Report on AMAREW Project

Internal Evaluation by RIT

(121206)

August 04-13, 2006

Cover Picture

Sekota WOARD staff and AMAREW Project Watershed Management Advisor giving explanations to the RIT evaluation team on achievements at the Yeku watershed

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Executive Summary: RIT Internal Evaluation of AMAREW Project

1. Background

The Amhara Micro-enterprise development, Agricultural Research, Extension and Watershed management (AMAREW) Project is a USAID/Ethiopia Mission funded initiative established in July 2002 to provide technical assistance in integrated agricultural development in the Amhara National Regional State (ANRS). The Project works to strengthen agricultural research, extension, watershed management, capacity building, and micro-enterprise development in the ANRS by working with its ANRS partners in strategically selected three pilot watershed sites and eight pilot food-insecure Woredas. The Project is being implemented by a Virginia Tech led Consortium (Virginia Tech, Cornell University, Virginia State University and ACDI/VOCA) in collaboration with its ANRS Primary Partners consisting of the Food Security Coordination and Disaster Prevention Office (FSPCDPO), Amhara Regional Agricultural Research Institute (ARARI), Bureau of Agriculture and Rural Development (BoARD), Environment Protection, Land Administration, and Utilization Authority (EPLAUA), Amhara Micro and Small Industries Development Bureau (AMSEIDB), and Amhara Credit and Saving Institution (ACSI). The technical advisors of AMAREW, one for each component mentioned above, work with and advise their respective line department experts in all stages of project activities.

An internal evaluation of the activities of the AMAREW Project was conducted from August 03 to 12, 2006. The active members of the RIT representing FSPCDPO, ARARI, BoARD, EPLAUA, USAID, and AMAREW as well as an additional USAID representative and the Project Advisors took part in the evaluation.

2. Farmers and WOARD assessment of the AMAREW project

In Lay Gayint, the AMAREW Project introduced several useful technologies for farmers' use. Mention could be made of the Washera type sheep with demonstrated rapid growth compared to the slow growing small size sheep locally known as Farta type sheep. The different improved crop varieties introduced based on farmers' assessments have also shown fast growth, good response to overall crop management, and better yield.

Major contribution of the Project in watershed management is the rehabilitated watersheds visited by the evaluation team. The community and WOARD consider this a lasting and sustainable contribution as it determines the future well-being of the community.

Due to the interventions of the AMAREW Project, livelihoods of community members in the kebeles of the project's involvement are improving. Improvement is recorded particularly in livestock holdings (goat, apiary) and natural resource and water conservation.

The Project has also improved the communities' access to clean potable water and water for the livestock.

There is a widespread understanding that Research-Extension (R-E) linkages are useful to better respond to small-scale farmers' needs. But due to commitment and follow up failures from all side, strong R-E linkage has not occurred. AMAREW has organized and facilitated workshops (planning and implementation) and has developed Memorandum of Understanding (MoU), which was signed between WOARD and the ARARI research centers.

We highly value AMAREW's approach of engaging the WOARD and the ARARI Centers to fully assume responsibility of field level implementation as it ensures sustainability of Project achievements and empowers local staff and community to lead future development efforts.

AMAREW is beneficial to each woreda in various aspects, including building our capacity physically and, building the capacity of our work force, has introduced R-E approaches that lead to better outputs in watershed management (community empowerment) and adoption of technologies (on-farm experimentation), has introduced several technologies that meet needs of rural communities, etc. Although the Project is working in a few pilot communities it has demonstrated spillover effects to non-target communities as well.

All joint planning review schedules (Research-Extension to be supported by AMAREW) have to be done earlier than ARARI's annual review schedule. There is no harm for AMAREW to conduct its joint planning workshops earlier than December of each year.

The physical water harvesting structures observed by the evaluation team at Yeku and Lenche Dima are impressive. With such water harvesting structures in place, it can be concluded that the amount of run-off has already diminished and water table recharging has increased. The ponds and water harvesting structures developed thereof should be used for high value vegetable and fruit crops development.

The restricted manufacturing and use of the fuel-efficient stoves in Yeku made one of AMAREW's success stories but so far it is restricted to one Kebele alone. Only 58 HHs out of approximately 1000 or 6% are using such stoves. DAs were trained by the regional Energy Bureau to train and assist communities to manufacture and use energy saving stoves. The woreda and the Zone have to join hands and facilitate scaling-up of the technology.

The evaluation team has noted the reduced attention given to periodically evaluate the performance of the AMAREW Project. Monitoring and evaluation is a no choice option to note if projects are performing as planned and moving towards achieving the planned goal.

Generally the evaluation team said that it was impressed with the achievements at the pilot watersheds. The team however recommended that all stakeholders, meaning the community, Kebele leadership, concerned sector organizations should work together towards the watershed development. The team further recommended the development of watershed management bylaws to ensure sustainability of achievements.

3. Community members' assessments of AMAREW's interventions

In Lenche Dima, AMAREW has introduced community centered watershed development, which brought about an observable change in the watershed. Lenche Dima was a highly degraded site characterized by extremely high erosion and extended gullies. Due to area closures and gully treatments, increased canopy coverage resulted from enhanced natural vegetation regeneration and due to tree plantings. Run-off has been controlled and the effort is showing signs of increased moisture infiltration and rising water table.

Innovative inhabitants of the watershed are now engaged in small-scale vegetable and lowland fruit production using harvested rainwater stored in the wide spread dome shaped structures. Due to shortage of water and knowledge such activities were unknown in Lenche Dima earlier and all are outputs of the Project.

The Project's approach including (1) empowerment of the community to lead the watershed development efforts, (2) allocating treated land to individual community members under a usufruct right, (3) working through the WOARD, (4) requiring the allocation of a separate DA to follow on Project activities, (5) efforts to integrate high value crops (mango, papaya, cabbage, etc.) are all new to the area which motivated the community members to move forward with the Project.

4. Improving FREG organization and furthering improved varieties

The evaluation team observed that the organization of FREGs has to shift from permanent membership to one, which is time-bound and generates followers within a specified time period. For example, first level beneficiaries from FREG operation may stay for two years and then should organize second level beneficiaries who will operate for the same length of time and then move on to organize other FREGs. This is one mechanism to disseminate new technologies introduced through FREGs and extends benefits from new technologies equitably among community members. It is also a way of scaling-up the technologies to bring a meaningful and widespread impact.

Improve the organization of the FREGs to include all stakeholders (PA leaders, DAs, Development Committee members) and for technologies to cascade to none FREG members. As much as possible link AMAREW's interventions with the Safety Net Program in each woreda, since AMAREW is a food security project.

Promote validated technologies to more farm HHs. FREGs make sense only when technologies are further disseminated to reach other farmers. In this connection, WOARD should document and hold quantitative data for all the interventions. That is the only way to demonstrate project impact

5. Recommendations on the way forward

In Lenche Dima, commendable work has been done in terms of enhancing the community's access to clean drinking water. Attention should be given to upgrading or maintaining the water pump, which is giving the community troubles due to its weak capacity. That, as the team understood during the field visit, represented one major felt need of the community.

Effective and efficient work has been done in terms of establishing physical water harvesting structures. The effort made in promoting the dome-shaped water structures is yielding encouraging results. Efforts should be further consolidated in the area of water harvesting, as water is one of the major determinants of livelihood systems in Lenche Dima watershed.

Joint planning review schedules (Research-Extension to be supported by AMAREW) have to be completed earlier than ARARI's annual review schedule. AMAREW should conduct its joint planning workshops by September-October beginning in 2006.

An aggressive technology popularization scheme should be designed and followed for those technologies that are rated appropriate and promising. For example, introduction of mango variety that reached fruit bearing stage in two years should be done aggressively to cover large areas.

The effort towards introducing new vegetable crops and assisting farmers to engage in on-farm seed production, for example North Showa, is one way to encourage the development of horticultural economies. A visionary intervention to link vegetable producers with the available

market has to be launched. Moreover, to encourage vegetable use at the farm level, home science training has to be organized for farmers.

Much has been done and achieved in terms of on-farm demonstration and validation of improved technologies. A concerted effort should be made to compile data and produce a popular publication in a way that allows technology scaling-up.

All (ARARI, BoARD, and AMAREW) should join their efforts towards convincing policy makers to support the linkage institutionalization efforts.

What has been achieved by the FREGs in terms of enhancing improved seed supply at the local level is encouraging. The FREGs should be organized to engage in scaling-up of technologies of proven performance and work in partnership with the PA administration and the Kebele Development Committees. They should operate as parts of the larger village system but not in isolation on their own.

Targeting farm HHs for improved technologies should be done in a way that ensures synergy in the farming system. Small-scale farmers manage multiple farm enterprises but not a single enterprise, due to this, fruit tree, small ruminant, crop, etc. technologies should be combined and given to single beneficiary HH to improve performance and encourage interrelations among farm system components.

The team has noted data collection and compilation of usable data to be the weakest links of the AMAREW Project field level implementers. The AMAREW staff has to shoulder the responsibility of developing data sheet that will be filled by the field level implementers as soon as possible. Field level implementers have to be serious in collecting and recording reliable data on all interventions.

It has been repeatedly noted that the woredas are underutilizing their AMAREW Project allocated budget. The WOARD and the woreda administration team have to take appropriate action without any further delay to improve the timely project budget utilization by closely following implementation of planned project activities.

Community empowerment has to be further strengthened to ensure sustainability of project achievements after project ends

AMAREW should focus on scaling-up of technologies with proven performance by concentrating only on few selected promising technologies.

Revisit the relevance of on-farm research projects underway, as some do not seem relevant in meeting farmers' needs. This is best achieved through promoting joint annual Research, Extension, and Farmer participation.

Review lessons learned on strengths and weaknesses of R-E linkage approaches promoted by AMAREW Project for scaling-up success.

Develop a workable system that ensures linkage between Research, Extension, and Farmers. Advise the DG of ARARI and the head of the regional BoARD to take the lead. Following the research-extension strategy of the region, an action document that specifies memberships, meeting dates, activity plan, budget, etc. should be developed. The AMAREW Project should play a leading role in developing the document

Future focus of the capacity building component of the Project should be on how to scale-up success areas and move forward.

AMAREW should work with its ANRS partners to delineate strategic elements that require STTA assignments to assist the regional development efforts.

Since all USAID funded projects have to comply with the M & E requirements of the donor, AMAREW has to sharpen its performance M & E plan. Because such a plan requires baseline data against which changes can be evaluated, AMAREW needs to assemble baseline data from relevant secondary sources or retrospective studies. For example, baseline data could be obtained from the regional BoARD survey of 56 woredas.

Although the project has accomplished much and is able to show to the internal evaluation team several good works in the field, many of them lack data to substantiate achievement. This should be considered a major gap and the project has to work hard to fill the gap in the remaining time of the project's life.

6. Overall Project Issues

The current development policy of Ethiopia takes the woreda as the centerpiece and unit of development. What the evaluation team has observed in some of the woredas visited did not show a condition that leads to the realization of the policy thrust. Some of the pilot woredas visited are experiencing leadership crisis and the development process faces serious challenges due to human factor. It is the understanding of the team that this may seriously impede the development endeavors from hitting their targets. It therefore suggested that policy level attention be given to rectify the situation.

Because the joint research-extension planning so far practiced did not encourage practical linkage to come by, in the remaining lifetime of the project the Project and its partners have to do their level best to promote timely joint Research-Extension-Farmer planning schedules. Beyond this, the regional government has to be advised to develop Research-Extension-Farmer linkage frameworks and modalities. The framework has to direct concerned development institutions such as the regional research institute and the regional agriculture and rural development bureau towards making linkages part of their value system. This in turn should lead towards institutionalization of R-E-F linkages.

Because all the WOARD at the project pilot woredas are characterized by underutilization of the budget allocated to them and this simply means loosing part of the budget to the donor, the team showed concern that serious thought be given to improving the budget utilization by the respective pilot woredas. Financial utilization reporting is the other drawback that characterizes almost all partners of the AMAREW Project, which needs significant improvement.

Because there are several research results be it from activities supported or not supported by the AMAREW Project that may bring economic benefits to the farming communities in the pilot project woredas in particular and the region at large, in the remaining project lifetime WOARDs and the respective research centers serving the respective AMAREW Project pilot woredas have to immediately engage in technology scaling-up and scaling-out endeavors rather than on merely development of more technologies.

In the interest of ensuring sustainability of project achievements in the pilot watersheds and extension sites, the AMAREW Project has to develop the project's phasing out strategy from its pilot sites. A document outlining the process to be followed to ensure sustainability of project

achievements has to be developed with full community participation and agreed upon by project stakeholders before the project phases out. This is particularly important to ensure the continuation of closed areas that are major components of the improved watershed management scheme.

7. Lessons Learned

In all woredas and research centers, important lessons have been learnt from the AMAREW Project including participatory planning exercises, working as a team for a common goal, enhanced accountability, search for relevant technologies regionally and nationally, participatory technology evaluation and validation, empowering communities for best results in watershed management, etc. Participating communities now feel capable enough to search, evaluate, and promote technologies appropriate to farmers' conditions.

Prior to the intervention of AMAREW, the two pilot watersheds (Yeku and Lenche Dima) were characterized severely degraded catchments. Soil erosion was a characteristic feature of the catchments. The Project rehabilitated the watersheds into model development sites and has been engaged in developing water retaining and harvesting physical structures such as hillside terraces, trenches, percolation pits and micro-basins. Water boreholes and storage structures were developed to assist community members to start vegetable and lowland fruit production. Due to enhanced recharging of water the water table in the watersheds, particularly Yeku, has been significantly raised. The lessons learnt from the watershed development has been extended to other pilot woredas and non-target sites of the project, such as the Milda watershed in Sekota, Achikan in East Belesa, and Gumet in Sekela.

The progress made through years from only rehabilitating smaller catchments to rehabilitating larger catchments by convincing communities is good practice which needs to be followed in future scaling-up efforts. Farmers believe in what they see and not much in what they hear. The fact that communities allocated larger parts of the mountains for enclosure is because of observing the benefits from earlier closed areas.

In terms of capacity building, the WOARD and ARARI centers have benefited from several knowledge and skill-upgrading trainings and long-term degree trainings.

1. Introduction

The Amhara Micro-enterprise development, Agricultural Research, Extension and Watershed management (AMAREW) Project is a USAID/Ethiopia Mission funded initiative established in July 2002 to provide technical assistance in integrated agricultural development in the Amhara National Regional State (ANRS). The Project works to strengthen agricultural research, extension, watershed management, capacity building, and micro-enterprise development in the ANRS by working with its ANRS partners in strategically selected three pilot watershed sites and eight pilot food-insecure Woredas (Table 1). The Project is being implemented by a Virginia Tech led Consortium (Virginia Tech, Cornell University, Virginia State University and ACDI/VOCA) in collaboration with its ANRS Primary Partners consisting of the Food Security Coordination and Disaster Prevention Office (FSPCDPO), Amhara Regional Agricultural Research Institute (ARARI), Bureau of Agriculture and Rural Development (BoARD), Environment Protection, Land Administration, and Utilization Authority (EPLAUA), Amhara Micro and Small Industries Development Bureau (AMSEIDB), and Amhara Credit and Saving Institution (ACSI). FSPCDPO has the overall role of coordinating Project activities; ARARI is responsible for the planning and implementation of research; BoARD plans and implements agricultural extension and watershed management activities in the pilot extension Woredas and watersheds; EPLAUA has the responsibility for guiding land use and certification in the pilot watersheds; AMSEIDB and ACSI shared responsibilities for micro-enterprise and micro-finance issues in the target areas of the project, until the beginning of 2005 when the Project was restructured. The technical advisors of AMAREW, one for each component mentioned above, work with and advise their respective line department experts in all stages of project activities.

The main project-wide problem since the beginning has been the continuing and extended uncertainty about the future and sustainability of the Project, which had impacted staff morale. This issue has been looming over the horizon since the beginning of the second year of the Project when the budget was drastically cut and subsequently the redesign issue surfaced. Both the Project management and the RIT interacted with the Mission intensively, and repeatedly, to find ways to stabilize the situation. Subsequent discussions between the RIT and USAID/Ethiopia did indeed stabilize the situation in that later in the year the focus was project restructuring in lieu of phase-out.

Since the beginning of 2004, the Mission has launched a new Integrated Strategic Plan (ISP), which has entailed the reassessment of its on-going projects to ensure that they fall in line with the new ISP. Consequently, the AMAREW Project has been targeted for restructuring following the elements of restructuring given both to the Contractor by the USAID Contracting Officer and to the Regional Implementation Team (RIT) by the Mission Director, hence the need for the restructuring.

1.1. Major Components of the Restructured AMAREW

1.1.1 Research: Supports applied food, agriculture, environment, and related natural resources management research at the regional level and below. The active participation of farmers and rural communities in identifying problems, demonstrating and evaluating alternative technologies, and on-farm trials as adaptive research approaches to test possible solutions is implemented to support and facilitate technology adoption.

1.1.2 Extension: The extension component responds to the needs and demands of the farmers in the project Woredas, with an emphasis on participatory

methodologies and active involvement of communities in the planning and implementation of development activities.

1.1.3 Watershed Management: The component facilitates the testing of the practical effectiveness and sustainability of a community based watershed management approach for environmental rehabilitation and ultimately attaining food security at watershed level.

1.1.4 Capacity Building: This component supports training, long and short-term, for ANRS personnel and farmers in essential disciplines related to adaptive agricultural research, extension, and natural resources management.

1.1.5 Micro-enterprise Development (MED) Component: The MED component has not been allocated earmarked funds during the Restructured AMAREW. However, as a part of the Project's work of the extension and watershed management components, MED related activities such as improved fuel efficient stoves, improved honey production and marketing, seed production of improved crop varieties, improved fish production and marketing, horticultural crops production and marketing, etc have been addressed. The Farmer-to-Farmer (FtF) program implemented in collaboration with Virginia State University has contributed significantly in this regard.

Table 1. Pilot target Woredas by zone and major activity components for the Restructured AMAREW Project are shown below:

Target Area	Research	Extension	Watershed	Safety Net Program
Wag Hamra Zone				
Sekota Woreda	X	X	X	X
North Wollo Zone				
Gubalafto Woreda	X	X	X	X
South Wollo Zone				
Tehuledere Woreda	X	X	X	
South Gonder Zone				
Lay Gaynt Woreda	X	X	X	
North Gonder Zone				
East Belessa Woreda	X	X	X	
North Showa Zone				
Ankober	X	X		
Ensarona Wayu	X	X		
West Gojam Zone				
Sekela	X	X	X	

2. Election of Chairman and Secretary

The members of the evaluation team were:

1. Ato Amlaku Asres ……. Head, FSPCDPO, Chairman
2. Dr. Enyew Adgo ……..... NRM Research Director, ARARI
3. Ato Alemnew Alelign ……. BoARD
4. Ato Getahun Alemneh ……..……... EPLAUA, Land Admin. Expert
5. Dr. Belay Demissie ……..……..…. CTO, AMAREW, USAID/Ethiopia
6. W/ro Metselal Abraha ……. USAID
7. Dr. Brhane Gebrekidan …… CoP, AMAREW Project

AMAREW Project Staff::

1. Dr. Eshetu Mulatu ……. AMAREW, Training Advisor/FtF Coordinator
2. Ato Yacob Ashine …….. AMAREW, Extension Advisor
3. Ato Getachew Bayafers …… AMAREW. Watershed Management Advisor

The team elected Mr. Amlaku Asres, Head FSPCDPO and RIT Chairman, to chair the evaluation team. It also assigned Dr. Eshetu Mulatu, AMAREW Project training advisor, to serve as the team's secretary.

3. Understanding the SoW

Discussion on the evaluation Scope of Work (SoW) (Annex 1) was then held for better understanding of all team members prior to the team's engagement on the evaluation exercise. The team reached a consensus to conduct the evaluation in a way that enables capturing success stories, limitations, and strengths of the different project components and suggest on perspectives on the way forward. Amongst others, the team focused on the following:

- To follow the leading and probing questions given in the SoW to generate information and field level data,
- To assign individuals or accept team members who volunteered to frame and pose questions to community members, private farmers, Woreda Office of Agriculture and Rural Development (WOARD) staff or any other body that in one way or another has relations with the project. The interview schedule followed a semi-structured interview guideline,
- To focus during its field enquiries on project implementers and targeted beneficiaries (communities and individuals) to get complete picture on their degree of participation in the project. Beneficiary communities, private farmers and grassroots-level development agents were interviewed at sites of performance, whereas WOARD and Woreda Administration staff-related inquiries were posed at the round-table discussion held later in the day. The round-table discussion forum was also used to reflect back on the drawbacks noted in their Woredas during the course of project implementation,
- To delineate problems encountered in the course of project implementation,
- To assess whether problems that affected project implementation and discussed during the 2005 workshop held at Woldiya was addressed or not? If addressed to note the improvements attained thereafter and if not addressed to note why?
- To note project achievements, changes made from preproject period and frame up those that are worth scaling-up,
- To specifically note elements of the project that should be improved in the subsequent project period, and
- To consider and bring into light, among others, the issues of land certification in both Yeku and Lenche Dima pilot watershed sites.

4. Day 1: Sekela Woreda
(August 4, 2006)

4.1 Field visit at Gumet Integrated Watershed Development Site

The evaluation team first visited the on-farm potato seed production and marketing scheme initiative at Sawsa Gind Atemem village. WOARD and AMAREW Project Staff gave explanation on the initiative.

The seed production scheme was initiated upon the request of the community and the WOARD in view of the importance of the potato crop in farmers' livelihoods. The plan to establish a 100,000 t annual capacity potato dehydration plant at Injibara by Rotary International within the coming two years also motivated the initiative. In the absence of an organized seed production and supply scheme that makes available potato crop of known origin and end uses, it would be difficult for the envisaged plant to become operational.

Seven improved cultivars sourced from research centers at regional and national level were planted on 6 farmers' fields for basic seed production together with the only available local variety (Table 1) in collaboration with the Adet RC.

Table 2. Improved potato cultivars under evaluation at Gumet watershed for on-farm seed production and supply scheme establishment

No.	Variety	Releasing Research Center	Flower color	Yield (t ha^{-1})		Quantity planted (kg)	Area planted (m^2)	Farmer's name
				On-station	On-farm			
1	Zengena	Adet	Purple	35	25	100	450	Wubet Konne
2	Guassa	Adet	White	33	25	100	450	Nebiyou Ayalew
3	Wochecha	Holetta	White	27	17	100	450	Nebiyou Tibebu
4	Jalenie	Holetta	White	40	29	100	450	Nebiyou Ayalew
5	Marachare	Debub	White	24	16	100	450	Biruh Kassa
7	Gorebela	Debre Berhan	White	40	30	100	500	Fekadu Mulu
8	Gera	Debre Berhan	White	35	25	200	1000	Kokeb Biruh & Mezgebu Mihret
9	Ater Abeba*	Local	Purple	-	6	100	450	Nebiyou Ayalew

*Local variety

Following the field visit and detailed discussion over the idea, the farmers requested the evaluation team to test the varieties for culinary and taste quality rating from the consumers side. The evaluation team did accordingly and rated the varieties.

