, because the other residents were selected from the same villages where AHI was present, while in other sites they were selected from nearby villages. Similar patterns can be observed in terms of outcomes, such as the tendency to participate in collectively solving NRM issues, compliance with bylaws, and enthusiasm for testing and adapting new technologies.

5. Summary, Lessons and Recommendations

Strengths, Weaknesses, and Lessons from the ERIA

Despite that AHI's original design was not to demonstrate direct impacts on livelihoods at the plot, farm and landscape levels but rather to develop and test INRM methodologies to be used by others to scale out/up NRM technologies in the ECA region, there is evidence of impacts and spillovers on lives and landscapes. AHI has also shared lessons on methods, contributed to institutional outcomes, and influenced how INRM agendas are developed and funded.

AHI's key strengths, impacts, and achievements

The ERIA puts forth the following key findings on AHI's main strengths, impacts, and achievements, and indicates aspects on which, in our view, there is need for improvement. We also point out some lessons and suggest that AHI considers those aspects for the future.

STRATEGY AND OBJECTIVES, THEMATIC PROGRAM APPROACH

1. An effective participatory way of working with farmers through action research, recognized by both farmers and key stakeholders. This is related to a general capacity to address, from the bottom-up, the main entry points raised by farmers.

2. Appropriate application of NRM technologies through AHI-developed methods and adaptation of approaches to the local context. This has enabled the stakeholders to understand the complex nature of INRM and improved the learning process, leading to greater adoption of the approach itself.

3. One strength of the program is related to AHI strong commitment to NRM; informal capacity building of partner institutions and scientists; advocacy for change in research approaches; influencing other actors (e.g. the Sub Saharan Africa Challenge Program); consolidation of system components and their relationships; and the ability to influence communities using social science and participatory tools.

OUTCOMES AND IMPACTS

4. Clear impacts at the participant household level and outcomes at the level of local institutions in the sites (especially in terms of adopting the approach and changing mindsets and attitudes towards research, principally at the grassroot level and, in various cases, at the institutional one; and in terms of facilitating the understanding and adoption of natural resource management), as well as various local spillovers to non-participants (refer to details in the household survey and FGD results).

5. Successes in building the capacity of stakeholders in different areas (e.g. farmers more readily recognize and solve NRM issues, communities solve conflicts in participatory ways, farmer institutions such as FRGs are empowered); this has often been driven by the needs of local stakeholders, end users, farmers, and institutions.

6. There is awareness and appreciation of watershed management, in particular, and INRM, in general, among many high level officials, leaders of institutions, and policy makers.

7. Through AHI, stakeholders see that INRM works, and effectively! This is thanks to good interaction between AHI's biophysical and socio-economic components, and to a community driven approach. The capacity to put INRM to work is a rare achievement within CGIAR centers. This was facilitated by long-term investments by AHI donors and the commitment of the host institution, both necessary for testing long-term innovations.

8. The fact that AHI has been (and is) a think tank for developing tools and methods, and has facilitated the institutionalizing of INRM at the regional level.

9. The institutionalization of the INRM approach is taking place (though at different speed and effectiveness) across sites and countries where it faces diverse local challenges. This has been supported by facilitation of local level networks and the engagement of different types of stakeholders through training and dissemination.

10. The process of disseminating AHI outputs, successes, and methods is fairly good at the international level, especially through a rich webpage. Training at the local and regional levels was often mentioned as an example of successful AHI activities.

11. AHI contributed to the conceptual design and development of the SSA Challenge Program now in progress in three pilot learning sites in west, eastern and central and southern Africa. Additionally, AHI has provided technical backstopping in the selection of these sites, development of tools for baseline data, participatory monitoring framework and strategies for establishment of innovation platforms. It has also shared its experience, knowledge, and products with other CGIAR centers.

PROGRAM MANAGEMENT

12. Participatory monitoring and evaluation systems used by AHI have normally ensured good staff performance and timely delivery of quality outputs at various levels (community, site, national, regional), although their wider application has been restricted by available funds.

13. Institutional partnerships fostered by AHI bring together experts with different background in the site team. The use of multi-disciplinary and multi-institutional research teams at benchmark sites in each participating country enhances testing relevant social and technological systems / approaches to resolve agricultural productivity and environment management problems.