Following the potato field visit, the WOARD team gave explanation on the effort being made to introduce highland fruit trees. Accordingly 1000 seedlings of apples, plum and pear were distributed to farmers to plant and manage on their private holdings. The team visited already established seedlings in one farmer's plot (Fig. 2 and 3).

Fig. 1. Farmer Fekadu Mulu of Gumet Watershed, Sekela Woreda, standing in his potato seed production plot of variety Gorebela

Fig. 2. The evaluation team members taking notes of explanation given by the Sekela WOARD Staff

Fig. 3. Gumet Watershed farmers explaining to the evaluation team the Project activities which they are accomplishing

4.2 Highlighted Capacity Building Interventions

Farmers Research Extension Group (FREG) training has been offered to seven WOARD staff. Six seed producer collective action group members and one DA have received hands-on training on-potato seed tuber production and management. Agroforestry (integration of highland fruit trees) training was given for three days for 31 community members including WOARD experts. Moreover, 13 community members and WOARD staff have made an experience sharing tour to Lenche Dima and Yeku integrated watershed development sites. A potato field day in which 60 farmers and other professional and Woreda administration and WOARD staff participated was observed.

4.3 Highlighted Extension Component Interventions

For the 2006 crop season extension activities, 45.5 qt of triticale (Var. Minet), 7 qt of potato, 36 kg of vegetable seeds and 4750 sweet potato cuttings were supplied to selected farmers for planting.

4.4 Highlighted Watershed Component Interventions

In Gumet watershed one nursery was established, 12 ha were closed, and 56 gabion check dams were constructed. Moreover, bund maintenance work was done on 220 ha.

4.5 Day's Evaluation Wrap up Meeting at Gishe Abay WOARD Office, August 4, 2006

After briefings by the RIT team representative on the interest of the evaluation team, short discussion was made on major issues of concern. Answers for questions raised by the evaluation team were given by the Woreda representatives (WOARD and Administration).

Question: Where are you now in terms of budget use compared to 2005?
Answer: Of the 2006 first quarter 40% allocated budget we have so far utilized 60%. Although we are still far behind, our budget use has much improved over the past year.
Question: Did sense of project ownership develop among the Woreda staff (WOARD, Administration, and others)?
Answer: Our understanding of the project is still limited. So far it is only the WOARD that follows the project. As WOARD is suffering from frequent staff turnover (Woreda heads, project focal persons) sense of ownership as such has not developed.
Question: What problems impede realization of planned project activities?
Answer: The WOARD as well as other sector offices suffer from understaffing. WOARD operates with about 56% work force as out of 81 positions only 46 are filled. The other problem is that sector offices don't come together to join efforts and discuss over issues. For example, the Woreda administration team has never taken initiatives to inquire about the Project. What we know is just a here say but no more. Take also note that some of the sector offices function without bureau heads; case in point is the WOARD whose head is currently under detention.
Question: How is the collaboration among different sector offices in supporting day-to-day implementation of project activities?
Answer: As no proper leadership was given from the administration team to take care of such issues, collaborations among sector offices have not as such developed.

4.6. Recommendations on the way forward

General recommendations were given to improve budget use, to give proper leadership towards the project, to strengthen collaboration among sector offices and to closely monitor project implementation.

5. Day 2: Lay Gayint Woreda
(August 5, 2006)

5.1 Field Visit

5.1.1 The Research and Extension Components

FREG was established with a total of 25 (21 male and 4 female) farmer members since 2003 in one of the Project's extension sites. The FREG was established by the Adet Research Center (ARC) to facilitate evaluation, adoption, and diffusion of improved crop technologies, mainly improved crop cultivars. The FREG accesses source-seed of improved crop cultivars through the ARC, evaluates and promotes best performing ones for further diffusion into the village farming system. The FREG has so far evaluated the performance and accepted for diffusion several improved cultivars of various crops (Table 3).

Table 3. Improved crop cultivars evaluated since 2003 by the FREGs in Gobgob and Yedoro extension sites in Lay Gayint Woreda

Year	Crop	No. of FREG members to plant evaluation plots*	No. of varieties evaluated	Name of varieties evaluated	Varieties approved due to good performance	No. of 2nd level beneficiary farmers
2006	Potato	2			Not yet	Not yet
	Linseed	2			Not yet	Not yet
	Barley	6			Not yet	Not yet
	Faba bean	10			Not yet	Not yet
	Wheat	15			Not yet	Not yet
2005	Lentils					Unknown
	Wheat	25	6	HAR-1868, HAR-604, HAR-1685, HAR-1775, HAR-2029, HAR-2536	Not due to rust	Unknown
	Barley (food)	11	3	Shedeho, Mulu, Setegne	Shedeho	
	Linseed	3	3	Gereger, CI-1522, Berene	Geregera	
	Potato	2	4	Tolcha, Jaleni, Zengena, Wochecha	Zengena / Wochecha	
	Faba bean	15	3	CS-20-DK, Degaga, Messay	CS-20-DK, Degaga	Unknown

*Some FREG members work on two crops in a season

The seeds of improved cultivars for further diffusion are multiplied on plots owned by FREG members and supplied to other farmers under a revolving seed scheme. Seed exchange has however remained closed to FREG members' circle and, hence, has not been done to a level that brings meaningful impact. The FREG organizes farmers' day to help non-FREG farmers observe the performance of the improved crop technologies and make their own decisions on whether or not to adopt the new technologies. No further popularization work has, however, been done by the FREG.

5.1.2 Capacity Building

The FREG members received four trainings in different years since they were organized into FREG including a 5-day training in 2005.

5.1.3 FREG Members' Assessment of the Technologies Introduced and the Approach to Work

According to FREG members assessments, the newly introduced improved crop cultivars are early maturing, whereas the ones in their stock are late maturing. For example, the local potato cultivars should be planted in March and harvested in October, whereas the improved varieties are planted in May or even planting could be extended up to June for some of the new cultivars for September harvesting. The improved cultivars hence better fit their growing condition, which is mainly defined by the rainfall distribution. The skin quality, taste and yield of the improved varieties are better compared to the varieties in their stock. In terms of disease resistance, particularly late blight, the improved cultivars show better resistance compared to the local cultivars.

The FREG operates according to a preset work plan, which includes implementing regular meetings and field visit schedules. They had their last meeting in June 2006 during planting and are planning to conduct soon field evaluation of the cultivars planted. For example, plots have been selected for cultivars evaluation of different crops based on FREG members and WOARD staff joint decisions. Fig. 4 and 5 depict the field level meeting between FREG members, WOARD staff and the RIT evaluation team.

Fig. 4. Yedoro Village FREG members in Lay Gayint woreda explaining to the RIT evaluation team about their activities

Fig. 5. The RIT evaluation team taking notes on field activities in Lay Gayint Woreda

5.1.4 Problems Identified by the FREG members and the Evaluation Team

- The Woreda administration is neither motivated to closely follow nor aware of what the FREG is all about. Discussion should hence be initiated with the WOARD to understand why they are not closely following the operation of the FREG and discuss expected roles of WOARD and agree on mechanisms that improve their participation in FREG activities.
- The Adet research center, the initiator of the FREGs is almost operating alone and needs strong teaming with the WOARD and get support from the same.
- Neither the Chairman of the PA, nor the Kebele Development Committee is informed about nor does know the plans and activities of the FREG. Failure to inform and involve the PA leaders and the development committee in the FREG activities is a drawback from the DA side and has to be rectified for the future.
- FREG members do not know the total crop area covered by improved varieties under their seasonal operation. They together with the DA and WOARD staff should have data on total area under their operation. This is necessary to note if there is an increase in area of improved crop varieties due to FREG's influence.
- FREG members do not have readily available records on yield of improved varieties tested by them, as compared to yield from local varieties. This is necessary to note changes brought due to activities of FREG.
- Although the FREG members demonstrated good knowledge on improved crop management practices, untimely input delivery (fertilizers, protection chemicals), was recognized as a drawback that impeded the materialization of their knowledge and skill.

5.1.5 Recommendations on Improving FREG Organization and furthering the Improved Varieties

The organization of the FREG has to be changed from a permanent membership to the one which is time-bound and generates followers within a specified time period. For example, first level beneficiaries from FREG operation may stay for two years and then should organize second level beneficiaries who will operate for the same time and then organize other. This is one mechanism to disseminate new technologies introduced through FREGs and share benefits from new technologies equitably among community members. It is also a way of scaling-up the technologies to bring a meaningful impact.

5.2 Highlighted Capacity Building Interventions

Long-term degree (3 BS) and several short-term in-service trainings have been offered to WOARD staff and selected farmers and community leaders. FREG members have received training at different times related to quality seed production (mainly potatoes), the relevance of sprouting potato seed tubers in a Diffused Light Store (DLS), methods and materials required to construct privately owned DLS. They have also received motivational training to recruit followers though, due to less attention given, they didn't work in that line.

5.3 Highlighted Extension Component Interventions

- Extension interventions in Lay Gayint model sites include distribution of improved seed in a revolving seed scheme, improving small ruminant production and on-farm multiplication of selected improved varieties for further diffusion into the farming system. Since the start of the AMAREW project several farmers received improved seeds of different crop cultivars and the FREG was also engaged in seed multiplication of improved crop cultivars selected by farmers (data required from extension).
- In view of improving the size of the Farta type sheep, AMAREW has distributed to selected house holds (HHs) 48 Washera (Dangla) type rams. Thirty beneficiary farmers from Yedoro Kebele received three ewes and one ram per HH.
- According to the current intervention arrangement a farm HH may benefit either from one or a combination of technologies. The latter is opted to improve synergy of the farm system, as small-scale farmers seldom manage one single enterprise but multiple enterprises at a given time and space.

5.4 Highlighted Watershed Component Interventions

- To rehabilitate degraded land and enhance farm income through high value crop introductions, 30 farm HHs in Gob Gob Kebele have received 400 apple seedlings, whereas 30 farm HHs in Yedoro Kebele have been supplied with 425 fruit tree seedlings. All farmers have planted the seedlings on their private holdings.
- Technical advises on management aspects have been given. The farmers in each Kebele are organized into three FREGs for easy monitoring of the intervention and easy channeling of further technologies. It is also sought to organize the starter fruit producers into collective action groups for better opportunities to access inputs and markets.

5.5 Highlights on land administration issues

Farmers and WOARD staff indicated that they are in the process of finalizing land certificate issuance.

5.6 Benefits to farm HHs due to the interventions

- The Washera sheep distribution effort is just yielding as most of the ewes have either conceived or have already lambed. Kids from the program have not yet reached a marketable age.
- Since the fruit tree seedlings were just distributed in mid-2006, the benefits are not yet evident.
- Although farm HHs may have benefited much from the improved seed distribution scheme, data that show achievements were not made available. Wheat, although was one of the highly targeted crops for improved seed distribution, damages due to rust diseases have obscured benefits.

5.7 Highlights on Relations of AMAREW Interventions with Safety Net Programs

Out of the 30 farm HHs who were targeted for the fruit tree seedling technology in Yedoro Kebele, 10 are farm HHs who are under a Safety Net Program. In the same say, out of each 10 farm HHs targeted for the Washera sheep technology in Yedoro Kebele, 8 are farmers under the Safety Net Program. Although the Woreda did not very well integrate AMAREW's interventions with its Safety Net efforts, it claimed that more of the beneficiaries targeted for AMAREW Project are disadvantaged HHs.

5.8 Farmers and WOARD assessment of the AMAREW project

- The AMAREW Project introduced several useful technologies for farmers' use. Mention could be made of the Washera type sheep with demonstrated fast growth compared to the slow growing small size locally known Farta type sheep. The different improved crop varieties introduced based on farmers' assessments have all shown fast growth, good response to overall crop management and better yield. A newly introduced Tef variety has, for example, yielded 2 t ha^{-1}, whereas the local varieties are not yielding more than 0.8 t ha^{-1}.

- Important lessons have been learnt from the AMAREW Project including participatory planning exercises, working as a team for a common goal, enhanced accountability, search for relevant technologies regionally and nationally, participatory technology evaluation and validation, empowering communities for best results in watershed management, etc. We now feel capable enough to search, evaluate and promote technologies appropriate to farmers' conditions.

5.9 Recommendation

5.9.1 Recommendations on beneficiary selection and each component's intervention

- AMAREW, being a food security project, should target primarily disadvantaged members of a community that are eligible for a Safety Net Program, according to the Head of the FSPCDPO. For example, while there are 700 farm HHs in Yedoro Kebele under a Safety Net

Program, the WOARD should have not targeted the 2 non Safety Net farmers for each 10 HH targeted.

- All the highlights given on each component are data-deficient. WOARD and the Project should compile data on component and technology basis. Yield data have, for example, to be given for each crop variety. Total technology users have also to be known under the different components and it should be possible to track the changes brought about by each intervention.

5.9.2 Comments on monitoring & evaluation (M&E) of project activities

FREG members participated in the discussion, which revealed that M&E is the weakest link. Participants felt that this is taken to be the responsibility of the WOARD staff but not that of theirs. WOARD also explained that no planned M & E of Project interventions has been done so far.

5.9.3 Recommendations on improving FREG's Performance

FREG Members	WOARD / DAs	Woreda Administration Team
Improve the organization of the FREG to include all stakeholders (PA leaders, DAs, Development Committee members) and for technologies to cascade to none FREG members	As much as possible link AMAREW's interventions with the Safety Net Program in your Woreda, since AMAREW is a food security project	Should know each and every project running in the Woreda
Promote validated technologies for other farm HHs use. FREG makes sense only when technologies are further disseminated to reach other farmers	Generate and hold quantitative data for all the interventions. That is the only way to demonstrate project impact	Should be able to periodically evaluate the performance of each project carried out in the Woreda. Should be well informed and up to date of all projects

5.10 Day's Evaluation Wrap up Meeting at Nefas Mewcha Woreda Administration Office, August 5, 2006

The Evaluation Team Chairman gave an explanation on the team's mandate and interest. In the interest of understanding the level of linkage between different projects working towards common goal and knowing the level of follow up by the Woreda Administration team, the Chairman inquired whether the World Bank Food Security Project, the Federal Government Safety Net Program, and the AMAREW Project as a food security project are linked and whether the Administration team is following on that.

5.10.1 Response from the Acting Administrator

Lay Gayint Woreda is divided into 7 sub-Woredas. There is a team led by the administrator that overseas all administration and development efforts run in the Woreda. The team has a scheduled monthly meeting to discuss issues related to different sectors like education, health, agriculture, etc. During its scheduled meetings the team evaluates plans versus implementation of projects under the different sectors. I may not say this is being done properly in recent times due to one major drawback that we are experiencing in Lay Gayint Woreda, which is weakness of the administration system. The Woreda operates under conditions where there is neither assigned administrator nor deputy administrator for long time. The office was run by Officers-in-Charge at

different times. Moreover, note that of the total 13 administration team members 6 or about 46% are attending summer classes. These situations have negatively impacted our performance and all development activities including that of ensuring linkages between different projects.

Several projects are operating in the Woreda including that of ORDA, AMAREW, GTZ, etc. Due to this there is an NGO discussion (advisory) forum. The AMAREW Project is, however, not represented in that forum and its performance has never been evaluated. As AMAREW is led by mix of professionals (research, extension) neither the WOARD head nor the administration are involved in its leadership.

5.10.2 Response from the WOARD representative

The WOARD is also experiencing the same serious problem as noted by the acting administrator. The bureau head is incarcerated and DAs do not follow orders. Most of the DAs are currently not in their duty station; they are rather in Nefas Mewcha town. Moreover 20 DAs from Tache Gayint and 6-8 from Lay Gayint are currently attending summer classes at different universities. Even with such big numbers at school, we have sufficient workers to take care of all our planned work. The problem is, under conditions where there is no bureau head, nobody is ready to take work related orders. We know the cause of the incarceration, and could have been good witnesses, but because we know deep into the cases, the Region and the Zone are not ready to talk to us and clear the matter. There is a WOARD meeting scheduled for August 7, 2006, I am ready to raise the issue for discussion, but I don't think that helps much.

5.11 Recommendations on the way forward

- In the absence of an administrator or his deputy we can realize how it could be difficult to operate normally and respond optimally to development issues. The Woreda has to work hard to get an administrator and a deputy assigned. That is only then that you may be able to take care of technical issues requiring your attention like proper follow up of projects.
- In the past no effort was made to monitor linkages between projects. Hereafter, the Woreda administration team has to make sure that development projects operating in the Woreda are linked to the Safety Net program. This could be done in a way that the administration team considers to be appropriate to enhance project performance.
- The FREGs we noted in Lay Gayint have organizational deficiencies. They are not time-bound and nor are they formed in a way that may consider new membership through time. They were made to serve the original members for the last 4 years. You should hence form the FREGs as time-bound entities that continuously consider new membership. Only such organizational set-up will help empower more farmers in research-extension skills.
- What has been achieved by the FREG in terms of enhancing improved seed supply at the local level is encouraging. Due to organizational problems, the FREG did not perform to the expected level. The improved varieties of proven performance did not, for example reach farmers that are not FREG members. The FREGs should be organized to engage in scaling-up of technologies of proven performance. The FREGs should also work in partnership with the PA administration and the Kebele Development Committees. They should operate as parts of the larger village system but not in vacuum on their own as they are doing it now.
- Targeting farm HHs for improved technologies should be done in a way that ensures synergy in the farm system. Small-scale farmers manage multiple farm enterprises but not a single enterprise, due to this, fruit tree, small ruminant, crop, etc. technologies should be combined and given to single beneficiary HH to improve performance and encourage interrelations among farm system components.

- We have noted data collection and compilation of usable data to be the weakest links of the AMAREW Project field level implementers. The AMAREW staff has to shoulder the responsibility of developing data sheet that will be filled by the field level implementers as soon as possible. Field level implementers have to be serious in collecting and recording reliable data on all interventions. If we don't do this then there is no way to track changes brought about by the Project.
- We have noted that there was no effort to periodically evaluate the performance of the AMAREW Project. Reasons that go beyond the control of the project and the implementers might have contributed to this, like for example the serious drawbacks mentioned about the administrative failures. Monitoring and evaluation is the only tool that we have to note if projects are operating as required and if they are moving towards achieving their goal. Because it is a no choice case, the condition has to be rectified without any further delay.
- Mention made of the failure of many farmers to repay credit is a signal that worries us all very much. Failure of farmers to repay credit may entail revoking the Safety Net programs from the Woreda. The Woreda has, therefore, to consider this case seriously and work towards improving credit repayment rates.
- It has been repeatedly noted that the Woreda is underutilizing its AMAREW Project budget. It is also understandable that farmers want to enhance their living standard by accessing workable improved technologies and working hard. We should be able to reconcile this paradox. The problem is from the side of the development worker and those leading the Woreda. The Woreda administration team has to take appropriate action without any further delay to improve the budget use by closely following implementation of different projects. Take this as an agenda and discuss over it in the forthcoming meeting of the administration team.

6. Day 3: Sekota Woreda
(August 6, 2006)

6.1 Field Visit Yeku Integrated Pilot Watershed Management Site

6.1.1 Explanation by the WOARD team

"Prior to the intervention the Yeku watershed encompassed a 580 ha of water-short and severely degraded catchments. Soil erosion was a characteristic feature of the catchments. We first demarcated the watershed to be rehabilitated then we engaged in developing water retaining and harvesting physical structures such as hillside terrace, trench, percolation pits and micro-basins. We then engaged in developing water boreholes to assist community members to start vegetable and lowland fruit production. Due to enhanced recharging we are now at a stage where the water table can be reached at 10 m depth. In the borehole development effort the AMAREW Project provided farmers with cement for lining boreholes and building retention walls. Community members contribute labor and all other locally available materials. Due to the suitability of Yeku for apiculture we largely promoted improved apiary technologies. We have now scaled-up lessons learnt from the watershed development effort to the Milda watershed which covers 200 ha catchments. In terms of capacity building the WOARD has benefited from several knowledge and skill-upgrading trainings and long-term degree trainings. We were given by the Project one pick-up truck which facilitated not only our effort towards the Project activities but also our regular extension endeavor" The watershed has now completely changed (Fig. 6).

Fig. 6. RIT evaluation members impressed by achievements at Yeku integrated watershed development site

Following the explanation, the evaluation team made an extensive visit of the watershed and noted the different water harvesting structures constructed down-hill from the mountain tops. It also noted the replanting efforts and collected information on the composition of the tree species planted. In the mean time, a lot of discussions were held in the form of questions posed at different stops by the evaluating team while the WOARD team made responses. An account of the issues of the discussions is given hereunder:

Question: Why are you not able to treat the entire watershed after four years of intervention?

Answer: We did not yet cover the entire watershed despite four years of effort (2003-2006) due to farmers' resistance in the first two years. Conditions dramatically changed in the 3rd and 4th year of intervention due to community understanding of the benefits of watershed development. As of the 3rd year communities willingly allocated large tracts of catchments for enclosure until labor became a limiting factor to cover more areas.

Question: Yeku is identified as an integrated watershed management site, to what extent are then activities in the watershed integrated?

Answer: In terms of integration, we work with crops, Abergele goats, apiculture, water point development for irrigation, community and livestock use in addition to the major effort towards developing the watershed.

Question: Which appropriate technologies have you obtained from the research center near by?

Answer: The research center, in addition to leading participatory on-farm varietal selection of some crops, is researching to identify appropriate feed species, gulley treatment methods and applicable drip irrigation methods.

Question: What are your plans to integrate dryland fruit culture into the watershed development effort?

Answer: We are introducing adaptable fruit crops of economic importance in four villages within the watershed together with water harvesting structures. For two reasons we didn't plan to plant fruit trees in the closed communal land: (1) difficulty to obtain sufficient seedlings for catchments planting, and (2) problem of water in the dry season. As the soil is sandy, one should follow and provide on-the-spot irrigation in the dry season, but this is not feasible on communally owned catchments. When in the future the rehabilitated land is distributed to private individual farmers, fruit tree plantings could be one option.

Question: Has the WOARD any plans to scale-up lessons from Yeku into other degraded watersheds?

Answer: We have already scaled-up achievements from Yeku into the Milda watershed and results are promising there as well.

Question: What is the relevance of introducing invasive tree species such as *Acacia saligna* while you operate in a site where there are a number of indigenous acacia species emerging due to natural regeneration?

Answer: We are introducing non-indigenous tree species such as the *Acacia saligna* to meet the multiple objectives of the planting program such as forage production, fire wood and timber production, etc. *A. saligna* was selected due to its fast growth and earlier canopy coverage compared to the indigenous Acacia trees.

Question: Have you generated quantitative data on survival rate of the tree species that you planted in the watershed through the years? Is the natural regeneration counted? Is there any baseline data against which one may compare pre-and-post watershed management results?

Answer: No work has been done to document survival rate of the seedlings that were planted. The Project office may have collected baseline data at the start of the Project. In that case it is not yet late to study the regeneration ecology due to the soil seed-bank.

Question: How long could water found at a 10 m depth last in the harsh dry season? Do you really believe that the physical structures already constructed downhill are sufficient enough to retain the amount of run-off from up-hill?

Answer: There is a plan to construct 2 m deep infiltration pits all along the watershed to enhance the soil-water recharging capacity. S-S check dams are more appropriate in Yeku due to poor structure of the soil. In 2005 the water lasted up to April.

6.2 Meeting with community members

Upon completion of the field visit, the evaluation team met with community members to understand their perception on the Project (fig. 7 and 8). The representatives of the community briefed the evaluation team about the contribution of the Project towards improving their livelihood systems.

6.2.1 Highlighted Capacity Building Component Interventions

Long term (5 BS) and several short-term training have been offered to empower WOARD staff and community members. These include goat husbandry, energy saving stove production (for women), etc.

6.2.2 Highlighted Extension Component Interventions

- The project has done restocking of goats at individual HH level under a revolving goat provision scheme (fig. 9). That has increased the goat population in the four villages of the catchments. In the four villages of the catchments there are 355 HHs, which were originally planned to benefit from the restocking scheme. In 2003 out of a total of 18 HHs who were given goats as first-level beneficiaries, 10 of them passed the first-born kids to 10 second-level beneficiary HHs. In 2004 all the 44 beneficiary HHs from the restocking program passed first born kids onto the same number of 2nd level beneficiaries. The intervention was also gender-focused as for example 12 women headed HHs received six goats each as first level beneficiaries.
- Apiculture development is another area from which the community benefited much. This was also done in a revolving scheme.
- The Project led small micro-enterprise development efforts. For example, 10 women were organized and trained to engage in energy-saving stove production and marketing. So far each of them has got a benefit of Birr 300.

6.2.3 Farmers and WOARD assessment of the AMAREW project

- Major contribution of the Project is the rehabilitated watershed that you have just visited. That is a timeless contribution as it determines future community wellbeing.
- Due to the interventions of the AMAREW Project, livelihoods of community members in the four villages are improving. Improvement is recorded particularly in livestock holdings (goat, apiary).
- Project has also improved communities' access to clean potable water and water for the livestock (fig. 10).

Fig. 7. RIT evaluation team members discussing under shed with Yeku watershed community members

Fig. 8. The RIT evaluation team chairman discussing with a farmer at Yeku on project endeavors and achievements

Fig. 9. One of the focus areas of the AMAREW Project extension activities in Yeku watershed is goat restocking

Fig. 10. A drinking water point developed by the AMAREW Project in collaboration with WOARD and community members at Yeku watershed in Sekota Woreda

6.2.4 Relations of the watershed committee with the Kebele administration

A 32 members watershed committee has been organized in the four villages found in the Yeku watershed. Whenever this committee needs the support of the Kebele administration it suffices to summon the latter to get its assistance.

6.2.5 Issue of concern raised by community members

Earlier, the intervention with modern beehives and goat restocking was done under a revolving scheme whereby first level beneficiaries pass the technologies to second level beneficiaries in kind. It was an approach that pleased all community members. In 2006, WOARD introduced a different approach for both technologies, which is a credit scheme payable in cash with interest. Community members are reluctant to sign for credits payable in cash due to the large interest they have to pay. That is not a solution to bring us out of poverty. The earlier approach should be reinstated for enhanced access of community members to the above technologies. The community has plans to specialize into goat and honey production and marketing associations in the future. Moreover, the community has plans to establish community-managed seed banks for enhanced coping ability and increased resilience.

6.3 Day's Evaluation Wrap up Meeting at Sekota Zone Administration Office, August 6, 2006

The Evaluation Team Chairman gave an explanation on the team's mandate and interest. The Chairman highlighted that based on the output of the field visit the discussion may focus on what has so far been done in the pilot watershed and in the three extension project intervention sites including lessons learnt and any scaling-up efforts of technologies of proven performance, level of linkages between the agricultural research and extension systems at the Woreda level, the changes brought about due to the AMAREW Project, level of integration of the AMAREW project with other projects operating in the Woreda but working towards the same goal as AMAREW, level of follow up of the AMAREW Project by the Woreda Administration team, etc.

6.3.1 Response from Sekota ARC manager

The Sekota ARC is operating in the three Project extension sites, Tsemera, Mahebere Genet and Hamusit. Our interventions include the following:

- ***Livestock development:*** We are working on improving production and management of the Abergele goats and introduction of modern apiculture. The center has just completed research on goat milk enhancement husbandry techniques and that will be presented in the completed research forum of ARARI to be held in Bahir Dar in the near future. The center has also bought Barka goats and distributed to beneficiary farmers in Abergele Woreda. Barka goats have high milk potential (up to 2 l day^{-1} $goat^{-1}$) and by interbreeding of the two types the center is trying to improve the milking potential of Abergele goats. Though this is being done out of AMAREW's extension sites, the improved crosses will reach farmers in AMAREW's extension sites through future scaling-up efforts.
- ***Natural resource development:*** We focus on introduction of technologies with proven potentials to rehabilitate degraded farmlands.
- ***Crop development:*** We implement several on-farm technology testing and validation experiments in the areas of agronomy, crop protection, and soil and water conservation.
- **Socioeconomic research efforts**: The AMAREW Project that enabled evaluation of several technologies has supported different on-farm research undertakings. For example, agronomic and economic evaluation of Triticale and tef improved cultivars have been done in Yeku

watershed and Hamusit extension sites. Cultivars of proven performance have already been promoted to the dissemination stage.

- Related to issues of scaling-out there are attempts to work with sorghum and wheat varieties of proven performance. In this regard there is an AMAREW initiative to organize and work with FREGs. About seven researchers and five WOARD staff have received training on FREG and they will in turn train WOARD and other research staff. We then will organize FREGs in AMAREW's watershed and extension intervention sites not only for technology evaluation and validation exercise but also to handle matters of scaling-up.
- There is a widespread understanding that Research-Extension (R-E) linkages are useful to better respond to small-scale farmers' needs. But due to commitment and follow up failures from all side, strong R-E linkage has not occurred. AMAREW has organized and facilitated workshops (planning and implementation) and has developed Memorandum of Understanding (MoU), which was signed between WOARD and the research center. We shall show commitment and move beyond signing MoU if we want to get the linkage machine moving.
- We always encounter budget release delays and that also needs improvement for us to come out of the vicious circle of low burn rate. For example, in 2005/06 our burn rate of the capital budget was 94% whereas that of the AMAREW Project was only 78%. Nothing but delay in budget release contributed to such low burn rates of the annual Project budget.
- AMAREW's on-farm research R-E joint planning schedule has always mismatched with ARARI's review schedule. Our plan is to review at the center level in November and at the Region level in January of the respective years, whereas AMAREW's planning and implementation workshop is called in March of every year. This scheduling mismatch creates implementation problems. As a short-term option, in 2006 the research center has taken its own initiative to work on experiments to be financed by AMAREW earlier than the planning schedule. But this is not a long-term strategic choice and AMAREW has to bring forward its planning schedule to accommodate that of the research and extension planning schedules.

6.3.2 Response from Sekota WOARD head

In the three AMAREW extension intervention PAs (Tsemera, Mahebere Genet and Hamusit) and Yeku pilot watershed site, WOARD is engaged in various technology promotion efforts:

Crop development: Promoting improved seed of on-farm experiment validated improved crop cultivars including their management for better output,

Small ruminant development: Restocking of sheep and goats to disadvantaged HHs in a revolving small ruminant provision program,
Livestock feed development: Backyard and plot border feed development activities to improve feeding of small as well as large ruminants,

Watershed development: Activities of watershed development with physical and biological structures largely done at Yeku site.

Related to R-E linkage, he mentioned of the 2006 joint on-farm planning and implementation workshops held at different times at Kobo. He also referred to the signed MoU between the research center and the WOARD to facilitate linkages. Moreover, he highlighted the importance of the FREG training that both the research and WOARD staff received in Kobo in 2006. That, he emphasized, was a strong move towards strengthening R-E linkages.

6.3.3 Following the explanations the evaluation team raised the following questions:

- The project is in its 4th year, why was the mismatch between the review schedule of the research, extension and AMAREW left unquestioned for such a long time?
- What is the level of understanding and control of the Woreda administration over the AMAREW Project? How far does the administration understand the efforts of AMAREW in the Woreda? Had the administration ever considered relevant and included in its annual report what is being done and achieved due to the AMAREW Project? How do you value AMAREW's approach of engaging the WOARD and the Sekota ARC to fully assume responsibility of implementing the research and development interventions supported by the Project?
- The evaluation team has observed inappropriate tree species selection for the Yeku watershed rehabilitation. This shows that either there is no input from the research or if any, it is minimal. How are the R-E linked in the area of natural resource rehabilitation?
- You reported timing mismatch between the research and extension review schedules at the Woreda level. Does that mean there is no Research Extension Liaison Committee (RELC) at Woreda level? Is the research not developing proposals based on feedback from extension? Are you still following the conventional way of developing research proposals that reflect the interest of the researcher? Do you observe farmers' days as a means of evaluating technologies?
- Have you ever assessed if there are any relevant technologies in the other AMAREW pilot Woredas that may be scaled-out to Sekota Woreda?
- AMAREW being a food security project, are its efforts geared towards the disadvantaged members of rural communities? Are AMAREW's efforts linked in any way with the efforts of other projects operating in the Woreda such as, for example, Save the Children-UK's R2D?
- Are the technologies so far promoted by the AMAREW Project appropriate in responding to the priority development needs of the Woreda? What is the level of integration of AMAREW's efforts with the Regional development goals?
- The team has realized the presence of wide spread land renting practices in Yeku watershed. Are there any assessments done so far of the benefits they bring to farmers?
- The effort to introduce Barka goat breeds was started in 2004 but was stopped due to professional advise that such introductions should not be followed under conditions where there is no goat breeding policy. How did you engage in such introductions while the breeding policy is still not given?
- It has been repeatedly detected that WOARD has not been able to fully utilize its AMAREW's portion of the budget. Can you explain on that?
- Several success stories have been documented by AMAREW Project in the dawn of 2006. Which one of them have you attempted to introduce into this Woreda? Have you ever documented the number of rural community members that benefited from the endeavors that brought about the reported successes?

6.3.3.1 Response to the questions by the Woreda representatives

- Our extension activities are done based on an annual plan, which is partitioned into quarterly plans. Our planning exercise attempts to specify technological innovations that may respond to felt needs of our farmers.
- There are efforts to link interventions supported by AMAREW with other Projects. In this Woreda, we attempt to link Projects' efforts as of their planning stage and direct them to contribute in the areas of perceived deficiency. In this regard, we may cite the efforts made to link AMAREW's interventions with that of Save the Children UK's R2D. Interventions such as capacity building, restocking of goats, modern beehives, water harvesting structures, fuel-efficient stoves, gabion wire-boxes and, watershed management efforts are all linked up.

AMAREW's staff advisory inputs are relevant in shaping up the interventions of other Projects too.

- The greatest percentage of the tree species planted in the Yeku watershed is those that are adapted to drier environments. In the interest of experimentation we also planted tree seedlings that probably are not adaptable to the environment. We understand that closely working with the research center will improve WOARD's capacity of identifying tree species adaptable to the Yeku environment.
- Not only the Woreda but also the Zone administration is very well aware of AMAREW's efforts. We closely work with the Project staff, monitor field level activities and achievements by making scheduled visits.
- We highly value AMAREW's approach of engaging the WOARD and the Sekota ARC to fully assume responsibility of field level implementation as it ensures sustainability of Project achievements and empowers local staff and community to lead future development efforts.
- We also recognize the weak linkage between R-E at the Woreda and Zone level. The Zone has never received any report from the Sekota ARC for that matter. We didn't ask for it and they never came forward to tell us about their work. We also understand that R-E have to work closely to generate workable technologies that meet farmers' felt needs. Because the research system has well trained professionals they can even assist in building the capacity of our local staff. The situation has to be corrected without any further delay.
- There is no RELC at this time. RELC existed because of funding from IFAD. As the support from IFAD ceased RELC was cut short. Until RELC revives we may rely on FREGs as a short-term option to improve R-E linkages. We should however put our efforts together and reinstate RELC for enhanced R-E linkages.
- Due to absence of functional RELC we don't observe farmers' days. We rather follow a model farmer approach to which we give training and advisory services. The model farmer will have ten followers who learn about the technologies that we introduce on the model farmer's farm.
- AMAREW is beneficial to our Woreda in various aspects. It is building our capacity physically and, building the capacity of our work force, has introduced R-E approaches that lead to better outputs in watershed management (community empowerment) and adoption of technologies (on-farm experimentation), has introduced several technologies that meet needs of rural communities, etc. Although the Project is working in a few pilot communities it has demonstrated far-reaching achievements.
- The failure to fully utilize AMAREW's portion of our budget primarily emanates from the single pool budget use system and lack of banking service in Sekota town. The single pool system has been a hindrance to budget utilization due mainly to its poor purchasing performance. Note also that the nearest bank we do businees with is Woldiya.
- We have not done anything to extend the success stories reported by the AMAREW Project though we know that they make part of the 2005 annual report.

6.4 Recommendations on the way forward

- A scheduled quarterly review of AMAREW as well as other Projects operating in the Zone should be implemented. This will enable detecting and correcting discrepancies between plan and accomplishments, problems of R-E linkage and budget underutilizations, among others. The Zone as well as the Woreda administrations has to provide strong leadership in that regard. It is paradoxical to return unused budget while we operate in communities enduring extreme poverty situations. You should be able to reconcile this paradox, as the problem is from the side of the development worker and those leading the Woreda. We urge you to take this as an agenda and discuss over it in the forthcoming meeting of the administration team.
- Due to support from IFAD the REFAC was meeting twice in the crop reason, the first at full vegetative growth and the second towards crop maturation, and conducting field evaluations.

It was halted due to withdrawal of the IFAD budget. REFAC has to be reinitiated without further delay to be successful in our technology generation and promotion efforts. Conducting repeated workshops may not as such help us promote R-E linkages, we should rather move beyond that and be proactive to influence the Regional policy makers to understand the relevance of R-E linkages and institutionalize it. It may not be feasible to use funds from other sources such as AMAREW due to the high operational funding demand of REFAC. As it is a Project endeavoring to bring a paradigm shift in research-extension linkage, AMAREW should play the lead role in the effort of reestablishing a functional REFAC.

- FREGs should be established as appropriate at different locations without any further delay. They provide mechanisms of strengthening R-E linkages.
- The Woreda as well as the Zone bureau of agriculture should plan to benefit from the research center nearby. They can be good sources of knowledge and technology for the zonal development.
- All joint planning review schedules (Research-Extension to be supported by AMAREW) have to be done earlier than ARARI's annual review schedule. There is no harm for AMAREW to conduct its joint planning workshops earlier than December. Planning workshops should be synchronized well, better than what has been experienced so far. As completed research form, extension review, and research center level reviews are scheduled in the months of August, October and November, respectively, appropriate time for AMAREW's joint planning workshop is October. This joint planning schedule has to be practiced as of the coming Ethiopian New Year (1999).
- From what the evaluation team has observed today various researchable topics may be suggested to be picked up by Sekota ARC. These include (1) selection of adaptable tree species under the drier climate of Yeku, (2) identification of soil bund stabilizing technologies, (3) identification of technologies that enhance survival rate of trees planted under the watershed development effort and, (4) socioeconomic research to demonstrate contribution of tenure security in improving farmers' livelihoods. Such topics have to be researched in the forthcoming years.
- Because AMAREW promotes approaches that are farmer participatory, the administration should be able to respond to farmers' demand of not changing the earlier goat restocking methodology. Goat restocking should follow the earlier practiced goat provision revolving scheme whereby first level beneficiaries provide offspring to 2nd level beneficiaries and so on and so forth. You may request the Region for implementation modalities whenever you encounter contradictory implementation guidelines.
- We should be able to provide the WOARD and the Sekota ARC with full information on Barka goat breed introduction strategies.
- We strongly recommend to WOARD and the research center to document adoption rate of the various technologies promoted so far and come up with success stories.
- Whenever you encounter problems associated with community perception of development efforts like the one reported at Milda, you should be able to sort it out in a common forum where the administration, the WOARD, the research staff and communities participate.
- The achievements we observed at Yeku are encouraging. You should however focus on integrating crops of economic value into the watershed development scheme. Integrating crops such as Opuntia (with some reservation on its invasive nature), pigeon peas, cassava and sweet potatoes into the watershed development planting program should be given serious thought. Some of the above are also crops of strategic importance receiving high priority in the effort to make the 2.5 million food insecure regional population food self-sufficient. It is true that one should first work to improve the vegetation cover of such highly degraded areas. But while still trying to achieve this goal, you should always think in terms of enhancing the

food production capacity of rural communities. Decisions on which tree species and crops are appropriate for the watershed development should however be participatory.

- The physical water harvesting structures we observed at Yeku are impressive. With such water harvesting structures in place, it can be concluded that the amount of run-off has already diminished and water table recharging has increased. The ponds to develop thereof should be used for high value vegetable and fruit crops development. Lessons in this regard could be learnt from what has been achieved at Jarie (South Wollo Zone).
- The Woreda has to work hard to motivate rural communities to move towards economic diversification. The work is not simple as it involves changing mind sets. Communities have to diversify their economic activities, have to engage in off-farm activities to earn more, and should think beyond working under Safety Net programs to just earn Birr 30 a month. What is available as off-farm work in the Zone has to be assessed and communities be advised accordingly.
- Although the introduction, on the spot manufacturing and use of energy saving stove made one of AMAREW's success stories so far it is restricted in one Kebele. Only 58 HHs out of approximately 1000 or 6% are using energy saving stove. DAs were trained by the regional Energy Bureau to train and assist communities to manufacture and use energy saving stoves. The Woreda and the Zone have to join hands and facilitate scaling-up of the technology.
- As the AMAREW Project is only 1.5 years away from closing, it is high time to work on phasing out strategy. The Project office and appropriate bodies from the Woreda should come together to develop a phasing out guideline that ensures continuity of activities and sustenance of Project achievements.
- We have noted weak links in data collection and compilation of usable data. You should avoid such events and be strong in terms of providing readily available data related to ecological changes, economical changes, impacts on livelihood systems, etc. As far as you are not ready to report on comparative changes due to Project interventions (from where to where) and inputs and processes responsible for the changes it will be difficult to document lessons and scale-up achievements. The AMAREW Project office has to develop appropriate data sheet and reporting format, which will be completed by the field level implementers. Field level implementers have to be serious in documenting data and submitting reports on all interventions. In the absence of both quantitative and qualitative data it is impossible to track changes due to the intervention of the Project.
- Targeting of improved technologies should be done in a way that promotes synergy in the farm system. Small-scale farmers manage multiple farm enterprises but not a single enterprise, due to this, apiculture, small ruminant, crop, etc. technologies should be combined and given to single beneficiary to improve performance of the farm system and promote interrelations among the multiple enterprises of the farm. Moreover, technological interventions should not be thinly spread. We suggest focusing on few selected technologies that bring lasting changes and work with few selected farmers for stronger Project impacts.
- AMAREW being a food security project, targeting should primarilyconsider those eligible for a Safety Net Program or mainly the disadvantaged members of the community.
- We have noted the less attention given to periodically evaluate the performance of the AMAREW Project. Monitoring and evaluation is a no choice option to note if projects are performing as planned and moving towards achieving their goal. You have to undertake a planned M & E.
- Generally we are impressed with the achievements at Yeku watershed. We however recommend to you to engage all stakeholders, meaning the community, Kebele leadership, concerned sector organizations to work together towards the watershed development. Assist the community to develop watershed management bylaws to ensure sustainability of achievements.

7. Day 4: Gubalafto Woreda
(August 7, 2006)

7.1 Field Visit: Lenche Dima Integrated Watershed Management Site

7.1.1 Explanation by the WOARD team

The watershed covers over 1500 ha of land. Integrated development interventions of the AMAREW Project include: (1) Rehabilitation and development of natural resources (Fig. 11) and water harvesting systems, (2) Promotion of improved livestock technologies including restocking of goats and day-old chicks distribution, and (3) Promotion of different improved crop technologies. The approach in watershed development is to treat degraded lands and assign portions to individual community members under a usufruct right.

In terms of benefits to the community the following could be cited: (1) allocation of treated and rehabilitated land to landless community members under a usufruct right. Such community members have gained Birr 150-200 per person from sales of cut grass in the 1st year (2004/05) and about Birr 400 per head in the 2nd year (2005/06). Some have benefited from sales of fruits of mangoes and papayas (Fig. 12).

A committee established by the beneficiaries controls those who may show reluctance and not properly contributing to the development of the catchments once they received land. In any one planting season the activities of the beneficiaries are done based on pre-developed and agreed upon plans. The beneficiaries may, for example, agree to dig 200 planting holes per head on their private holdings and the one who is not achieving the targeted goal for reasons other than health problems will be fined.

Fig. 11. Rehabilitated closed area in Lenche Dima watershed, Gubalafto

7.1.2 Highlighted Capacity Building Interventions

Long-term degree (4 BS) and several short-term in-service trainings have been offered to WOARD staff and selected farmers and community leaders. Selected community members received training on energy saving stove production, and on gabion wire box making to be able establish small-scale micro-enterprises. About 17 WOARD staff has received training on FREG.

7.1.3 Highlighted Extension Component Interventions

- Extension interventions in Lenche Dima Pilot watershed include restocking of goats, introduction of improved poultry production, fruit and vegetable culture and other crops of economic importance. In the area of poultry, the day old chicks hay brooder technology is largely promoted, whereas the goat restocking practice involved provision of 5 nanny and one buck goat to selected individual HHs. The number of beneficiary HHs and total number of goats and day-old chicks given is indicated in Tables 4 & 5. Further discussions with sample beneficiaries revealed that the day-old chicken extension did not hit the intended target and was a failed opportunity. Details on the cases are given in Box 1.
- Another intervention area was the promotion of energy saving stove. What has been achieved in this regard is given in Table 6.

Box 1: About the Day-Old Chicken Technology

On Ato Dessalew's farm

We received 40 day-old chicks in a hay-brooder. Only 16 grew and the rest died. But the chickens were horrible scavengers and were about to destroy our home garden when we disposed them. Because we preferred our home garden to the chickens we sold them all and don't have anymore now.

On Ato Mohammed's farm

My farm received 40 day-old chickens with a hay brooder technology. Six of them died on their way to the farm. Many more died while growing and I eventually got 20 grown ones. Wild cats ate five of them, and another five perished for unknown reason. Six layers and 4 broilers reached the reproductive stage. Out of these, predators ate 3 layers and 2 broilers and I was finally left with 2 layers and 2 broilers. They laid eggs and I got 10 chicks hatched. But unfortunately I lost almost all to predators. Team members were perplexed of what they heard and concluded that the extension was not done properly.