Aspects to be improved / lessons learned

STRATEGY, OBJECTIVES and THEMATIC APPROACH

1. The participatory way of working with farmers through action research, while allowing AHI to address the many entry points raised by farmers, also carries the risk of overstretching the activities and capacity for addressing NRM issues.

2. Given the overall success of the program, the length of the investment, that phases I and II were of a preparatory type, and that activities started in different areas at different times, the scale of program interventions appears to be too limited geographically; local spillovers exist, but little is found beyond the watersheds.

3. Program activities and work themes seem not to have clear boundaries and in general have a limited focus. The process for adding new areas of work to program activities is not fully clear to the ERIA as well as to various stakeholders. This risks overstretching and reducing the effectiveness of the limited resources.

4. There has also been some imbalance between social and biophysical sciences in recent years, challenges in selling the approach beyond the current sites and participating actors, and to move out of the traditional sites; limited writing of influential papers, and to write convincing proposals to obtain large grants.

OUTCOMES AND IMPACTS

5. The dissemination and publicity of AHI's work and approach are satisfactory at the international level but appear to be limited at the national and local levels, based on the ERIA field visits, at partner institutions, etc. Therefore, AHI’s national visibility is limited.

6. Given AHI’s long-term involvement and focus on approaches, the CGIAR expects more IPGs in the form of quality, peer-reviewed international publications. Despite a huge amount of AHI publications and briefs, especially on the website, there are few peer-reviewed journal publications, and these tend to originate from very few authors. Increasing the role of local co-authors in scientific outputs is suggested.

PROGRAM MANAGEMENT

7. Several partners are not fully clear on where AHI belongs: a CGIAR-wide initiative, or does it belong to ASARECA, or is it an international NGO? This gives partners different expectations and at times confuses them. AHI’s eco-regional system-wide status or profile is not clear as most perceive it mainly as an ICRAF program. This is further confounded by the limited participation of other IARCs in AHI’s research portfolio. How to bring these players on board is a challenge for the future of AHI.

8. The definition and functioning of site teams, their cost and composition are not fully clear to all players. There may be too many researchers on board, when at times more extensionists may be needed. Incentives to collaborators (for non core site team members) should be strengthened in order to secure that they allocate their time in AHI activities. It is also reported to be expensive to mobilize entire teams.

Conclusions and Recommendations

The ERIA proposes the following recommendations for consideration or action by AHI.

STRATEGY, OBJECTIVES and THEMATIC APPROACH

1. Building on its most specialized and recognized strengths, i.e., the capacity to foster and catalyze partnerships, to conduct participatory research effectively in order to identify and promote INRM technologies that meet the needs of local users, and to facilitate actions by key local players.

2. Investing more in local scientists and organizations so to ensure the sustainability of the process AHI promotes, and to be able to build strategies and modalities for successful future "disengagement" and out-scaling strategies with its partners.

3. Strengthening and seeking institutional partnerships to influence policy formulation and linkages to enhance INRM in collaboration with ministries of agriculture and environment, and local governments. AHI should also seek new partners in its key priority areas (e.g., ASDP in Tanzania).

4. Developing its main themes and priorities with farmers and other beneficiaries based on site demands and perceived needs. This is already occurring to a good extent, but not always or always effectively, yet it is crucial to AHI's success in line with its aims and participatory way of working. In general, INRM needs may be similar, but there are also site-specific needs that must be captured and addressed.

5. Reviewing the criteria used when deciding which new areas of work to tackle (or not), to guide its choices through a systematic and participatory process at different stakeholder levels. In this way AHI will be more targeted, and its focus less prone to criticism. This will also allow AHI to operate within rather general or (naturally) evolving boundaries of work.

6. The success of AHI and its up/out scaling depend on the collaboration with different partners. When its partners face difficulties or restructuring AHI's work is affected. AHI should consider and be better prepared to face partners' changes. We suggest that other players should also get on board (e.g., extension, NGOs, other IARCs).