Fig. 12. A farmer in Lenche Dima watershed posing near his fruiting mango plant that he got through the AMAREW Project

Table 4. Number of beneficiary HHs and goats given through a revolving scheme in Lenche Dima watershed (2003/04-2005/06)

Year	Number of beneficiaries			Number of goats	Remarks
	Male	Female	Total		
2003/04	88	6	94	288	3 goats/farmer
2004/05	59	5	64	384	6 goats/farmer
2005/06	9	2	11	66	6 goats/farmer

Table 5. Number of beneficiary HHs and day-old chicks with hay brooder technology given through a revolving scheme in Lenche Dima watershed (2003/04-2005/06)

Year	Number of beneficiaries	Number of day-old chicken	Remarks
2005/06	11	550	One hay brooder per HH with 50 chicken

Table 6. Number of trained community members and number of energy saving stoves in use in Lenche Dima watershed

Year	Number of trained community members			Number of stoves in use by trained members	Number of stoves in use by non-trained members
	Male	Female	Total		
2004/05	6	44	50	50	50
2005/06	5	25	30	30	4

7.1.4 Highlighted Watershed Component Interventions

- Goal is to develop over 1500 ha of the catchments through area closure, tree plantings, natural regeneration, run-off control, etc. For example, in 2005/06 about 175 ha degraded land was treated, partitioned into individual plots and allocated to 303 members of the community (Table 7). Landless community members to whom the treated land is allocated earlier than 2005/06 are already getting economic benefits (Table 8). What has been done in 2005/06 in terms of catchments rehabilitation work is also given in Table 9. Farmers to whom such treated land is allocated are also advised and guided to plant the fast growing Eucalyptus for more economic benefits.
- The attempt to develop forage on terraces and rehabilitated gullies is already yielding good results. Pigeon peas are planted on terraces covering over 50 ha, whereas *Sesbania* is planted on about 2.5 ha rehabilitated gulley.
- A number of dome shaped water harvesting structures were built for private use on individual holdings all along the Project years (Table 10). Using the water stored in the domes the owners, beyond using water for household consumption during the harsh dry season, are growing different cash crops (mangoes, papayas, avocadoes, oranges, coffee, cabbages and onions) in their home gardens (Table 11). Box 2 gives case of Ato Dessalew's farm whose farm is changing due to the Project and his innovativeness.
- One water tanker and one generator house have been built with the financial support of the Project for the community in the watershed. In addition, generator maintenance work has been done and water points for human use were developed at 6 locations. A pipeline system has also been developed.
- Community members were organized and trained to make gabion wire boxes at the site of performances under the MED component of the project. That avoided purchase from distant locations and minimized costs due to gabion by more than half. So far a collective action group of 6 community members made 29 gabions for the project's use.

Box 2. Visit of Ato Dessalew's Farm

The team visited At Dessalew's farm who is identified as one of the innovative farmers whose farming is changing due to Project and his effort. Although Ato Dessalew was not present during the visit, his wife confidently answered all the questions raised by the evaluation team (Fig. 13).

With a material support from the Project they built a $60m^3$ capacity dome to collect water to which they installed a pipe system to collect drinking and irrigation water. They have planted 14 bananas, 10 papayas, 7 coffee, 5 mangoes, 5 avocadoes and several chat plants in their home gardens which otherwise could have only been put into use in the rainy season to produce sorghum. When the fruits grow we expect to get good return. We also grow a few vegetables for home consumption. Not only that but also we are using the water for home use said the lady.

In the rehabilitated gulley facing our farm we have planted the eucalyptus trees that you see and are expecting good return from that too.

Fig. 13. Ato Dessalew's spouse explaining about (1) the misfit between scavenging backyard poultry and backyard fruit and vegetable production (2) the benefits accrued on their farm due to the interventions of the AMAREW

Table 7. Closed area (ha) and number of land short or landless community members to whom closed area is allocated under a usufruct right in Lenche Dima Watershed

Year	Area closed (ha)	Closed area divided (ha)	Number of community members to whom land is allocated	Remark
2003	10.5			
2004	75	29	44	Farmers organized into groups
2005	70			Farmers organized into groups
2006	113	85	171	
Total	**268.5**	**114**	**215**	

Table 8. Economic benefits accrued in 2004/05 and 2005/06 from grass sales by 44 former landless community members at Lenche Dima watershed

Year	Number of farmers	Average income per head from grass sales (Birr)	Total Income (Birr)
2005	44*	150	6,600
2006	44*	300-400	13,200

*The same farmers

Table 9. Catchments rehabilitation work done in 2005/06 at Lenche Dima watershed through Project and Safety Net inputs

Type of work	Due to project	Due to safety net	Total	Remarks
Mountain side terraces (km)	172	-	172	
Stone terraces (km)	2.5	-	2.5	
Water retaining holes (no.)	1046	-	1046	
Trenches (no.)	963	-	963	
Half-moon (no.)	12,940	38,425	51,365	
___ holes (no.)	25,000	192,125	217,125	
Gabion terraces (m^3)	384	-	384	96 gabion boxes
Seedlings planted	105,000	-	105,000	Out of planned plantings of 200,000 (due to delay in rains)

Table 10. Number of dome shaped water harvesting structures built on individual holdings in Lenche Dima watershed (2004/05-2005/06)

Year	Number of domes	Number of owners	Remarks
2004	5	5	
2005	10	9	
2006	4	4	3 still under construction
Total	**19**	**18**	

Table 11. Crops grown and benefits accrued from water harvested in dome shaped water harvesting structures in Lenche Dima watershed (2005/06)

Crops grown	Number of farmers	Income per farmer (Birr)
Cabbage	2	400
Onion	1	150
Onion	1	300
Tomato & sweet potato	1	175
Mangoes	1	300

7.1.5 Highlighted contribution of research towards watershed development

- The Sirinka research center has led several participatory evaluations of crop technologies. These included evaluations of improved cultivars of groundnut, sesame, cotton, and sorghum, crop protection technological options, etc.
- It is testing technologies that enable better finger gulley and main gully treatments. The technologies being tested include physical options (check dams with sand-filled bags, stone bunds) and, biological options (planting fast growing shrub species).
- It is also leading a study to recommend planting methods that result in better seedling survival and, relationships of planting methods with species survival rates. A study underway is the relationship between eyebrow vs. species survival condition.

7.1.6 Community members' assessments of benefits due to the interventions

- The AMAREW Project is working in the Lenche Dima watershed since 2003. It has introduced community centered watershed development which brought about an observable change in the Lenche Dima watershed which was a highly degraded watershed characterized by extremely high erosion and, extended gullies. Due to area closures and gully treatments, increased canopy coverage resulted from enhanced natural regeneration and due to tree plantings. Run-off is controlled and the effort is showing signs of increased infiltration and rising water table.
- Due to the Project's restocking endeavor individual goat holdings and total goat population in the watershed has increased. The in-kind revolving scheme the Project introduced enabled disadvantaged community members to own goats without committing to paying interests which sometimes could be inhibitory in rural credit schemes.
- Innovative inhabitants of the watershed are now engaged in small-scale vegetable and lowland fruit production using harvested rainwater stored in the dome shaped structures. Due to lack of water and knowledge such activities were not known in Lenche Dima earlier and all are outputs of the Project.
- Prior to the establishment of the Project the community was getting its water by traveling up to 6 hrs distance particularly in the dry season. Beyond being a big burden on the women members of the community to fetch water from such distant places over which the community has no control was also a cause for various diseases due to its uncleanness. This time the community has access to clean water nearby and that was one major achievement of the Project.
- The Project's approach including (1) empowerment of the community to lead the watershed development efforts, (2) allocating treated land to individual community members under a usufruct right, (3) working through the WOARD, (4) requiring the allocation of a separate DA to follow on Project activities, (5) efforts to integrate high value crops (mangoes, papaya, cabbage, etc.) are all innovative which motivated the community to move forward with the Project.

7.2 Day's Evaluation Wrap up Meeting at Woldiya WOARD Office, August 7, 2006

At the start of the meeting, an explanation on the team's mandate and interest was given by the Evaluation Team Chairman. The below stated series of questions were then posed by the evaluation team in the interest of widening its understanding, identifying strengths and limitations and set recommendations on the way forward.

Question: Are there any lessons learnt from what has been done and achieved in the Lenche Dima watershed that the Woreda has furthered elsewhere?

Answer (WOARD): There are several lessons from the watershed that could be scaled-up to develop similar other watersheds. These include, among others, (a) the effectiveness of the dome shaped water harvesting structures, (b) main gulley and gulley head treatment technologies that gave demonstrable results within a short period, (c) the approaches towards MED as seen with the group organized for gabion wire box production, (d) approaches towards successful area closures, (e) choice of technologies that help disadvantaged community members to own assets within a short period of time, and above all (f) approaches that encourage community participation and sense of Project ownership and the relevance of working hand in hand with other concerned sector offices to speed up the

move towards set Project goals. Although there are such large workable lessons, no scaling-up work has been done so far except in terms of sharing the lessons with other stakeholders for their future use. In this regard the World Environment Day (January 5, 2004) was observed at Lenche Dima and the NGOs represented at the event appreciated the achievements and the approach that brought these achievements and showed keen interest to follow along the same line in their future endeavors.

Question: Are there any specific technologies with demonstrable potential in the watershed that could be scaled-up to other areas with similar problems? Is there, for example, any plan to scale-up opportunities such as growing sesame and groundnuts the adaptation and the economic returns of which has already been confirmed by research?

Answer (Sirinka RC): Technologies with demonstrated potential for scaling-up are specified through higher degree studies (one PhD and one MS studies) in terms of the economic benefits they brought to the farming community that adopted them. That information could be used as a decision support in future scaling-up efforts.

Question: What is your assessment of the linkages between R-E as of the planning to the execution stage? Any demonstrated improvements due to the Project?

Answer (WOARD): There is no meaningful change in R-E linkage systems that occurred after the Project. WOARD has never requested Sirinka RC to be part of its annual developmental work. In the same way Sirinka RC has never taken the initiative and come forward to be part of our work.

Answer (Sirinka RC): In terms of R-E linkage even though it still leaves much to be desired, we believe that forums that were not available earlier are available now and what remains is for one to knock on the door of the other to discuss issues of common concern.

Comment (Sirinka RC): One problem that we were facing all along was the mismatch between the research system, the extension system and AMAREW's planning review schedules. That has to be improved to come up with better joint planning of Project activities in the remaining time of the Project.

Question: The AMAREW Project, in addition to its support to the integrated watershed development, also supports extension endeavors in three pilot extension PAs in the Woreda. What achievements are recorded so far?

Answer (WOARD): Several income generating interventions have been made in AMAREW's extension PAs. These included (a) introduction of improved poultry production through the day-old hay brooder technology, (b) introduction of Washera sheep to improve performance of the local sheep types, (c) improved energy saving stove production, marketing and use, (d) introduction of improved bread wheat cultivars through a revolving seed scheme. Just to cite examples of economic benefits there are farmers who are currently selling up to 150 eggs a week and together with chicken sell making up to Birr 400 a month. Due to the bread wheat technology yield has grown from 1.1 t to 1.6 t ha^{-1}. In addition to such economic activities large natural resource rehabilitation work has been done in the extension PAs including terracing and tree planting of up to 165,000 seedlings. The reported survival rate is about 75%. In general, there are demonstrated changes in farmers' livelihoods in AMAREW's pilot extension PAs due to the introduced technologies.

Question: The WOARD has always been underutilizing its AMAREW portion of the budget. This has been discussed as a major agenda at a 'Woreda Level Implementation Assessment Workshop of the AMAREW Project held Woldiya from October 15-16, 2006. Did your budget use improve since then? Are there any demonstrated improvements?

Answer (WOARD): Regarding budget use, better performance has been recorded this year compared to any other time. So far we have utilized about 168,000 birr or 48% of the annual budget. Since we are no more restricted to operate under the single pool purchase system we believe that our burn rate will further improve.

Answer (Admin): Our Woreda was behind the planned budget use schedule because of the single pool financial administration system. That was a serious drawback to implement activities as scheduled. As this system is now revoked, we believe that our budget use will largely improve.

Question: What are the recommendations made by the research in terms of adaptable tree species selection for the watershed rehabilitation work? Have you made any studies to understand the survival rate of seedlings planted?

Answer (Sirinka RC): Our major focus so far was to assist the physical work towards gully and degraded catchments rehabilitation. Accordingly we are also conducting seedling survival rate study on rehabilitated gullies and catchments.

Question: Do you advise farmers to support their planting decisions on rehabilitated land? We observed eucalyptus trees plantings on reclaimed gullies now owned by individual farmers - Which crops should be planted on rehabilitated gullies from the point of view of the alluvial soil they contain, eucalyptus or fruit crops?

Answer (WOARD): In terms of tree species selection the focus made on eucalyptus is due to farmers' needs. The community so far gets construction poles from distant places with high price. It is, therefore, the community's choice to plant eucalyptus because of the high price it fetches. Regarding survival rate, there is no any study done so far. We just expect the survival rate for eucalyptus to be higher due to the increased water availability up hill as a result of increased infiltration rate due to the different water harvesting structures and vegetation cover increase as a result of area closure.

Question: What sources of resources did the Woreda use to support catchments rehabilitation efforts at Lenche Dima, Safety Net, R2D, AMAREW Project, etc. and how is the resource use coordinated?

Answer (WOARD): Mix of resources are used in catchments development efforts including the R2D, AMAREW financial assistance, and Safety Net. The resources are all utilized to achieve one major goal which is the development of the Lenche Dima Pilot watershed.

Comment (Sirinka RC): There are conflicting issues related to Project resource use by different partners (WOARD and Sirinka RC) that pay different rates for the same type of work done at the same site of performance. For example, whereas the 1 hr pay rate by WOARD for community labor engaged in physical catchments rehabilitation work is 3 kg wheat grain, for the same type of work done at the same site Sirinka RC could only pay a daily wage of Birr 5. This has become a source of misunderstanding among the labor force. Some type of payment standard has to be put into practice.

Question:	Are there initiatives and work done towards issuing land certificates? Are there any lessons that could be taken elsewhere?
Answer (WOARD):	Work done in the area of land administration and use include boundary demarcation and conflict resolution, distribution of reclaimed land to the landless youth workforce and activities leading towards land certification. The major lesson to be drawn relates to our experience of land distribution to the landless. That was relevant not only in making the landless economically viable but also in ensuring the sustainability of the watershed development efforts.
Question:	After receiving the training, have you formed FREGs?
Answer (WOARD):	We didn't form any FREG this year be it at Lenche Dima or the AMAREW's extension PAs mainly due to human power shortages. We have planned to follow on that without much further delay.
Answer (Sirinka RC):	We were not able to assist in the formation of FREGs in Lenche Dima watershed and any of the extension PAs in Gubalafto. This happened due to manpower and time shortage as the season advanced and we were spread too thin in different locations. We finally decided to postpone that of Lenche Dima and the extension PAs and to consolidate our efforts on strengthening the two FREGs formed in Tehuledere Woreda during the FREG training and the one we formed at Sirinka upon our return from the training.
Question:	What is the level of leadership and follow up provided by the Woreda administration towards the AMAREW and other Projects operating here, particularly in terms of ensuring linkages among different projects? Did the Woreda administration team evaluate performance of projects in its quarterly review meeting?
Answer (Admin):	The Woreda administration team knows all about the AMAREW Project, although it didn't so far as such consider the Project in its quarterly implementation review meetings. Projects operating in the Woreda are evaluated by the sector to which they belong. So we considered quarterly evaluation of the AMAREW Project to be handled by the WOARD.
Question:	Was the AMAREW Project relevant in assisting the development goals of Gubalafto Woreda?
Answer (Admin):	The AMAREW Project generally is an asset for Gubalafto Woreda not only in terms of the technologies brought in but also in terms of the participatory approaches it promoted towards watershed development and above all the implementation strategy including the decentralized budget use system it introduced.
Comment (Admin):	Although we understand the relevance of the Project to our area and appreciate its demonstrated achievements in terms of watershed development, we are still concerned why its area coverage remained so small all along the past 4 years in view of the big resource it allocated in terms of budget, logistics and technical advisors?

7.3 Recommendations on the way forward

- The WOARD has met its commitments made during Project appraisal by allocating a DA to specifically follow Project activities in the Watershed. It did a great job in that regard and deserve a compliment. Most of the success stories observed in the watershed may be difficult to come by without the close follow up provided by the DA.

- The progress made through years from only rehabilitating smaller catchments to rehabilitating larger catchments by convincing communities is good practice which needs to be followed in future scaling-up efforts. Farmers believe in what they see and not much in what they hear. The fact that communities allocated larger parts of the mountains for enclosure is because of observing the benefits from earlier closed areas.
- Commendable work has been done in terms of enhancing community's access to clean drinking water. Attention should be given to upgrading or maintaining the water pump which is giving the community troubles due to its weak capacity. That, as we understood during our field visit, represented one major felt need of the community.
- Effective and efficient work has been done in terms of establishing physical water harvesting structures. The effort made in promoting the dome-shaped water structures is yielding encouraging results. Efforts should be further consolidated in the area of water harvesting, as water is one of the major determinant of livelihood systems in Lenche Dima watershed.
- In terms of tree species selection for planting and where to plant what, one should make more of an informed decision by considering factors such as fast canopy coverage, water use efficiency, better economic returns, etc. All that will add up to positively or negatively impact sustainability of the achievements.
- Joint planning review schedules (Research-Extension to be supported by AMAREW) have to be completed earlier than ARARI's annual review schedule. As recommended for Sekota, AMAREW should be able to conduct its joint planning workshops earlier in September October as of the coming Ethiopian New Year (1999).
- Because Lenche Dima is a model watershed development site, formation of FREG should have not been delayed at any account. WOARD and Sirinka RC should join hands to form the FREGs without any further delay.
- As Lenche Dima is a model watershed site, serious thought should have been given to the issuance of land certificates. Because it is the key for sustainability of achievements, actions that speed up the certificate issuance should be taken without any further delay.
- The data recording in Lenche Dima is better than any of the sites the RIT visited so far. However, the data appraisal and recording system still needs improvement and the Project office should follow on that, as recommended for the other sites. For example, there has to be a baseline data against which current achievements could be compared. Data should show where the project started and where it reached, together with the inputs responsible for the changes. For better understanding it is necessary to show the budget utilized including expressing community labor in money terms. Such data may better be appraised by dividing the 1500 ha catchments into manageable size smaller sub-catchments. Data from the three extension PAs is however poor. WOARD should be able to generate and compile usable data from the extension PAs that show impact of the Project. The Woreda can seek advises from the TAs of the Project, they are there to serve such purposes.
- Rigorous effort should be made towards identifying, delineating and standardizing all success stories in a way that facilitates scaling-up. For example, from the experience you gained you should be able to standardize the dome-shaped water harvesting structure as it fits drier areas.
- An aggressive technology popularization scheme should be designed and followed for those technologies that are rated more appropriate. For example, introduction of mango variety that reached reproductive stage in two years should be done aggressively to cover large areas.
- All Project stakeholders should come together and develop Project phasing out strategy with a focus on how to sustain current achievements in watershed development.
- Budget utilization is still poor. If WOARD has so far not even fully utilized 40% of its allocated budget, it means that it will have problems to utilize the remaining 60% of the budget in the short time (one quarter) remaining for the year to come to close. You should

consider scaling-up of relevant and workable technologies to similar areas and make use of the budget accordingly.

- The R-E linkage is still weak. The Project and its partners should work towards developing guidelines including setting activity time tables. By now linkage should have appeared part of the value system of Project partner institutions. When to plan, when to implement, who does what, when to observe field days, what constraints limit performance, which constraints should receive research attention, etc. should be understood by all employees of partner institutions and all should work towards their realization. That is what linkage means in reality; otherwise it will remain as rhetoric as it was.
- Distributing treated land to the landless is good practice provided that it is done in a participatory manner. During implementation make always sure that the distribution is done equitably, meaning that consider landless women, the elderly and the like in addition to the youth that you have so far considered.
- The extension weakness observed with the day-old chicken hay-brooder technology introduced in Lenche Dima watershed should be corrected and beneficiary farmers should pass through rigorous training on the use of the technology and on providing optimum management prior to their receiving the package. The lack of extension support has surfaced out as a critical drawback in terms of other technologies too. We strictly recommend that extension should provide maximum follow up and support for any technological intervention to become successful.
- Targeting farm HH for improved technologies should be done in a way that brings synergy in the farm system. Small-scale farmers manage multiple farm enterprises but not a single enterprise, due to this, technologies that fit into the different farm enterprises the HH is managing should be combined and given to the same to improve performance and encourage interrelations among farm system components.
- AMAREW being a food security project those targeted for its resources should, to the best of your ability, be disadvantaged members of the community that are eligible for a Safety Net Program. This should be the leading principle in recruiting community members to participate in watershed development works, as well as to select those to benefit from technological interventions.
- The evaluation team has noted the absence of periodical (quarterly) evaluation of the performance of the AMAREW Project. Instituting such value system of M & E could very much help to timely detect and respond to urgent community demands. For example, such procedures would have helped to respond much earlier and much better to the resource related limitations that the Safety Net Program encountered.
- Finally, related to the request made to expand project intervention areas for better and efficient resource utilization, the RIT will pass on decisions in its forthcoming meeting and notify the Woreda how to go about it.

8. Day 5: Sirinka Research Center
(August 8, 2006)

8.1 AMAREW Project supported on-farm research

The AMAREW Project focal person explained that the AMAREW Project so far supported 37 projects of which 5 are completed, 20 are on-going and 12 are new projects to be implemented this season. The completed projects are the ones described below:

- **Sorghum:** evaluation and dissemination of Striga resistant improved sorghum cultivars viz. Abshir, Berhan and Gubyie (Tables 12 and 13) and, improved early maturing sorghum cultivars, viz., Teshale and Yeju (Tables 14 and 15)) in Kobo-Girana valley. Seed multiplication was carried on for the cultivars selected by farmers and was distributed to over 1,000 farmers.
- **Groundnut:** pre-extension demonstration of improved groundnut cultivar, viz.., Shulamith in Lenche Dima (Table 16),
- **Sesame**: performance evaluation of a white seeded improved sesame cultivar, viz., Adi was carried on in Lenche Dima and its environs (Table 17),
- **Cotton:** Adaptation and performance evaluation of improved cotton cultivars, viz., Cu okra and Delta Pine was done in Lenche Dima (Tables 18 and 19), and
- **Irrigation:** demonstration and evaluation of the rope and washer pump technology. (Fig. 14)

Farmers in Delanta area have also largely benefited from improved wheat seed extension supported earlier by the AMAREW Project.

Table 12. Mean grain yield of improved Striga resistant sorghum cultivar (Berhan) technology on farmers' demonstration plots

Treatments	**Mean grain yield**						
	Year I			**Year II**			
	Kobbo	Cheffa	Sirinka	Mehalamba	Girana	Libso	Hara
Local + farmers' management	2,200	2,000	2,000	3,750	3,500	3,200	1,380
Berhan	3,200	3,000	3,100	3,880	4,500	4,160	2,000
% increase of Berhan over local	31%	33%	36%	4%	22%	23%	31%

Table 13. Economic benefit for Mersa Woreda, Berhan vs Local cultivar of sorghum

Description	**Improved**	**Local**
Benefits		
Average yield (kg ha^{-1})	3,400	2,500
Adjusted yield (kg ha^{-1})	3,200	2,300
Gross field benefit (Birr)	6400.00	4600.00
Costs that vary		
Cost of seed (Birr)	20.00	30.00
Cost of fertilizer (Birr)	340.00	0.00
Cost of labor to apply fertilkizer (Birr)	80.00	0.00
Total cost that vary (Birr)	440.00	30.00
Net benefits (Birr)	5960.00	4570.00
Marginal net benefit	390.00	
MRR	3.4	

Table 14. Mean grain yield of improved sorghum cultivars (Yeju & Teshale) technology on farmers' demonstration plots

Treatment	**Mean grain yield (kg ha^{-1})**			
	Cheffa	Sirinka	Mersa	Kobbo
Local + farmers' management	2,400	2,000	2,200	2,300
Teshale	3,800	3,200	3,500	4,000
Yeju	3,200	3,000	3,600	3,500
% increase of Yeju over local	25%	33%	39%	34%
% increase of Teshale over local	37%	38%	37%	

Table 15. Economic benefit for Mersa Woreda, Teshale and Yeju vs Local cultivar of sorghum

Description	**Teshale vs Local**		**Yeju vs Local**	
	Teshale	**Local**	**Yeju**	**Local**
Benefits				
Average yield (kg ha^{-1})	3,600	2,350	3,250	2,350
Adjusted yield (kg ha^{-1})	3,400	2,200	3,000	2,200
Gross field benefit (Birr)	6800.00	4400.00	6000.00	4400.00
Costs that vary				
Cost of seed (Birr)	20.00	30.00	20.00	30.00
Cost of fertilizer (Birr)	340.00	0.00	340.00	0.00
Cost of labor to apply fertilizer (Birr0	80.00	0.00	80.00	0.00
Total cost that vary (Birr)	440.00	30.00	440.00	30.00
Net benefits (Birr)	6360.00	4370.00	5560.00	4370.00
Marginal net benefit (Birr)	1990.00		1190.00	
MRR	4.85		2.92	

Table 16. Mean grain yield of improved groundnut (Shulamith) technology on farmers' demonstration plots

Treatments	Mean grain yield (kg ha^{-1})			
	Gedober	**Ayub**	**Kobbo**	**Location mean**
Local + farmers' management	2,900	2,800	2,800	28
Shulamith + improved management	3,700	3,200	3,600	35
% increase of Shulamith over local	28%	14%	29%	24%

Table 17. Mean grain yield (kg ha^{-1})of improved sesame cultivar (Adi) on farmers' demonstration plots in 2004 and 2005

Location	Year I				Year II			
	Farm 1	**Farm 2**	**Farm 3**	**Location mean**	**Farm 1**	**Farm 2**	**Farm 3**	**Location mean**
Mersa	900	800	900	8.7	800	800	900	8.3
Lenche Dima	500	-	600	5.5	600	700	600	6.3
Kobbo	800	600	-	7.0	500	600	500	5.3

Table 18. Mean lint yield (Kg ha^{-1}) of improved cotton cultivar (Cu okra) on farmers' demonstration plots in 2004 and 2005

Location	Year I				Year II		
	Farm1	**Farm2**	**Farm3**	**Location mean**	**Farm1**	**Farm2**	**Location mean**
Mersa	2,500	2,700	2,200	2,466	-		
Lenche Dima	2,400	-	2,300	2,350	580	1,150	860
Kobbo	-	-	-	-	630	1,640	1,100

Table 19. Mean lint yield (Kg ha^{-1}) of improved cotton cultivar (Delta pine) on farmers' demonstration plots in 2004 and 2005

Location	Year I				Year II		
	Farm1	**Farm2**	**Farm3**	**Location mean**	**Farm1**	**Farm2**	**Location mean**
Mersa	2,400	2,490	2,300	2,396	-	-	-
Lenche Dima	2,200	-	2,200	2,200	440	791	620
Kobbo	-	-	-	-	390	1,640	1,000

8.2 Research-Extension-Farmer Linkages

- In early 2006 attempt has been made to make joint R-E planning including for determination of constraints requiring research-extension attention and to plan implementation of planned activities.
- Two FREGs have been established in Kebele 015 (Godguadit) Tehuledere Woreda in June 2006 with an active involvement of Research-Extension and Farmers. In Gubalafto Woreda FREG has been established in Ameya Mecha, one of the three AMAREW Project extension intervention pilot sites. The center was, however, not able to lead the establishment of FREGs in Lenche Dima watershed due to time and

staff shortage. Related to promoting FREGs Sirinka RC has already developed and made available ToR.

- There is a good two way communication with the watershed committee at Lenche Dima.

But due to absence of defined structural linkages the attempts so far made revolve around functional linkages that depend on the initiatives and motivations of individuals. What AMAREW is attempting to promote at the Woreda level is the development of such functional linkages in the absence of any abiding policy statements or guidelines.

Fig. 14. Demonstration of the Rope and Washer water lifting device at Tehuledere Woreda by Sirinka Research Center

Following the presentations, a discussion forum was opened whereby questions were forwarded by the RIT evaluation team and explanation was given by the research staff: (Fig. 15)

Question: How do you define the research-extension-farmer linkage system in place? Is the research system represented at the extension annual planning workshops and vice versa? Did the research center participate in and contribute towards the realization of AMAREW Project supported extension activities? How is the timing for the research-extension Woreda

level review? Do you, for example, undertake meetings at a specified time period agreed by all stakeholders?

Answer: So far, despite the efforts from AMAREW, there is weak integration of research-extension activities at the Woreda level. Review of all CIDA supported projects is done well ahead of the center review schedule which takes place in November. On the contrary, AMAREW Project supported activities are reviewed after the center as well as regional research review schedules. In 2006 AMAREW has led two workshops, the first held in December 2005 which was a joint planning workshop and the latter held in March 2006 which was an implementation workshop of already planned activities. Although the research-extension integration was so far weak, in terms of promoting functional linkages, we sincerely believe that we are in the right track. To achieve more, the groundwork that leads towards provision of a policy framework for structural linkages has to be worked out.

Comment: The review timing for AMAREW Project supported Research-Extension activities has to be rescheduled to accommodate the concerns of the research system and bring together both Sirinka RC and WOARD in the same review forum. AMAREW's review schedule has to be brought forward towards end of September of each year to accommodate the planning schedules of both the research and extension systems.

Comment: Earlier when IFAD was financing the activities of REFAC there was better move towards R-E-F linkages. During that time all joint field evaluations were scheduled and implemented in September/October, whereas joint planning exercises were carried out in November-December following harvest. But as IFAD financing ceased in 2005, REFAC activities had to be stopped due to lack of budget. Neither BoARD nor the research system took the initiative to seek ways of reinitiating REFAC.

Comment: One other problem we had to properly execute activities planned under the AMAREW Project is DAs demand for top-up salaries. DAs threaten us that they are not ready to collect field level quantitative data unless they are paid top-up salaries for doing it. Due to distance and inaccessibility the Research Center does not have its employees working in AMAREW's extension PAs. The research, therefore, entirely relies on DAs to collect data from its on-farm trials. We are not sure how far we can go to accommodate DAs demand. The WOARD did not help us to resolve this issue let alone assigning DAs to specifically take-care of activities under the AMAREW Project.

Question: What are the technologies that may be picked by the extension system for further diffusion? What are the wheat and sorghum production technologies obtained from research that farmers are using currently? How many farmers have adopted these technologies? How many quintals of improved sorghum seed did the research multiply and distribute to farmers? What are the on-farm yield improvements of wheat and sorghum due to the use of the improved technologies? What economic benefits did farmers get from these technologies?

Answer: There are several technologies that are verified on-farm which may be picked by extension for further diffusion. Such technologies that are readily available include (1) improved crop cultivars of sesame, groundnut, cotton and sorghum; (2) crop protection technologies including integrated striga management and maize stalk borer management technologies; and (3) the rope and washer pump irrigation technology. Regarding the rope and washer pump Sirinka RC has distributed 29 pumps in Tehuledere Woreda. Because the technology is appropriate, Kalu Woreda, based on their assessment of the performance of the technology in Tehuledere Woreda, manufactured about 640 rope and washer pumps and distributed them to the same number of farmers.

Complete information on what has been achieved due to the dissemination of striga resistant early sorghum cultivars and on number of farmers currently using the technology could be obtained from the thesis work of Ato Yigezu A. Yigezu entitled '***Technological and Policy Changes for Improving Farmers' Welfare in the Amhara Region (Ethiopia)***'.

Question: Underutilization of budget was one of the drawbacks that characterized all AMAREW Project partners. What does your budget use look like this year?

Answer: In 2006 we have improved our burn rate. Good portion of the budget has been utilized for hiring seasonal labor and for vehicle maintenance as planned.

Questions: How is the performance of the AMAREW Project in terms of building the capacity of the research center?

Answer: The center has benefited a lot from the capacity building component of the AMAREW Project in terms of long term degree training (BS and MS), short term trainings (Inductive training, FREG training, training on statistical packages (SAS and SPSS), training on laboratory instrumentation and maintenance (soil lab)., study tours (in-country and overseas). At this juncture the center would like to request the AMAREW Project to support a TA assignment to revitalize the center's crop protection laboratory as it did for the soil laboratory.

Fig. 15. Discussion session of the RIT evaluation team and the research staff at Sirinka Research Center

8.3 Recommendation on the way forward

- The REFAC has to be reinitiated as of this season at least in AMAREW Project pilot intervention Woredas using some portion of the AMAREW budget allocated to each WOARD and RC. The achievements in these Woredas in terms of R-E linkages may be used to influence the regional policy makers to work towards institutionalizing R-E-F linkage systems. Moreover, in all AMAREW Project supported pilot Woredas joint research-extension-farmers planning has to be accomplished as of the coming Ethiopian year 1999. We have to show by working in the pilot Woredas that undertaking joint planning provides better opportunities to address the developmental needs of the Woreda proper.
- All technological innovations that have been evaluated and approved for meeting farmers' needs should be scaled up and scaled-out. Both the research and the extension systems should join their efforts in the remaining Project time and work on scaling-up and scaling out of those technologies with proven potentials. This has to be done for the technologies that are verified in Lenche Dima watershed as well as in the extension PAs. We neither can afford to shelf potential technologies nor to simply continue on working on generation of new technologies while the ones verified are not scaled-up. This is particularly true as the project is approaching its phasing out.

- The center should work towards publishing the results from the on-farm technology evaluation work in a form of user friendly popular publication format to encourage use of the technologies by the extension system. The AMAREW Project should support such endeavors.
- To resolve any outstanding issue with the WOARD the research center should take the initiative to promote two way communications. The discussion the RIT evaluation team had with the WOARD in the presence of the Woreda administration will probably resolve issues related to assigning DAs that primarily take care of activities under the AMAREW Project. For all these to come true, the research center should take the lead and initiate discussions with the WOARD as per the MoU signed between the two parties with AMAREW's initiative.

9. Day 5: Tehuledere Woreda
(August 8, 2006)

9.1 Explanation by the WOARD team inside its compounds

In Tehuledere AMAREW operates in three extension PAs including 05, 012, and 015. In these three PAs not only technology extension work but also natural resource restoration work is being done. Following the explanation the team conducted field visits in two places, at 05 and 012 PAs.

9.1.1 Highlighted Capacity Building Interventions

Long-term degree (3 BS and 1 MS) and several short-term in-service trainings have been offered to WOARD staff and selected farmers and community leaders. Selected community members received training on Artificial Insemination (AI), modern bee keeping (39 farmers), fisheries, hay-brooder poultry technology (35 farmers), horticultural production under irrigation with the pedal pump (36 farmers), feed production, and Integrated Pest Management (IPM). Box 3 gives specific activities of the IPM group.

9.1.2 Highlighted Extension Component Interventions

- Extension interventions in Tehuledere constitute three extension PAs and includes distribution of modern and transitory bee-hives (Fig. 16), fishing equipment, pedal pump, day-old chicken hay-brooder technology, and different improved crop cultivar seeds. In this regard 2 fish containers were made and given to two fisheries associations, 37 day-old chicken hay-brooders were distributed and one crush for AI service was constructed. Improved seed Distributed in 2005 and 2006 is given in Table 20.
- The intervention at HH level is made in a way that it improves farm-system synergy. For example, on Mohammed Ali's farm (Kebele 012) WOARD promoted dairy cow technology (dairy cow from non-AMAREW sources and training from AMAREW sources), modern and transitory bee-hives (training as well as materials from AMAREW sources), and day-old hay-brooder technology (training and material from AMAREW sources). Due to use of assortments of technology sources the farm was able to increase its income substantially (Table 21).
- The pedal pump technology helped to boost horticulture production in all the three PAs. The number of pedal pumps distributed in the different PAs and the benefits from using the pump in vegetable production is given in Box 4.
- Although our WOARD staff did not participate in the June 2006 FREG training due to WOARDs internal problems, due to the presence of Sirinka RC staff and selection of Kebele 015 (Godguadit) for the FREG field practical, two FREGs named 'Adis Limat' and 'Kokeb' were formed. The FREGs are active currently.

Fig.16. Modern beehive technologies, promoted by AMAREW Project in collaboration with Tehuledere WOARD, have enhanced honey production and thereby farm income

9.1.3 Highlighted Watershed Component Interventions

In Kebele 015 (Godguadit), a watershed known as 'Mariyam Deber Hayk' is selected for integrated watershed development. WOARD staff and community leaders from the watershed have made an experience sharing visit in Lenche Dima watershed. Work so far done on a 5 ha area of the watershed is given in Table 22.

Box 3: Visit of the Gobyie (Kebele 05) IPM Group

Explanation given by the IPM group chairman Seid Abate and the supporting DA Fenta Mulat

Sixteen selected PA members were trained in crop protection, mainly IPM concepts (biological pest control, identification of botanicals, mixture proportions, fermentation days, etc.), and agronomic concepts, mainly compost making.

The crop protection service the group provided so far is summarized below

Year	Type of intervention	Number of beneficiary HHs	Volume of pest control chemical (l)	Remark
2005	Tef aphids	199	653	
	Beans and peas diseases	20	80	
	Cattle diseases	10	5	
	Orange diseases	25	90	30 seedlings treated
	Flea control	30	150	
2006	Army worm control	965		101 Female headed
	Orange diseases	Nursery	unknown	1666 seedlings treated

Had it been expressed in monetary terms the services given would have cost the Woreda hundreds of thousands of Birr for chemical purchase. Beyond that the environmental advantage of the IPM technology entails more than any monetary value.

Table 20. Improved seed distributed in 2005 and 2006 in Tehuledere Woreda AMAREW Project extension intervention PAs

Crop / Cultivar	Quantity provided (kg)		Planted area (ha)		Beneficiary farmers			
	2005	2006	2005	2006	2005		2006	
		-		-	M	F	M	F
Maize (BH-540)	5,00	-	16.6	-	71	9	-	-
Wheat (HAR-1522)	1,000	-	6.7	-	22	5	-	-
Wheat (HAR-1685)	-	3,000	-	20	-	-	140	10
Dry beans (Awash Melka)	1,000	-	16.6	-	63	7	-	-
Pepper (Marko Fana)	25	50	25	50	8	4	450	50
Tef (DZ-01-196)	-	1,500	-	50	-	-	69	11

Table 21. Mohammed Ali's farm income due to use of different modern technologies, Kebele 012, Tehuledere Woreda

Type of technology							
Dairy cow			**Bee hives**			**Poultry**	
Cattle type	**Milk per day (l)**	**Total income (Birr)**	**Type of bee-hive**	**Honey (kg)**	**Income (Birr)**	**Progress**	**Number**
Mother cow	15	1,000*	Transitory (7)	17	850***	Originally received	39
1st-born heifer	9		Modern (4)	31		Exchanged with other farmers	200
2nd-born heifer	6		-	-	-	Sold	46
1st -born bull		1,700**	-	-	-	Layers kept on-farm	18

*Total of 9 months from the mother cow and its heifers
**From bull sales
*** From both modern and transitory bee-hives

Table 22. Physical work done in the Maryiam Deber, Hayk Watershed, in 2006

Type of work	**Size of work**	**Remark**
Half-moon percolation structures	2,500 (no)	Timber (Eucalyptus), and forage species (Sesbania, Pigeon peas) are planted on all structures
Hillside terrace	1 km	
Stone check dams	30 m^3	Farmers are to be trained for Gabion wire box on the spot production
Trenches	1,500 (no)	

Box 4. Vegetable Production in Gobeya (Kebele 012) using pedal pumps

During its visit of extension interventions at Gobeya, the team discussed with vegetable producers who benefited from the pedal pump technology. Using AMAREW Project extension budget the WOARD has purchased and distributed several pedal pumps to encourage off-season vegetable production (see Table below)

PA	Number of pedal pump beneficiary farms
05	7
012	6
015	7

Farmer Abdu Jemal's explanation of the benefits from his pedal pump

Farmer Abdu, resident of Kebele 012 was one of the beneficiaries of the pedal pump technology. Earlier the credit value for the pump was Birr 512, whereas to encourage as much users as possible to come up front, it is now lowered to Birr 350. Abdu, beyond using the pump to produce vegetables on his own farm has teamed up with other pump user Seid Endris and increased the delivery hose length for renting purposes. The technology then became an income sources not only to those owning it but to others too (see Table below):

Abdu & team mate		**Hose renter**		
			Income (Birr)	
Use type	**Income (Birr)**	**Use type**	**Before renting**	**After renting**
Cabbage production	700	Chat production	300	1200
Carrot production	840			
Beetroot production	550			
Delivery Hose rent	120			

Ato Abdu and Seid reported that the major problem they are encountering is not being able to get additional hoses to further extend the use of their pumps. Their effort to buy from markets remained in vain as hoses are not retailed in markets. They therefore requested for external assistance to get access to the material.

9.2 Day's Evaluation Wrap up Meeting at Hayik Woreda Administration, August 9, 2006

At the start of the meeting, an explanation on the team's mandate and interest was given by the Evaluation Team Chairman. The below stated series of questions were then posed by the evaluation team in the interest of widening its understanding, identifying strengths and limitations and set recommendations on the way forward.

Question: What is the extent of understanding and supervision provided by the Woreda administration team towards the AMAREW Project? Did the Woreda administration team know the extension interventions supported by AMAREW in the three PAs? Did the Woreda ever evaluate the Project in its own right?

Answer (Admin): In this Woreda we never evaluated individual Projects in their own right. Projects performance is evaluated altogether but not separately. The sector to which a project belongs is, however, expected to perform

separate evaluation of each Project that it is leading. Regarding the AMAREW Project such evaluation should be provided by the WOARD as it is the sector to which the Project belongs. The Woreda administration understands that the AMAREW Project is operating in Tehuledere Woreda, but this doesn't mean that we know in detail the Project's activities.

Question: Tehuledere Woreda is one of the Woredas of the ANRS with large presence of donor funded Projects. What are the elements that differentiate AMAREW from the other Projects present in the Woreda?

Answer (Admin): It is true that several Projects operate in Tehuledere Woreda. All but the AMAREW Project have their own field level implementation personnel. The AMAREW Project is implemented by personnel from its partner sector bureau, which is the WOARD. The Project allocates the resources, trainings and plays wider advisory and guidance role. Because the WOARD staff knows the situation better this decentralized implementation approach should be the best in terms of realizing plans and hitting Project targets. May be due to the persistent incompetent leadership that characterized the WOARD for quite a long time, performance might not have been as expected. We however still believe that the approach followed by AMAREW is the best. We also believe that the Project's approach itself contributes towards sustainability of Project achievements upon its completion?

Question: Did the WOARD generate sufficient readily available quantitative data that show Project performance, achievements, and changes in beneficiary farmers' livelihood systems?

Answer (WOARD): The poor leadership that the WOARD has maintained for long did not allow leading development activities in an organized and coherent manner. Due to this, at this point in time the WOARD may not provide data that show trends and changes.

Question: Were the AMAREW Project interventions successful in Tehuledere? Did the interventions bring any change in farmers' livelihood systems? How do you evaluate Project achievements?

Answer (WOARD): Yes the AMAREW Project is a successful project in Tehuledere Woreda in terms of its choice of technologies that bring rapid changes in rural economy. Examples in this regard are the pedal pump irrigation technology, the modern bee-keeping technologies, and the day-old hay brooder poultry technology. Targeting the appropriate farmers for these technologies gave good results that positively impacted on farmers livelihoods. There are certain technologies that could have brought more changes to the rural economy but were not yet addressed. One such technology is the dairy technology with cows that have raised exotic gene levels. Because such breeds were not available sufficiently, WOARD was not able to extend the technology aggressively. The improved seed technology was another technology with considerable positive impact although due to poor follow up and data recording WOARD was not able to show the changes due to them.

Question: With the current limited availability of improved seed from the formal seed sector the revolving seed scheme was believed to help farmers benefit from the technology equitably. What is the progress made towards ensuring the functionality of the revolving seed scheme that underpins the idea of introducing different improved crop cultivars?

Answer (WOARD): I know something has been tried in this regard. But due to the leadership failures data recording that may have enabled noting the trend may not be that impressive. With the assistance from the Project office, WOARD should consider conducting a post-ante study to get hold of the data.

Question: The AMAREW Project is left with only 1.5 years. What are your plans to ensure continuity of Project achievements upon completion of the Project? This has to be an issue of concern more than ever before because the Woreda is in a state of crisis whereby WOARD operated for long under extreme staff turnover conditions, changing and incompetent leadership, and grassroots extension activities are carried by DAs who never cease insisting on top up payments for executing activities that still fail under their ToR? In June 2006, the then WOARD head refused to send his staff to attend a FREG training offered in Dessie and even was not willing for the field exercise to be implemented in Kebele 015 (Godguadit).

Answer (Admin): It is true that there was a leadership failure from the WOARD. Although many of the experts, SMS and DAs received different trainings organized by the Project, they did not develop sense of Project ownership to accomplish more. Sometimes DAs and the WOARD leadership were not responsive to farmers' development needs. For example WOARD was not able to give leadership during the recent (June 2006) army worm occurrence. The Woreda administration had to takeover to speed up the control operation. During the control rush, we noted how AMAREW Project earlier capacity building support in the area of IPM was really essential. The IPM group, beyond supporting themselves, sprayed large quantity of bio-control chemical in larger number of farmers' fields. The WOARD head who just left office has demonstrated confidence crisis to the extent of not making any decision. FREG training was one of those things that were caught by the confidence crisis trap.