7. Shifting its priority focus (as perceived by the ERIA and stakeholders in the current phase IV) *from* research on methods and approaches, *to* more work in the future on INRM options for farmers and to out-scaling the approach. While it is recognized that approaches and methods go hand in hand with INRM technology adoption, and that AHI should keep researching on methods [10], the balance may need to change.

8. Developing a (short) list of "flagship products" needed to clarify externally its areas of work and what it aims to deliver (identify potential regional/international public goods to be developed). AHI should have (and publicize) a "road map" showing the

[10] A suggested new research area is how to build effective, sustainable "disengagement" or out scaling strategies that work. A research model on this that would fit AHI was proposed by the ERIA during the workshop

process of INRM integration and institutionalization that will lead to positive impact /outcomes. We suggest that impact pathways be analyzed, designed, and publicized.

9. Many stakeholders indicated that the supply of NRM technologies is limited. There is a need for AHI to assist and backstop NARS to conduct even more adaptive and validation type research to supplement the methods research that AHI is engaged in.

10. Clarifying and monitoring how the ongoing entry points and linked technologies impact and influence the development, wider diffusion, and enhancement of INRM.

PROGRAM MANAGEMENT

11. Attempting to broaden its donor base. Having just a few donors, however open minded and innovative in giving long-term support, is risky. AHI should also devote efforts to broadening local-level (national, district) sources of funding to ensure the sustainability of the program.

12. Improving the timeliness of the sourcing of funds from donors and of the release of funds to its different activities (especially field activities, to be available when agricultural calendars require them). AHI should also be proactive in assisting and enabling its NARS and local partners to broaden their capacity to seek national funding (as for the FARM Africa and Land care proposals in Tanzania). AHI may also consider providing training on proposal writing and negotiation skills.

INFORMATION MANAGEMENT

13. Improving and expanding its dissemination and publicity efforts at the national and local levels by reaping the opportunities that are offered by modern dissemination technologies; build on its own good experiences (e.g. the Telecenters); and enhance the exchange of its players also at the lower levels (through more farmer visits and exchanges, also transnationally). Specific suggestions on how to enhance the role played by the webpage and to improve its use are given in the report.

14. Improving the internal information flows from its leaders to its grassroots members, and vice versa.

15. Increasing the publicity of the approaches and interventions at different scales, and clarifying to new and external viewers what AHI was / is / will be doing, and how different activities, sites, themes, technologies, and approaches are linked together.

SCALING OUT OUTCOMES AND IMPACTS

16. AHI has had tangible impact on the livelihoods of participants and, in some cases, of other farmers at the sites, and several intended positive outcomes on farmers and partner institutions. It is conceivable that, especially in the ‘older’ sites or countries, AHI may have already started out-scaling to reach more stakeholders in the current phase. In any case it is a good time for AHI to start upscaling and mainly outscaling (geographically) its methods and approaches by building on its partnerships in the next phases. AHI should articulate how it will scale-out its methods and approaches.

LONG-TERM STRATEGY

17. Given its eco-regional mandate, experience, achievements, and key strengths, AHI might develop into a center of excellence in INRM. The ERIA thus recommends building a “hub style” regional coordination and management structure; this needs to be cost effective and highly technical if it is to play such an important role.

18. Finally, the ERIA suggests to AHI a possible trajectory to be followed during the next 3-10 years, for consideration and reflection. As AHI’s comparative advantage lies in its implementation of “INRM that works,” the evolution of the program is towards a center of excellence on INRM, that other centers—in and outside the CGIAR—international organizations, NGOs and national institutes can refer to in order to initiate and implement successful INRM approaches. The failure or partial successes of others to implement INRM effectively, while offering elements for reflection on AHI’s strengths (and continuing risks), de facto opens for AHI - and its potential evolution into an INRM center of excellence, a market niche for which there is increasing demand, and an opportunity to fill what is in fact a vacuum.

This trajectory envisions that AHI could:

1. ‘drop’ the ‘H’ within the next 3-5 years, meaning that its scope and comparative advantage could easily span beyond the Highlands
2. ‘drop’ the ‘A’ within the next 5-8 years, meaning that the scope of its work and comparative advantage will reach beyond the African context
3. while strengthening the focus on the ‘I’, to become synonymous of ‘I-NRM’.