9.3 Recommendations on the way forward

- Good leadership is the key to success of any operation. In the past WOARD was not able to provide appropriate reports in due time. It had poor performance in budget utilization. For that matter, as we just heard it now, its recent leader did not even know the Project budget let alone leading its proper and timely utilization. The leadership failure had also negatively impacted on DAs performance and sincerity towards their job. It is a recent history that the WOARD head refused to send its staff for the FREG training held next door at Dessie, whereas other trainees came from as far as Sekota. All these show that there was serious leadership failure in the past. The Woreda administration team has to remove this problem without any further delay.
- WOARD's utilization of the AMAREW Project portion of its budget was poor in 2005 and burn rate of 2006 is also poor. WOARD should use the detailed 2006 plan of work to realize better budget performance, which means better implementation of planned activities. The Woreda administration team should follow the matter seriously.
- WOARD has to be able to generate quantitative data that show trends and changes due to the AMAREW Project interventions. It has to be able show from where to where farmers who received technological inputs supported by the AMAREW Project have reached. That is only when one could confidently speak about the achievements of the Project. The Project office should also give technical and advisory assistance in that regard.

- Regarding pedal pump user farmers request to buy additional hoses you may organize the farmers into groups and help them to buy the hoses at the wholesale or direct from the distributor.
- The WOARD can encourage improved seed exchange among farmers by seriously following on the revolving seed credit scheme. It can even work towards organizing on-farm seed production and marketing collective action groups, as an alternative approach to strengthen improved seed supply system at the local level.
- One major drawback noted was the weak coordination, and follow up of Projects and NGOs operating in Tehuledere. The Woreda administration team has to give the matter a serious thought and improve Project coordination and follow up without any further delay. You have to be able to provide better Project and NGO leadership if you want to see all Projects achieving their goal.

10. Day 7: Debre Berhan Research Center
(August 10, 2006)

10.1 Field visit at Ankober Woreda, Gorebela Kebele

The center manager and the AMAREW Project focal person explained that potato on-farm demonstration and cool season vegetable seed production endeavors of the center were largely supported by the AMAREW Project. The RIT evaluation team visited the center's seed production experimental plot at Gorebela.

10.1.1 Cool season vegetable seed production activities

At Gorebela kebele (3100 masl), the center is busy in trying to develop appropriate cool season vegetable seed production technologies (Fig. 17). Crops considered include spinach, beet root, carrot and cabbage. Results obtained are given in Table 23.

Under AMAREW sponsorship, selected farmers from Chefa, Baso and Gorebela have received hands on training on cool season vegetable seed production. Seed production FREGs have been established and Spinach seed production efforts under FREG's control is already underway. Cabbage seed production will start soon under FREG's management.

Table 23. Cool season vegetables seed yield at Gorebela experimental field, Ankober Woreda

Vegetable type	Seed yield (kg ha^{-1})	Remark
Spinach	1,600	Under on-farm seed production
Beet root	1,800	
Carrot	600	
Cabbage	600	Soon to be put under on-farm seed production condition

Fig. 17. Cool season vegetable seed production plot of Debre Berhan Research Center at Gorebela kebele, Ankober Woreda

10.1.2 Ware potato production

Pre-extension on-farm cultivar demonstration was supported by AMAREW Project. Two improved potato cultivars released by the center viz. Gera and Gorebela were demonstrated. Gera is a popular variety for potato stew, whereas Gorebela is a cultivar with industrial qualities. Due to its high starch content it is good for boiled potatoes and chips making. Due to such demonstration efforts, potato, a crop which was less known in Ankober Woreda earlier, is now grown by farmers in the areas where the demonstrations were carried out. Accordingly, 32 farmers in Gorebela Kebele produced potatoes in the 2006 Belg season in lieu of barley, which was the dominant crop in the area.

As the crop's importance is gaining momentum, a prototype ware potato store was built on the experimental field for farmers' observation. The store which is built of locally available materials can keep ware potatoes from 6-8 months with the appropriate store management. Moreover, a prototype DLS built from locally available materials has been constructed in the experimental field for demonstration purpose.

The next step should be linking producers with potato traders for the crop culture to bear incentives to farmers. The availability of markets will enhance the diffusion rate of the potato crop in Ankober and similar Woredas.

10.1.3 Visit of the Chefa FREG at Ankober Woreda

A FREG organized around cool season vegetable seed production was visited (Fig. 18). Three FREG members have already planted spinach for seed production purpose. The FREG was established through a joint effort of Debre Berhan RC and Ankober WOARD. A DA is supervising the seed production plots and advising farmers on seed field management.

Fig. 18. The RIT evaluation team discussion with Chefa FREG members in Ankober at their cool season vegetable seed production plots

One envisaged problem that may limit the development of vegetable culture including potatoes is the underdeveloped market situation, stressed the FREG members.

10.2 Round table discussion at the center

Upon returning from the field visit a discussion session was opened with the center's research staff (Fig. 19). One major question was forwarded by the evaluation team:

Question: What are the achievements to date in terms of technology demonstration and diffusion, capacity building and research-extension-farmer linkage?

Answer: The AMAREW Project focal person indicated that in terms of technology demonstration and diffusion AMAREW has so far supported 49 research activities the majority of which fall under the on-farm technology

demonstrations and evaluations category. Out of the total research activities supported by AMAREW 36 are completed, whereas the remaining 13 are on-going. The titles of the completed as well as the on-going projects and achievements in terms of yield are given below:

Fig. 19. Discussion session between the RIT evaluation team and Debere Berhan Research Center staff

10.2.1 Completed research activities

1. Characterization and Analysis of Farming System of Gera Keya in North Shewa
2. Characterization and Analysis of Farming System of *Efratana Gidm Wereda* in North Shewa
3. Evaluation of different mating /lambing seasons on lamb growth, survivability and ewe productivity
4. Developing and testing of control of ovine nematodes and trematodes in North Shewa
5. Integrated approach for the control of Russian wheat aphid (RWA) on barley at Gera Keya Woreda (Dargeghn).
6. Training delivery for subject matter specialists of zonal Department of Agriculture North Shoa Zone in the ANRS
7. On farm supplementation of grazing sheep during the dry season

8. Identification and evaluation of the nutritive value of some indigenous feed supplements at Gumer and Dargegne
9. Bread Wheat Variety Adaptation Trial
10. Food Barley Variety Adaptation Trial
11. Survey on the Potential Uses and Limitations of Multipurpose Trees and Shrubs in GeraKeya Woreda
12. Potato variety adaptation trial (Two trials)
13. Integrated survey and identification of currently extended wheat root problems occurred in GeraKeya Woreda, North Shewa
14. On-Farm NP Fertilizer Trial for Main Season Barley Production on Different Soil Type at Gera Keya Woreda, North Shewa
15. Evaluation of different water harvesting techniques in improving the survival rate of tree seedlings in drought affected Woredas. GeraKeya and Shewa Robit Woredas
16. On farm NP fertilizer trail for main season barley production on different soil types in Gerakeya Woreda, North Shewa. GeraKeya
17. Agro-meteorological and cropping pattern analysis in the northeastern part of Amhara region. selected werdas of north Shewa
18. Evaluation of planning, implementation, monitoring and evaluation systems of the past and current Soil and Water Conservation activities in Amhara region. Six selected locations in the zone.
19. Early Maturing Sorghum variety Adaptation Trial in Merahebete, Efratanagidim and Antisokia Gemeza
20. Tef Variety Adaptation Trial, Ephratana Gidim
21. Triticale Variety Adaptation trial, Gera Keya
22. Bread wheat variety Adaptation Trial, Gera-keya woreda
23. Food barely Variety Adaptation trial, Gera-keya woreda
24. Potato variety adaptation trail, Ephratana gidim wereda
25. Evaluation of Strategic Deworming Programs on Village Sheep in GeraKeya, Gerakeya woreda
26. Study on diseases of chicken and developing control options in the backyard production system of Eastern Amhara, Eastern Amahra (North Shoa, Oromia and South Wollo)
27. Diagnostic farming system survey of Angolelanatera-Asagirt weredas, Angolelanatera and Asagirt weredas
28. Evaluation of Multipurpose Trees and Perennial Grasses for Gully Rehabilitation and Biomass Production in the Lowlands of North Shoa Shewa Robit or Efratana Gidim Woreda
29. Investigating effects of potassium nutrition on yields and frost resistance of selected crops. Mehal Meda
30. Testing low-cost drip irrigation technology suitable to the current water harvesting practice, Ankober
31. Farmer participatory initiative for awareness building on improved pest management among smallholder farmers in north shewa.
32. Community based foot -rot control strategy under traditional sheep production system in Angolelana-Tera wereda, North Shoa

33. On-farm demonstration of improved potato varieties with their production packages, Efratana Gidim
34. On-farm demonstration of improved food barley variety with its production package, Gera Keya
35. On farm demonstration of wheat variety with its production package. Gera Keya, Lalo Mama,
36. On farm demonstration of faba bean varieties with their production package. *Gera Keya, Lalo mama*

10.2.2 On-going research activities

37. Pre-Extension Demonstration of improved Barley varieties for *Belg* season in the highlands of North Shewa
38. On farm evaluation of the effect of nitrogen fertilizer levels on bread-making quality of bread wheat varieties under vertisol condition. Ensarona wayu
39. On-farm evaluation of multi-purpose trees and shrubs for sustaining productivity in alley cropping
40. On-farm evaluation of introduced malting barley varieties. Ankober
41. Seed multiplication at Ankober and Ensarona wayu
42. Spatial Rill Initiation and Network Assessment Over Hill slopes Under Tillage and without Tillage conditions in the Highlands of North-Shewa, Ethiopia (SGMP)
43. Determining the optimal enterprise mix in crop-livestock integration for sustainable farming systems in the highlands of North Shewa, Amhara region (SGMP)
44. Enhancing the transfer of improved crop (wheat, faba bean, lentil, chickpea) production technologies using FREGs.
45. Training of farmers and Woreda SMSs
46. Potato seeds and DLS popularization
47. Participatory Cool Season Vegetable Seed Production and linking with market opportunities in cool highlands of North Shewa: The Case of Ankober Woreda
48. Evaluating Adaptability of Introduced Trees and Shrubs for Multipurpose and Best Option Product in Different Agro Ecology of North Shewa Zone.
49. Faba bean (*Vicia faba L.)* Pure seed production Scheme to increase production and productivity and rural income in vertisol and high altitude areas of North Shewa,

Summary of the mean yields obtained from the different research activities supported by the AMAREW Project and managed by the Debre Berhan Agricultural Research Center at different on-farm sites is given in Table 24. Details on specifc crop technologies demonstrated could be found in Annex 2.

Table 24. Mean yield of the different crop technologies evaluated under on-farm condition due to AMAREW's financial and advisory support

Crop type	Name of the cultivar	Mean yield (t ha^{-1})
Teff	DZ-01-1285	*1.6*
	Local	*1.5*
Sorghum	Brehan	*2.6*
	Teshale	*1.9*
	Meko	*2.2*
	Abshir	*1.7*
	Gubiye	*2.1*
	Local	*1.9*
Wheat	HAR 1868	*2.8*
	HAR 1899	*2.7*
	Local (Shemet)	*1.9*
Barley	HB 42	*4.0*
	Abay	*4.1*
	Shege	*4.3*
	Miserach	*3.7*
	Local	*3.5*
Faba bean	Lalo	*2.3*
	Dagm	*2.1*
	Local	*1.6*
Potato	Gorebella	*30.5*
	Gera	*27.9*

10.2.3 Capacity Building

The center has benefited largely from long-term degree training component of the project. So far 2 MS and 1 BS studies have been supported by the Project. In addition, the center and the surrounding farmers have benefited from various short-term training and overseas and in-country experience sharing tours:

- Inductive training for the novice research worker,
- Training on FREGs,
- Training on cool season vegetable seed production and marketing,
- Training on statistical software (SAS and SPSS) and
- Experience sharing tours to India, Kenya were among the cited ones.

10.2.4 Research-Extension-Farmer linkages

- AMAREW has played a proactive role towards the development of research-extension-farmer linkage. This was demonstrated by the encouragements made to focus on on-farm research. As demonstrated above the center was able to demonstrate several technologies on-farm and to engage in the diffusion of some of them. Such on-farm research efforts encouraged the move towards farmer participatory technology validations. Beyond that the center, in collaboration with Ensarona Wayu and Ankober WOARD offices, was able to establish at least four FREGs in four sites. This shows that a move is being made towards the right direction that encourages research-extension-linkages to develop.

- In terms of development of functional linkages we may say that the move is very slow. AMAREW has facilitated on-farm implementation workshop in March 2006. It was a very good discussion forum, although field level achievements did not show what has been said at the meeting has materialized. Because linkage systems are not yet institutionalized, any attempt made so far revolved around individuals initiatives and motivations. The development of a functional linkage that AMAREW is attempting to promote at the Woreda level in the absence of any abiding policy statements or guidelines may not take us that far.

10.3 Recommendation on the way forward

- The effort towards introducing new vegetable crops and assisting farmers to engage in on-farm seed production is one way to encourage the development of horticultural economies. But the Woreda development workers (WOARD and Debre Berhan RC) should move way beyond that to address marketing and home economics issues. A visionary intervention to link vegetable producers with the available market has to be launched. Moreover, to encourage vegetable use at the farm level, home science training has to be organized for farmers.
- Much has been done and achieved in terms of on-farm demonstration and validation of improved technologies. A concerted effort should be made to compile data and produce a popular publication in a way that allows technology scaling-up.
- All (ARARI, BoARD, AMAREW) should join their efforts towards convincing policy makers to support the linkage institutionalization efforts.

11. Evaluation Wrap up Meeting in Addis Ababa USAID Conference Room (August 11, 2006)

The evaluation team agreed the report structure to follow Component Review Approach addressing the Research, Extension, Watershed, Capacity Building, Micro-Enterprise Development components of the Project as well as dealing with cross-cutting issues. It was agreed to identify strengths, limitations of each component and to suggest strategies and approaches on the way forward and finalize by forwarding recommendations that improve achievements further. To substantiate the evaluation findings and generate a complete report, the use of secondary data for sites visited as well as not visited including ARARI headquarters, Adet and Gondar ARC, and East Belessa WOARD was recommended. Moreover, data that show project impact should as far as possible be obtained from the field notes and project implementers for the completeness of the evaluation report.

11.1 The Watershed Component (See Annex 3 for details)

Strengths	Limitations	The Way Forward
Convincing the communities to accept the watershed approach has been done well and is exemplary	Repeated failures in utilizing allocated budget limited the introduction and further development of economic activities that would have benefited the community more	Community empowerment has to be further strengthened to ensure sustainability of project achievements after project ends
Community watershed management organizations establishment and community empowerment done well	Some introduced technologies may not be appropriate or were inappropriately delivered. The poultry technology in *Lenche Dima* should, for example, be preceded with the appropriate training or awareness creation	Food utilization and nutrition work should be strengthened
Size of intervention in terms of physical and biological conservation work has shown progress through time	Documentation of activities, and achievements in terms of data that show impact was not done well	Project has to provide quantitative data in all documentations
Integration of components towards production system diversification (inclusion of fruits and vegetables), necessary for the system's synergy and resilience is particularly satisfactory in Lenche Dima	No close monitoring and evaluation scheme that involves project partners was put in place	Include and promote more income generating activities
The development of potable water points and the dome water harvesting structures that made the production of fruits and vegetables possible answers farmers' interest in seeing the economic advantages of watershed management	Water lifting and delivery mechanisms are not sufficiently used	Pay more attention to the use and introduction of water lifting and delivery technologies such as the rope and washer pump
Promoting off-farm income generating activities such as fuel efficient stoves and gabion boxes production demonstrate the move towards the right direction of Micro-Enterprise Development although still more needs to be done	The MED component of AMAREW has been phased out	Current AMAREW components to incorporate MED activities as much as possible
About 44 landless young farmers enabled to own rehabilitated and improved land in the Lenche Dima closed area enabled them to support their livelihoods	Whereas support from WOARD was weak that from the Regional BoARD was almost inexistent. For example they failed from assigning DAs to watersheds as agreed in the Project document	

The presence of watershed-research-extension activities in both Yeku and Lenche Dima pilot watersheds is encouraging compared to the insufficient integration of R-E in the extension pilot sites although much still remains to be desired	Research component participation in the watersheds was weak until recently. There was no satisfactory R-E joint planning until 2006. Observing what has been achieved this year due to the joint planning, it is reasonable to conclude that more would have been achieved had more satisfactory joint planning been practiced earlier too	
Initiated pilot watershed activities in one Kebele per Woreda in East Belessa, Lay Gayint and Tehuledere using lessons learnt from Yeku and Lenche Dima watersheds	Several signs that Research-Extension linkage was weak. Linkage strength indicators such as establishment of FREGs in watershed sites, advise from research to enhance survival rate of planted tree seedlings (when to plant, how to plant, where to plant, what to plant), etc. was not observed	
Developed, in collaboration with other stakeholders, a Community-Based Participatory Watershed Development Guideline to guide national level efforts	Integration of economically viable crop and livestock activities is insufficient at *Yeku* watershed compared to *Lenche Dima*	
Watershed development work at Lenche Dima was considered exemplary and the site was recognized as one of the sites in North Wollo Zone where the 2004 World Environment Day (January 5, 2004) was observed	Frequent AMAREW focal persons changes in pilot WOARD offices has been disruptive to watershed management related project activities and continuity of work	

11.2 The Extension Component

Strengths	Limitations	The Way Forward
	The region did not have a defined extension system to properly lead extension undertakings. Due to this, technology promotion attempts made so far did not pass through a proper Monitoring and Evaluation system	Focus on scaling-up of technologies with proven performance by only focusing on few selected technologies
The design of the project with full ownership of the WOARD has promoted sense of ownership even under less ideal conditions that the WOARD are operating. Conditions that allow testing of the original hypothesis that decentralized project implementation will add to project success has however not been reached yet	Efforts made to promote joint implementation of planned research extension activities was poor and was not done in a way that it brings enhanced changes in R-E planning and implementation process	Improve revolving technology and credit (e.g. seed, goats etc)
Effort to make joint research-extension planning since the start of the project was good	Technology dissemination and multiplication at target extension sites not done in a way that promotes farm system's synergy and thereby positive impact	What is the extension system followed by the WOARD?
The FREGs established in different extension sites have positive contribution to linkage	Commitment to the project and participation of the WOARD extension experts in project activities is unsatisfactory	Organization of the extension system needs improvement
Technology based training of farmers has positive impact. Specific examples are FFS-IPM, Apiculture, Treadle pump, and the like	Project ownership and commitment by WOARDs still unsatisfactory. The WOARD, for that matter failed from assigning DAs into the extension PAs for the last three years and that imposed serious hindrance in project implementation. The team also noted internal problems at several Woredas (absent WOARD head, DAs leaving workplace, etc.) that negatively impacted, among others, on what could have been achieved by the project	WOARD and BoARD to resolve these limitations
Promotion of improved farm technologies in addition to crop varieties was commendable. Mention be made of the fuel efficient stove, the rope and washer pump, the treadle pump, etc.	Frequent AMAREW focal persons changes in pilot WOARD has been disruptive to extension related project activities and continuity of work	
Attempts made to promote the use of improved crop varieties such as faba bean,	Technology dissemination dealing with too many crops and commodities, spread out too thin, diffused activities	Narrow down the number of technologies to a few with projected good impact

chick pea, wheat, barley, tef, sorghum, etc is commendable but lacked focus	and resulted in insufficient focus	
Though late, the recent measure (since early 2006) taken by WOARD to assign DAs in extension PAs is encouraging	Technology multiplication and scaling-up to reach more farmers was poor, data based documentation was almost inexistent	
Attempts to expand promising farm technologies to new watersheds based on observation from earlier watersheds is a practice to be encouraged	Ownership of extension activities by WOARD unsatisfactory. This also relates to the frequent changes in representation of the BoARD at the level of the RIT as well as no attention given to the project by the regional BoARD proper	WOARD and BoARD to rectify these issues
Furthering technology use through a revolving credit scheme has enabled the project to reach more users as observed with the goat stocking in the watersheds	Very poor budget utilization by WOARDs limited project achievements.	Budget utilization by WOARDs needs drastic improvement
	Frequent leadership changes in WOARD had negative impact on project implementation and continuity due to poor leadership	WORDs are expected to stabilize the leadership instability
	The administrative restructuring such as dismantling the Zonal BoARD offices and the introduction of the single pool finance system had all negative consequences on project achievements	
	Search so far made to identify relevant technologies that improve success rate was limited. Further technological search at national or even international levels could probably have improved success rates in watershed rehabilitation by tree planting	

11.3 The Research Component

Strengths	Limitations	The Way Forward
More attention to conducting on-farm research as a prerequisite to enhance farmers' participation, generation of appropriate technologies and ease of diffusion	No commensurate agro-ecology based scaling-up job has been done in terms of furthering technologies tested and verified on-farm. Did we incline towards considering the Project as one other additional source of fund for our proposals?	Revisit relevance of on-farm research projects, as some do not seem relevant in meeting farmers' needs. This is best achieved by promoting joint annual R-E planning of annual
Various technical advices to researchers from senior project staff	Research involvement in the extension Woredas is far below the expected level. There was only limited attempt to further technologies tested and verified through Project support by linking with extension	Focus should be made on conducting adoption study, probably by going to the extent of hiring a short-term consultant in case expertise is lacking
Human capacity building through various training such as inductive training for young researchers to properly integrate into the research system	Documentation of technologies developed, tested and verified is poor. Was on-farm technology testing considered an end by itself?	Fine tune technologies and focus and prioritize selected commodities with immediate potential impacts to scale-up
Physical capacity building to strengthen the research influence on production. Cases cited are Tissue Culture Laboratory and other facilities	No attempt was made to organize information on farmers' technology use for the innumerable technologies disseminated	Scale down activities and focus more on scaling-up
Linkages established with some American Universities through Small Grant Mentorship Program contribute to capacity building of ARARI researchers in terms of generating relevant data and using proper data analysis	The failures in R-E linkage did not allow focusing on those technologies that respond to farmers' needs. Case in point is lack of technologies to control Wollo Bush Cricket problem in *Sekota*	
Project promoted country wide technology search, verification followed by dissemination en lieu of focusing on technology development only	No meaningful attempt has been made to conduct socioeconomic studies and delineate acceptance and contribution of technologies in beneficiaries livelihood systems	
Certain technologies verified in Project implementation sites have reached non-project sites		

11.4 Promoting Research-Extension-Farmer Linkage

Strengths	Limitations	The Way Forward
Establishing Research and Extension Technical Committee and signing of MoU at Woreda level between R-E with planned WOARD leadership is good practice	Lack of a well defined system of linkage has entailed obvious problem, what is expected of the linkage could not be defined clearly	Review lessons learned on strengths and weaknesses of R-E linkage approaches promoted by AMAREW Project for scaling-up success
The ongoing effort of formation of FREGs is a plus and should contribute to strengthen linkage	Leadership in the system has almost fallen apart due to staff caused problems prevalent in some of the Woredas visited	Develop a workable system that ensures linkage between Research, Extension, and Farmers. Advise the DG of ARARI and the head of the regional BoARD to take the lead. Following the research-extension strategy of the region, an action document that specifies memberships, meeting dates, activity plan, budget, etc. should be developed. The AMAREW Project should play a leading role in developing the document
The move towards a joint R-E planning is a good start although the timing was not as such appropriate in terms of ARARI's research review and extension planning schedules	We are not learning enough from successful past experiences such as the bread and durum wheat production link made with the industry attained in West Gojam	Involve and work with appropriate NGOs and development organizations such as SIDA, CIDA, GTZ and others whenever they are present in a location in view of preparing the ground for later technology scaling-up
	WOARD focus on input delivery at the expense of its advisory role on technology generation and use nurtured reluctance towards appreciating the relevance of R-E linkages	Organizations at the regional BoARD and WOARD levels that enhance linkage should be studied, defined and improved
	In view of AMAREW Project's core objective of 'bringing a paradigm shift' in Research-Extension system thinking not enough has been achieved yet. Agreed upon time table for joint R-E planning should have appeared as part of the R-E value system by now	For the already started joint R-E planning to deliver a time table that takes care of the planning schedules of both research and extension should be agreed upon and followed
	Absence of institutional set-up that monitors performance of linkages, project activities, and thereby achievements are hampered	FREGs should be organized to promote benefits cascading from first to second, third, etc. level beneficiaries
		Serious thought be given to improving utilization of project allocated budget

11.5 Land Administration

Strengths	Limitations	The Way Forward
Related to land tenure issuance of certificates and demarcation of permanent plot boundaries in both Lenche Dima and Yeku pilot watersheds is a positive achievement. It should be noted that it is only the Department of Land Administration and Registration of EPLAUA that the AMAREW's activities refer to	AMAREW was not designed to give high priority to activities that relate to EPLAUA. This can be seen from the absence of Project employed advisor for land administration and absence of woreda level land administration staff participation in the annual Project planning workshops.	As far as the Project follows and promotes mountain rehabilitation and development strategy, the development path that we follow in any watershed (Yeku, Lenche Dima and others) has to be similar
Degraded hill side rehabilitation and distribution to young landless farmers is a good lesson	EPLAUA involvement in AMAREW's activity planning workshops and submitting quarterly as well as annual reports has always been poor	Land administration and the Project have to verify the contribution of land certificate issuance in Yeku and Lenche Dima in changing target community livelihoods, study its overall implications and delineate lessons that could be learnt. Some concrete examples have to be given in this regard
EPLAUA's planned focus for AMAREW has always been the two watersheds, Yeku and Lenche Dima	EPLAUA was consistently poor in its allocated budget utilization. For example in the current year EPLAUA didn't use its budget until the end of the 2nd quarter	The Project has to invite and motivate both regional and grassroots level land administration staff to fully participate and give support to the land administration planning related Project activities.
	The Project pilot Woredas are deficient in qualified land administration staff. Moreover, the Woreda land administration unit receives less or no support from the regional land administration department. In general there is no functional linkage between the Regional-Zonal and Woreda land administration departments	The land administration department should hence forth closely follow that land administration practices in the pioneering watersheds at Yeku and Lenche Dima as well as the newly considered watersheds. In the same say, Project has to give more recognition to EPLAUA and consult its staff on matters pertinent to land administration
	EPLAUA's participation in land administration related Project activities was so far marginal and it has totally failed from claiming Project ownership	

11.6 Capacity Building

Strengths	Limitations	The Way Forward
Though was being implemented as per the original plan has to endure major blow due to the restructuring of the AMAREW Project	The massive budget cut from the capacity building component of the project has negatively impacted project achievements in terms of both human and physical capacity building. Some short-term TA assignments from the USA were not implemented as planned	Future focus of the capacity building component of the Project should be on how to scale-up success areas and move forward
Contributed much to hold the mobile WOARD staff on duty at least until they complete their higher degree studies	Phasing out of the MED Project component has negatively impacted Project performance and achievements	The contribution of the capacity building has to be assessed against the original project objectives
Experience sharing tours made in-country and to overseas to note development initiatives in countries like India and Kenya has contributed to introduction of technological ideas and some selected technologies	Trainings originally planned to inject specific skills such as on GIS, soil water management, soil fertility management and technology dissemination approaches has not been realized	Training should be planned in a way that brings measurable full impact. It should hence embrace marketing, home economics and similar issues
Long-term degree trainings (10 MS and 23 BS) and short-term focused training on various topics done well by enlarge and are supposed to contribute to regional development efforts	Due to occurrence of circumstances beyond the control of the Project training planned for 2005 were not fully realized	Project should work with partners to delineate strategic elements that require TA assignments to assist the regional development efforts
Inductive training that induced the novice research worker to swiftly integrate into the research system and engage with little difficulties in research and extension work has been done successfully and its work that ensures its continuity is underway		
COLTA training that induces community leaders to engage into community development actions has been done successfully and is planned to be done in a manner that ensures continuity to reach different communities		
Long term MS degree training enabled a number of MS thesis research to be done on ANRS specific developmental problems		

Logistical support given to partner institutions in terms of vehicles, laboratory equipment and the like has facilitated sector offices performance		
Some TA assignments from the USA has been facilitated based on partners request though not originally planned		
FtF assignments on topics that require professional assistance has also been proposed and implemented to assist the regional development efforts		

11.7 Project Monitoring and Evaluation

Strengths	Limitations	The Way Forward
A lot has been done by the Project though it is not done in a way that allows tracking of results	The AMAREW Project has not established a clear M & E system from the start. Not emphasizing M & E during the formulation of the Project is partially responsible for this situation	Because any USAID funded project has to comply with the M & E schedule of the donor, AMAREW has to have a performance M & E plan. Because such a schedule requires a baseline data against which changes will be evaluated, AMAREW has to assemble baseline data from relevant secondary sources or retrospective studies. For example, baseline data could be obtained from the regional BoARD survey of 56 Woredas
There is data on inputs delivered and outputs obtained	Indicators have not been clearly specified. The Project has not generated baseline data from its watershed and extension intervention sites, nor has collected sufficient data that allow assessment of project achievements	Concerted effort be made to capture higher level impact, even if it is described in qualitative terms
	AMAREW did not develop data sheet that enables collection of data that show changes made due to Project intervention	Project should focus on developing format for data recording under its different components without further delay
	Absence of M & E person in AMAREW hampered proper implementation of M & E schedules that would have assisted to fine-tune planned work	Project should develop performance indicators based on Project objectives including indicators for impacts at HH level. We suggest AMAREW to consider three indicators, one for each of its watershed, research and extension components. Each of the indicators may be defined in both quantitative and qualitative terms
		As follow-up for M & E is essential and cannot be left aside, AMAREW shall employ an M & E personnel that leads the effort. The M & E personnel should motivate and follow with DAs to compile relevant data
		RIT evaluation and monitoring as part of its regular meeting schedule should be an important aspect of M& E
		Although the project has accomplished much and is able to show to the internal evaluation team several good work in the field, many of them lack data to substantiate achievement. This should be considered major gap and project has to work hard to fill the gap in the remaining project life time

11.8 The Way Forward: Issues of attention

11.8.1 Sustainability of Overall Project Achievements

Whatever has been achieved due to Project and the resources accrued have to be the property of the community. Measures to be taken by the Regional and Woreda sector offices to ensure sustainability of changes made in pilot intervention areas and their further scaling-up should be singled out and agreed upon prior to termination of the Project.

11.8.2 Realization of Project Objectives

The progress made in terms of achieving Project purpose has to be assessed and noted well. In doing that elements that limited full realization of project purpose yet such as the effect of project restructuring and budget cuts or other issues should be highlighted.

11.8.3 Cross-Cutting Issues

What the Project has done to address cross-cutting issues such as gender, HIV/AIDS and the like has also to be specified. Work done in this regard such as organizing women in pilot sites to engage in economic activities such as fuel saving stove manufacturing and marketing should be highlighted.

11.8.4 Monitoring and Evaluation

Since all USAID funded projects have to comply with the Monitoring and Evaluation (M&E) requirements of the donor, AMAREW has to sharpen its performance M & E plan. Because such a plan requires baseline data against which changes can be evaluated, AMAREW needs to assemble baseline data from relevant secondary sources or retrospective studies. For example, baseline data could be obtained from the regional BoARD survey of 56 woredas.

11.8.5 Overall Project Issues

- The current development policy of Ethiopia considers Woredas as the center piece of development undertaking. What the evaluation team has observed in some of the Woredas visited did not show a condition that leads to the realization of the policy thrust. Some of the pilot Woredas visited are experiencing leadership crisis and the development process risk to disintegrate due to human factor. It is the understanding of the team that this may seriously impede the development endeavors from hitting their targets. It therefore suggested that policy level attention be given to rectify the situation,
- Because the joint research-extension planning so far practiced did not encourage practical linkage to come by, in the remaining lifetime of the project the Project and its partners have to do their level best to promote timely joint Research-Extension-Farmer planning schedules. Beyond this the regional government has

to be advised to provide Research-Extension-Farmers linkage frameworks and modalities. The framework has to direct concerned development institutions such as the regional research institute and the regional agriculture and rural development bureau towards making linkages part of their value system. This in turn should lead towards institutionalization of R-E-F linkages.

- Because all the WOARD at the project pilot Woredas are characterized by underutilization of the budget allocated to them and this simply means loosing part of the budget to the donor, the team showed concern that serious thought be given to improving the budget utilization by the respective pilot Woredas. Financial utilization reporting is the other drawback that characterizes almost all partners of the AMAREW Project which should immensely be improved.
- Because there are several research results be it from activities supported or not supported by the AMAREW Project that may bring economic benefits to the farming communities in the pilot project Woredas in particular and the region at large, in the remaining project lifetime WOARDs and the respective research centers serving the respective AMAREW Project pilot Woredas have to immediately engage in technology scaling-up and scaling-out endeavors rather than on merely development of technologies.
- In the interest of ensuring sustainability of project achievements in the pilot watersheds and extension sites, the AMAREW Project has to develop the project's phasing out strategy from its pilot sites. A document outlining the process to be followed to ensure sustainability of project achievements has to be developed with full community participation and agreed upon by project stakeholders before the project closes down. This is particularly important to ensure the continuation of closed areas that are major components of the improved watershed management scheme.

ANNEXES

Annex 1

Revised Scope of Work (SOW) for the Internal Evaluation of the AMAREW Project by the RIT

1. Background

The Amhara Micro-enterprise development, Agricultural Research, Extension and Watershed management (AMAREW) Project is a USAID/Ethiopia Mission funded initiative established in July 2002 to provide technical assistance in integrated agricultural development in the Amhara National Regional State (ANRS). The Project works to strengthen agricultural research, extension, watershed management, capacity building, and micro-enterprise development in the ANRS by working with its ANRS partners in strategically selected three pilot watershed sites and eight pilot food-insecure woredas. The Project is being implemented by a Virginia Tech led Consortium (Virginia Tech, Cornell University, Virginia State University and ACDI/VOCA) in collaboration with its ANRS Primary Partners consisting of the Food Security Coordination and Disaster Prevention Office (FSCDPO), Amhara Regional Agricultural Research Institute (ARARI), Bureau of Agriculture and Rural Development (BoARD), Environment Protection, Land Administration, and Utilization Authority (EPLAUA), Amhara Micro and Small Industries Development Bureau (AMSEIDB), and Amhara Credit and Saving Institution (ACSI). FSCDPO has the overall role of coordinating Project activities; ARARI is responsible for the planning and implementation of research; BoARD plans and implements agricultural extension and watershed management activities in the pilot extension woredas and watersheds; EPLAUA has the responsibility for guiding land use and certification in the pilot watersheds; AMSEIDB and ACSI shared responsibilities for micro-enterprise and micro-finance issues in the target areas of the project, until the beginning of 2005 when the Project was restructured. The technical advisors of AMAREW, one for each component mentioned above, work with and advise their respective line department experts in all stages of project activities.

The main project-wide problem since the beginning has been the continuing and extended uncertainty about the future and sustainability of the Project, which had impacted staff morale. This issue has been looming over the horizon since the beginning of the second year of the Project when the budget was drastically cut and subsequently the redesign issue surfaced. Both the Project management and the RIT interacted with the Mission intensively, and repeatedly, to find ways to stabilize the situation. Subsequent discussions between the RIT and USAID/Ethiopia did indeed stabilize the situation in that later in the year the focus was project restructuring in lieu of phase-out.

Since the beginning of 2004, the Mission has launched a new Integrated Strategic Plan (ISP), which has entailed the reassessment of its on-going projects to ensure that they fall in line with the new ISP. Consequently, the AMAREW Project has been targeted for restructuring following the elements of restructuring given both to the Contractor by the

USAID Contracting Officer and to the Regional Implementation Team (RIT) by the Mission Director, hence the need for the restructuring.

Major Components of the Restructured AMAREW

Research: Supports applied food, agriculture, environment, and related natural resources management research at the regional level and below. The active participation of farmers and rural communities in identifying problems, demonstrating and evaluating alternative technologies, and on-farm trials as adaptive research approaches to test possible solutions is implemented to support and facilitate technology adoption.

Extension: The extension component responds to the needs and demands of the farmers in the project woredas, with an emphasis on participatory methodologies and active involvement of communities in the planning and implementation of development activities.

Watershed Management: The component facilitates the testing of the practical effectiveness and sustainability of a community based watershed management approach for environmental rehabilitation and ultimately attaining food security at watershed level.

Capacity Building: This component supports training, long and short-term, for ANRS personnel and farmers in essential disciplines related to adaptive agricultural research, extension, and natural resources management.

Micro-enterprise Development (MED) Component: The MED component was one of the main components in the original plan until the restructuring of AMAREW beginning 2005. MED related activities are addressed as part of extension and watershed management components, such as improved fuel efficient stoves, improved honey production and marketing, seed production of improved crop varieties, improved fish production and marketing, horticultural crops production and marketing, etc.

Pilot target woredas and major activity components for the restructured AMAREW Project

Target Area	Research	Extension	Watershed	Safety Net Program
Wag Hamra Zone				
Sekota Woreda	X	X	X	X
North Wollo Zone				
Gubalafto Woreda	X	X	X	X
South Wollo Zone				
Tehuledere Woreda	X	X	X	
South Gonder Zone				
Lay Gaynt Woreda	X	X	X	
North Gonder Zone				
East Belessa Woreda	X	X	X	
North Showa Zone				
Ankober	X	X		
Ensarona Wayu	X	X		
West Gojam Zone				
Sekela	X	X	X	

2. Purpose of Evaluation

The purposes of the participatory internal evaluations:

- Assess the monitoring and evaluation systems' limitations of getting credible evidence of achievements and results and interpretation of information to better inform decision makers about outcomes/ results.
- Review how well the project is contributing to the USAID strategic overall objectives as stated in the PMP.
- Learn on the key lessons of the project activities that could be scaled up
- Check how efficiently has the project management been able to solve the reported/observed implementation problems of the project based on RIT's recommended solution and review further the factors (internal and external) that are negatively or positively affecting the implementation and impact of the project and come up with potential recommendations
- Assess the major challenges of the project implementation that should be solved within the project life time and contribute for phasing out strategy development.

The results of this evaluation should be useful primarily to the Contractor and its consortium members and ANRS partners to make the necessary adjustments for follow up actions and decisions.

3. Evaluation Questions:

The following questions are given as starters and guide for initiating discussions in the field visits. They are listed in an approximate order of the visit schedule. Evaluators can add more questions in the field as appropriate.

- How effective is the project in improving the limited adoption and extension of technologies through addressing the scarcity of improved technologies appropriate for food insecure areas and needs of the entire household, including effectiveness of addressing gender concerns
- How many technologies (crop, livestock, natural resources etc) have been generated by the research system and transferred to the extension system?
- How many of the generated technologies have been transferred and adopted by farmers and contributed for income increase at house hold level?
- What are the impacts of the AMAREW-led activities (research, extension, watershed management, capacity building, MED, and land administration) on the food security and income of the community members, particularly women, at the watersheds and other food insecure woredas? (base on performance project/SO indicators – indicators in the proposal/contract, revised project impact indicators)
- What approaches/strategies did the project employ to bring the changes anticipated in the paradigm shift in existing research extension and farmer linkage system
- To what extent the project activities are integrated with the regional and woreda development plans?
- How has AMAREW done in terms of laying ground for sustainability of project activities, change in policies and institutional environment
- What are the major challenges of the project and implication on the achievements of the planned activities and attaining of project objectives?
- To what extent the capacity building activity help manage similar projects and programs?
- What is the status of the project activities in the new woredas and watershed?

4. Methods and Procedures for Evaluation:

Different participatory assessment methods will be used for the internal evaluation. 1) Field visit and observation is scheduled with the necessary logistical arrangement as depicted in Attachments 1 and 2.

2) Focus group discussion is the other methodology that will be used with different groups of project participants (farmers, farmers group, kebele administration, woreda administration etc) and partner office staff.

3) Secondary source of information is also important to enable the evaluation team to assess overall situation of the project (assessing interventions and achievements including in the sites that will not be covered by the visit). Therefore, evaluation team will review

documents (made available by the contractor) for quantitative data. The review of documents will include:

- Annual, quarterly and other periodic reports (2002 Semi-annual, 2003-2005 annual report and 2006 Semi-annual reports)
- Project proposal and annual work plan documents
- Documentations of MOA, revisions, restructuring, etc.
- Reports of partner organizations
- Monitoring and Evaluation plan
- All assessments/study Reports and baseline survey report
- Other relevant documents

Team composition: The active members of the RIT representing FSPCDPO, ARARI, BoARD, EPLAUA, USAID, and AMAREW as well as the Project Advisors will take part in this evaluation. The RIT Chairman is expected to be the team leader of this internal evaluation exercise. The Chairman will designate the secretary for recording the discussions and results of the evaluation.

Reporting/dissemination of Evaluation Results: The findings of the evaluation will be circulated to all evaluation team members for comment (within one month time) and finally discussed in detail by the RIT in its next regular meeting and then decide on how and to whom to distribute the final report, i.e. stakeholders found appropriate by the RIT.

Next Steps: The RIT will use the results in developing recommendations for future actions, annual work plan development, phasing out strategy and next steps for the Project.

Attachment 1. Revised AMAREW Project RIT Internal Evaluation Schedule, August 03 -12, 2006

Date	Depart		Arrive		Lodging
	Place	**Time***	**Place**	**Time***	
Thursday **Aug. 03/06**			Bahir Dar	Any time	Bahir Dar
Friday **Aug. 04/06**	Bahir Dar	7:00	Sekela	10:00	Bahir Dar
	Sekela	12:00	Bahir Dar	16:00	
Saturday **Aug. 05/06**	Bahir Dar	7:00	Nefas Mewicha	11:00	Nefas Mewicha
Sunday **Aug. 06/06**	Nefas Mewicha	7:00	Sekota	14:00	Sekota
Monday **Aug. 07/06**	Sekota	7:00	Hara	15:00	Woldiya
	Hara	17:00	Woldiya	18:00	
Tuesday **Aug. 08/06**	Woldiya	7:30	Sirinka	8:00	Dessie
	Sirinka	10:00	Haik	12:00	
	Haik	17:00	Dessie	18:00	
Wednesday **Aug. 09/06**	Dessie	7:00	Debre Berhan	16:00	Debre Berhan
Thursday **Aug. 10/06**	Debre Berhan	8:00	Ankober	10:00	Debre Berhan
Friday **Aug. 11/06**	Debre Berhan	15:00	Addis Ababa	18:00	Addis Ababa
Saturday **Aug. 12/06**	Addis Ababa	7:00	Bahir Dar	18:00	Bahir Dar

*Military time

Attachment 2. AMAREW Project RIT Internal Evaluation Details of Activities to Visit (August 03 to August 12, 2006)

Date	Activities to Visit	Component to Evaluate*
Thursday **Aug. 03/06**	Arrive Bahir Dar	
Friday **Aug. 04/06**	**Gumet Watershed**; Farmer-based potato seed production and DLS, fruits and vegetables production, integrated watershed management, participation of DAs **ARARI HQs**; Meet Directors, visit tissue culture facilities, discuss linkage with farmer-based potato seed production	R, W, C, M R, C
Saturday **Aug. 05/06**	**Lay Gayint;** WOARD, FREGs, Farmer-based seed multiplication of cereals, New Watershed initiation	R, E, W
Sunday **Aug. 06/06**	**Yeku Watershed**; WOARD, integrated watershed management, area closure, fuel efficient stoves, potable water point **Sekota Research Center**; visit the center's facilities, on-farm research trials	R, E, W, C, L R, C
Monday **Aug. 07/06**	**Lenche Dima Watershed**; Gubalafto WOARD, integrated watershed management, gully rehabilitation, area closure, gabion wire box production	R, E, W, C, L
Tuesday **Aug. 08/06**	**Sirinka Research Center**; visit the center's facilities, on-farm research trials, seed multiplication **Tehuledere**; WOARD, apiary and honey production, fishery activities	R, C E, W, C, M
Wednesday **Aug. 09/06**	**Tehuledere (Haik)**; General discussion, travel to Debre Berhan	E, W, C, M
Thursday **Aug. 10/06**	**Debre Berhan Research Center**; on-farm research trials, farmer-based highland vegetable seed production	R, E, C, M
Friday **Aug. 11/06**	**Addis Ababa:** Wrap up discussion at the USAID Mission	
Saturday **Aug. 12/06**	Return to Bahir Dar	

*R = Research; E = Extension; W = Watershed management; M = Micro-enterprise development; C = Capacity Building; L = Land tenure and administration

Annex 2

Crop Production Technology Transfer Efforts in North Shewa: Achievements and Constraints

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Abstract: *Since the establishment of the Research, Extension and Farmers Liason Division at the former Sheno Agricultural Rresearch Center (Now Debre Berhan Agricultural Research Center) in 1998 technology transfer efforts has been made in the North Shewa Zone of Amhara Region. The technology transfer activities were largely sloping to crop production technology transfer efforts. The technology transfer activities were undertaken on wheat (three improved varieties and their production technologies), Barley (four improved varieties and their production technologies), Faba bean (two improved varieties and their production technologies), and Lentil (two improved varieties and their production technologies). The on-farm technology transfer efforts were intensified with a support obtained from the USAID/AMAREW Project This paper examines and documents these technology transfer efforts in North Shewa zone in terms of achievements and constraints.*

Key Words: Technology Transfer, Package

1. Introduction

Investment in agricultural research can only be justified on the basis that improved agricultural technologies would be developed and transferred to end users, which enable increase in agricultural production and productivity. In this regard, varies studies on Ethiopian agricultural research performance proved that numerous improved crop production technologies have been developed by the federal and regional agricultural research centers. However, the level of adoption of these technologies by farmers has remained very low.

In order to reverse this situation, efforts have been well underway by Research and Extension Liaison Divisions established in all the research centers found in the country. With the same objective of transferring improved agricultural technologies in its mandate area, the Research, Extension and Farmers Liason Division was established at the former Sheno agricultural research center (Now Debre Berhan Agricultural Research Center) in 1998.

Since the establishment of the division, varies efforts were undertaken to transfer improved agricultural technologies to farmers of North Shewa Zone in Amhara Region. In fact, the technology transfer efforts were largely sloping to crop production technologies. This was due to varies reasons such as lack of readily transferable technologies in other components of farming and lack of experience in livestock and natural resource technology transfer among division staff.

The methods used to transfer technologies were on-farm pre-extension demonstrations, field days, trainings and Farmers Research and Extension groups.

This paper deals with these improved crop production technology transfer efforts at Debre Berhan Agricultural Research Center in terms of major achievements and constraints.

2. Achievements

2.1 Bread Wheat Technology Transfer

Bread wheat is increasingly becoming an important cereal in the Highlands of North Shewa in terms acreage. It is mostly grown in areas between altitude of 2500 and 3000 m.a.s.l. The most important wheat production constraints in these areas are water logging, frost, poor soil fertility, terminal moisture stress as well as lack of improved wheat varieties which are adaptive to these production constraints.

In response to these production constraints, improved wheat varieties and crop management practices have been recommended by the respective research divisions of the center. Based on these research recommendations four improve bread wheat varieties (namely HAR 710, HAR 1709, HAR 604, and HAR 1899) and their production packages (agronomic recommendations comprising seed rate, drainage method and fertilizer rates) were demonstrated to farmers of North Shewa High lands.

In 1998, the improved Bread wheat variety HAR 710 (which farmers named ***Fuabey***) and its production package (seed rate of 175Kg/ha, 150Kg/ha Urea with 100Kg/ha DAP and hand made Broad Bed and Furrow drainage method) was demonstrated to farmers and an average yield of 27.4qt/ha was harvested from three demonstration sites at *Bakelo ,Keyit* and *Mush* areas while the local variety called *shemet* with farmers' method of production gave an average yield of 12.6qt/ha from the above three sites. However due to the susceptibility of the improved variety HAR 710 to yellow rust observed around Kulumsa areas the demonstration of this variety was terminated and other two promising improved bread wheat varieties (HAR 1709 and HAR 604) were put under demonstration program.

In 1999, demonstration of these varieties with their production packages were conducted at 7 sites around *keyit, mush,* atakilt and *wishawshign* and mean grain yield of 35.3qt/ha and 23.3qt/ha were observed from varieties HAR 604 (*Galama*) and HAR 1709 (*Mitike)* with their production packages respectively while the local cultivar *shemet* with farmers method of production gave mean grain yield of about 10.5qt/ha. In the evaluation of the technologies by farmers it is expressed that the two improved varieties have certain merits such as good palatability of the stocks by animals which makes them fit in to the farming system of the area and better water logging and frost resistance quality of the variety called HAR 604 (*Galama*) was appreciated. The farmers also indicated that the variety called HAR 1709 (Mitike) has problem of being short stocked, easily shading, thought it is relatively early maturing.

In the year 2000, demonstration of bread wheat varieties (Galama and Mitike) and their production package were continued on fourteen farmers' fields around DebreBerhan zuria areas. The average yield obtained from Galama and Mitike was 28.5qt/ha and 25.3qt/ha respectively while that of the local variety was 12.77qt/ha when it is unfertilized and 16.8qt/ha when fertilized. The marginal rate of return (MRR) for using Galama with its package of production instead of the local variety and the practice associated to it, was found to be the higher (121%) and the MRR for using Mitike and its package of production instead of the local variety with the traditional method of production was found to be 86%. However, the use of improved method of production with the local variety (Shemet) was not found to be economic though it gave higher yield than the use of shemet with traditional method of production.

In the year 2001, demonstration of improved bread wheat variety HAR 604 (*Galama*) with its production package was conducted around Kotu, Faji, Enewari, and Seladingay areas, and an

overall average of 26.28qt/ha was harvested. The method of demonstration was planting the improved variety with its production package adjacent to ET-13 with improved management, unlike the previous times where the local variety *Shemet* was used for comparison. This was for the reason that many farmers were using the improved variety ET-13 (which they named *Gulobal*) instead of the local variety. And the objective of the demonstration was just to introduce the improved variety HAR 604 as an alternative to ET-13. The result of the demonstrations conducted showed that HAR-604 with its production package gave an average yield of 26.28qt/ha. This was with yields ranging from 42.52qt/ha at Enewari to 13.80qt/ha at Faji. Et-13 gave an average yield of 21.97qt/ha ranging from 41.47qt/ha at Enewari to 13.07qt/ha at Kotu. Farmers have appreciated the improved variety HAR-604 for its being relatively early maturing than ET-13, as well as for its relative resistance to frost, and for its palatable stalk for animal feed.

After completing the demonstration activities on HAR 604 and its production package, a new improved variety HAR 1899 (Katar) and its production package was put under demonstration program in the year 2003. The demonstrations were conducted on 12 farmers' fields around Enewari and Mehal meda areas. The average yield obtained from HAR 1899 at Enewari was 36.13qt/ha while average yield of 22.44qt/ha was obtained around Mehal meda areas and the combined average yield was 29.29qt/ha. The yield obtained from the unidentified improved variety used as a comparison at Enewari was 29.93qt/ha and 25.08qt/ha at Mehal meda while the combined average yield for the unidentified improved variety used for comparison was 27.51qt/ha. However, on the Field days conducted around Faji the HAR-604 variety has shown slight susceptibility to rust.

In the year 2004, HAR 1899 gave highest yield of 47.22Qt/ha at ***Enewari*** While the lowest yield 8.89Qt/ha was obtained from demonstration plot conducted at ***Mehal meda*** and the mean grain yield of HAR 1899 obtained from ***Mehal meda*** areas is about 12.33Qt/ha. At ***Mehal Meda***, the minimum amount of grain yield obtained from ***Shemet*** was 9.59Qt/ha. At ***Enewari*** the mean grain yield of HAR 1899 obtained was 37.54Qt/ha while the mean yield obtained from HAR 710 was 31.70Qt/ha. At Molale, the mean grain yield of HAR 1899 obtained was 17.39Qt/ha while the corresponding figure for ***Shemet*** was 12.39Qt/ha.

In the year 2005, demonstration of HAR 1899 and its production continued around Molale, Mehal meda and Deneba areas and average yields of 23.00, 24.22 and 25.43qt/ha were found respectively. There was heavy infestation of yellow rust observed in all the locations, and all the varieties under production in the areas were found to be susceptible to the diseases except ET-13.

At present, seven released bread wheat varieties from Kulumsa A.R.C are under on-farm evaluation trails by Farmers' Research and Extension Groups established around Deneba, Mehal Meda and Faji areas.

Table 1. Over all average yields obtained from demonstration sites for the improved and local varieties

Variety	Yield (t ha^{-1})
HAR 710 (Fuabey)	**2.7**
HAR 604 (Galama)	**3.0**
HAR 1709 (Mitike)	**2.6**
HAR 1899 (Katar)	**2.9**
ET-13	**2.6**
local var. (Shemet) with farmers' method of production	**1.0**
Shemet with improved production method	**1.6**

2.2 Food Barley Technology Transfer

The cool highlands of North Shewa areas are suitable to barley production. In fact, barley is a traditional staple crop in theses areas having various home uses. Barley is grown in both *Belg* and *Meher* seasons on fields fertilized with manure and manure-ash mixture. The average productivity of Barley in North Shewa doesnot exceed 10.5qt/ha (CSA, 203). The most prominent yield limiting factors for baley production in these areas are frost, water-logging and poor soil fertility.

Following the release of the first barley variety Miserach, the demonstration of food barley had been conducted around Ankober, Asagirt, DebreBerhan Zuria, and Tarmaber since 1999 cropping season. The demonstrations were conducted in both 'belg' (short rain season) as well as Meher (long rain season). Especially the 'belg' demonstrations were conducted around Ankober and Asagirt that are known areas for their higher 'belg' production in area coverage and productivity.

However, around Ankober areas demonstration of barley has also been conducted during Meher, in addition to the aforementioned Meher producing areas. In all this areas field days were conducted and farmers have given their opinion about the technology. Accordingly, they have indicated that Miserarch has high productivity, high tillering capacity, weed suppressing quality, good Capacity to withstand hail damage, and early maturing potential to escape early shower and frost damage moreover it is white in color for good market price.

The demonstrations were conducted in such away that the improved and farmers method and varieties could easily be compared. The improved methods include varieties (*miserach and shege*), seed rate (125Kg/ha), fertilizer rate (41/46 N-P2 O5), one hand weeding at 25-30days after emergence, 2-3 times ploughing frequency and sowing date (around mid June). Whereas, the farmers method is use of local varieties without fertilizer and no weeding.

The results of the demonstrations showed that the improved variety *Miserach* and its Production package gave higher yields. *Miserach* with its package gave a mean grain yield of 28qt/ha while shege with its package and the local check gave mean grain yields of 21.99 and 16.25qt/ha respectively. Partial budget analysis showed that *miserach* and its production method gave an MRR of 68.3% yet the variety called *Shege* with its package of production is not found to be economic. In evaluation of the technologies by farmers it is expressed that Miserach fits well in the farming system of Ankober areas that it can be used for Belg season production because of its relatively early maturity which makes it escape the dangers of hail in July and August

In the year 2000, the results of the demonstrations showed that the improved variety *Miserach* and its Production package gave higher yields. *Miserach* with its package gave a mean grain yield of 31.42qt/ha while the local check (local variety; *Nech Gebs,* without fertilizer and no weeding) gave mean grain yields of 14.84qt/ha.

In 2001 the demonstrations were conducted in both the *belg* and *Meher* seasons on a total of 12 farmers' fields. The mean yield obtained from miserach was 34.78qt/ha while the local variety with improved management gave 30.22qt/ha and the local variety with farmers method of barley production gave 22.86qt/ha.

In 2002 demonstration of *Miserach* was conducted only on the *belg* season around *Asagirt* and *Mezezo* on six farmers fields and *Miserach* with its production package gave 33.47qt/ha while the local barley variety with improved management gave 20.52qt/ha.

For the following cropping seasons Misrach variety were disseminated through the zonal agricultural department. For this, woreda offices of agriculture took the variety and no more pre-extension demonstration of Misrach variety were be conducted by the center.

In the fall of 2004, another two food barley varieties (named *Basso* and *Mezezo*) which are suitable for *Belg* season production were released by DBARC. At present, these varieties and their production packages are being demonstrated to farmers around Mezezo, Asagirt and Ankober areas. These varieties are found to be susceptible to head smut of barley, which necessitates the use of seed dressing fungicides.

Farmers' Evaluation of improved barley variety Mezezo and Basso shows that both of them have long spike and hence very good yield potentials, their black colour is also preferred for home consumption. Basso is better in productivity but more Susceptible to Smut than Mezezo, and both of them are late maturing (take over 160 days), which might expose them to hail storm. The year by location combined performance of these varieties is shown in Table 2.

Table 2. Overall yield performance of barley varieties under demonstration in North Shewa

Barley varieties	**Mean yield (t ha^{-1})**
Food Barley varieties demonstration results (Meher seasons):	
Average yield of **Miserach**	2.6
Average yield of **Local variety with improved management:**	2.0
Average yield of **Local variety with traditional crop management:**	1.6
Belg season food barley variety demonstration results	
Average yield of **Miserach (Belg season):**	3.6
Average yield of improved variety **Basso:**	2.6
Average yield of improved variety **Mezezo:**	2.4
Average yield of **Local variety with improved management:**	2.3

2.3 Potato Technology Transfer

Potato is a very important food and cash crop. It is one of the cheapest sources of energy with a great potential to supply high quality food with in a relatively short period of time .The production of potato per unit land is the highest for potato among the major food crops such as corn, wheat and rice. However, potato production in the North Shewa Highlands is severely constrained by many biotic and abiotic stresses such as diseases and low yield potentials of local cultivars. To avert this situation, a good deal of research endeavor has been made and some promising potato production technologies have been developed.

Since the year 2000, demonstration of improved potato varieties with their production package has been conducted in the highlands of North Shewa around *Ankober* , Mehal meda, Debre Berhan and *Molale.* The sizes of the demonstrations were 100m^2 each. The package contained: sowing date (early June), spacing (75cm x 30cm between rows and between plants respectively), fertilizer rate (110/90 N-P_2O_5). Farmers who have participated in the demonstration were given advice as to how to make diffused light store for potato. Field days were arranged to make more number of farmers aware of the technology.

In the year 2000 and 2001 potato (Menagesha and Tolcha) had been demonstrated in the highlands of North Shewa, specifically around Ankober, Molale and Mehalmeda. Menagesha variety had shown very good yield in all the locations; with an average yield of 239.9qt/ha ranging from 272.5 qt/ha at Ankober to 207.35 qt/ha at Molale in the year 2000. During 2001 cropping season Menagesha had shown an average yield of 139 qt/ha, ranging from 148.5 qt/ha at Ankober to 133.25 qt/ha at Molale. Also Tolcha variety was demonstrated at Ankober during the Belg season of 2001 cropping season. But due to scarcity of rain it provided a yield of only 56.5 qt/ha.

Following the release of the improved potato varietes named Gorebella in 2002 and Gera in 2003 by DBARC, several demonstrations wee conducted around Mush, Molale, Mehal meda, Ankober, Asagirt, Mezezo and Atatye. Yield results of the demonstrations are preseted in Table 3. The over all mean yield of *Gorebella* was 305.25qt/ha, while that of *Gera* was 279.17qt/ha.

Farmers of all the locations have appreciated these two potato varieties for their good yield. And during the field days farmers express their interest towards these varieties. At present sufficient awareness has been created among farmers regarding the importance of these varieties and there is a huge demand for seeds of these varieties which is above the capacity of DBARC. Hence, other GOs and NGOs should be involved in the area of potato seed production and dissemination to meet the growing demand for seeds.

Table 3. Potato demonstration results by year and location

Variety	**Yield in qt/ha**				**Mean**
	2002	**2003**	**2004**	**2005**	
Gorebela	305.27	344.00	281.9	286.1	**305.25**
Gera	-	320.40	265.1	231.9	**279.17**
Number of sites	6	12	15	6	
Location	Ankober, Mush, Molale	Ankober, Mehal Meda, Ataye, Molale, Mush	Ankober, Mehal meda, Ataye, Molale, Mush	Mezezo, Asagirt, Molale	

2.4 Faba Bean Technology Transfer

Faba bean is an important component of the mixed farming system of North Shewa because it is used for crop rotation. It is also an important component in farmers' food habit. Faba bean is cultivated annually on nearly 12700ha of land in North Shewa; however, its production level remained low and stagnant which is an average of about 5-7qt/ha (CSA, 2003) its production is constrained by biotic and abiotic stresses such as frost, wilt/root rot, poor genetic potential of local varieties.

After the release of two faba bean varieties (Lallo and Dagm) by DBARC in 2002, the research-extension division of the center began to demonstration of these varieties and their improved production package (120kg/ha seed rate, 100kh/ha DAP and one hand weeding 35 days after emergence) forming farmers research groups in Enewari and pre-extension demonstrations in Ankober, Mehal meda and Molale woredas. These varieties have high yielding potential and resistance to black root rot which is a major yield limiting factor of faba bean produced on vertisols.

The demonstrations were conducted in such a way that each farmer's plot was divided into three equal plots. On one of the three plots, the improved faba bean variety *Lalo or Dagm* was sawn with all its recommended agronomic practices, while on the second plot the local faba bean variety was sawn with the same agronomic practices like that of the improved varieties. On the third plot, the local variety was planted with farmers' cultural practice.

Table 4. Results of Pre-extension demonstrations of faba bean in the Highlands of North Shewa 2002-2005

Location	Number of demonstrations	Year	Yield (t ha^{-1})			
			Lallo	Dagm	Local variety with improved management	Local varieties
Ankober	3	2002	-	3.8	3.0	2.9
Mehal meda	3	2002	-	2.2	1.5	1.4
Molale	3	2002	2.1	1.3	1.2	-
Enewari	4	2002	1.9	2.0	-	-
molale	3	2003	1.3	1.2	1.2	0.9
Mehal meda	3	2003	5.7	4.0	2.4	2.7
Enewari	3	2003	2.5	2.3	2.5	2.0
Enewari	3	2004	2.3	-	1.8	1.2
Molale	3	2004	1.6	-	1.3	1.1
Ankober	3	2004	2.1	-	1.8	1.4
Mehal meda	3	2004	1.5	-	1.1	1.0
Enewari	3	2004	-	1.9	1.4	0.9
Molale	3	2004	-	1.4	0.9	0.6
Ankober	3	2004	-	1.7	1.7	1.3
Mehal meda	3	2004	-	1.7	1.3	0.7
Molale	3	2005	2.9	2.1	1.0	-
Mehal meda	3	2005	2.5	2.3	2.0	-
Ankober	3	2005	1.3	1.7	1.2	
Enewari	3	2005	1.7	1.4	1.0	
Over all average			**2.3**	**2.1**	**1.6**	**1.1**

From the demonstration plots, an over all mean grain yield of 22.55qt/ha was obtained from *Lalo* with its production package. The minimum and maximum amount of yield were 13.00 and 57.33qt/ha respectively. The improved faba bean variety *Dagm* with its production package gave an over all mean yield of 20.61qt/ha while the minimum and maximum yields obtained were 12 and 40qt/ha respectively. The local variety with improved method of production gave an average yield of 15.75qt/ha, while the minimum and maximum yields obtained were 9.14 and 30.28qt/ha respectively. The mean yield for the local variety with traditional method of production was found to be 11.07qt/ha, while the minimum and maximum yields were 5.62 and 28.89qt/ha respectively. A wide range of variation in yield exist due to variation in soil fertility and rain fall variation as well as due to the occurrence of Aphids in areas like Enewrie in some years.

Farmers' opinion about the varieties: Good germination potential, good and vigor stand, relatively resistant to aphids' attack and good resistance to root rot are among the good qualities of the varieties. Farmers have also indicated that the varieties were relatively resistant to aphid and frost damage as compared to the local varieties. However, farmers indicated that the improved varieties hold lower number of pods with relation to the height of their stalk.

At present, faba bean variety evaluation and evaluation of pesticides for Aphid control is being undertaken by FREG member farmers around Deneba, Faji and Mehal meda areas.

2.5 Lentil Technology Transfer

Lentil is an important component of the mixed farming system of North Shewa. It is used for crop rotation. It is also a good cash crop Yet, its production is constrained by biotic and abiotic stresses such as Aphids, terminal moisture stress, poor genetic potential etc…

Demonstration of lentil variety *Alemaya* and *Ada'a* was conducted around *Enewari* areas on seven farmers fields in the years 2003 and 2004. The demonstration was conducted using FREG (Farmers' Research and Extension Group). The group was composed of 8 farmer in the year 2003 and 12 farmers in 2004.

In the year 2003 two lentil varieties called *Ada'a and Alemaya* were demonstrated on the plots of four of the group members. The demonstrations were conducted in such a way that each farmer's plot was divided into three equal plots. On one of the three plots, the improved variety *Alemaya or Ada'a* was sawn with all its recommended agronomic practices, while on the second plot the local lentil cultvar was sawn with the same agronomic practices like that of the improved varieties. On the third plot, the local cultivar was planted with farmers' cultural practice.

In the year 2004 improved lentil variety *Alemaya* gave mean grain yield of 17.20qt/ha while the local lentil variety and the improved variety *Ada'a* gave 14.99 and 3.65qt/ha respectively. In the year 2004 only *Alemaya* and the local lentil variety were planted on three farmers' fields for the reason that farmers didn't want to plant the improved variety *Ada'a* for the reasons indicated below. The mean lentil yield obtained from the improved variety was only 9.25qt/ha while the local variety gave 7.59qt/ha. On average improved lentil variety *Alemaya* gave 17.95% yield advantage over the local lentil variety. This low level of yield of both varieties is because of heavy infestation of Aphids occurred in October 2004.

In the year 2005, demonstrations were undertaken on three farmers' fields and average yield of 17.9qt/ha was obtained from *Alemaya* and its production package while the local lentil variety with improved method of production gave 15.75qt/ha and the local variety with farmers method of production gave 13.2qt/ha.

Though Farmers in the group evaluate the demonstration at each stage of growth, at the end a field day was organized to show farmers, extension personnel and other development workers of the area. After hot discussion, Alemaya variety has got a greater appreciation than that of the Ada variety due to its higher productivity, dense straw for animal feed, relative resistant to frost damage, relative resistant to root rot wilt. However, they have raised their fear of its lower market price due to its seed coat color that is new for the area. As far as the Ada variety is concerned it had lower productivity, some infertility problem, shutter its seed while harvesting. It also had problem of wilting before seed setting and susceptible to powdery mildew.

Moreover, farmers also indicated that though most farmers use fertilizer to lentil, it only facilitates the time of maturity. But the earlier the maturity date, the lower the seed weight will be. So farmers wanted to try the variety called *Alemaya* without fertilizer application. This idea coincides with the results of a study on food legumes which indicated that there was no response of lentil to fertilizer application where three rates (45, 90, 135 kg/ha) and two sources of P_2O_5 (TSP and DAP) were used, neither the rates or the sources showed marked differences for seed yield (Asfaw T. et.al 1994).

3. Constraints

A number of constraints have been faced in the process of transfer of these technologies. Among which the following are worth mentioning:

- Lack of participation of Woreda agricultural development experts and development agents, which is part of the national problem of loose linkage among actors engaged in agricultural development in the country.
- Lack of seeds for wider dissemination especially that of Potato and Barley. This is due to the absence of organizations which will multiply seeds of potato, barley, faba bean, etc…
- Lack of man power and experience of staff to work in the area of livestock technology transfer which made the technology transfer efforts be largely sloping to crop technology transfer.

Future Directions

- Establishing and straightening Farmers' Research and Extesion Groups in all Woredas of North Shewa Zone so that technology evaluation and extension would be group based which will enable to reach more number of farmers and increase the level of farmers' participation.
- Starting and strengthening livestock technology demonstration
- Strengthening multiplication and dissemination of improved seeds by farmers themselves
- Undertaking diffusion study to follow up the dissemination of demonstrated technologies

Reference:

1. Asfaw Telaye, Geletu Bejiga, Saxena, Mohan C., and Solh, Mahmoud B (eds.) 1994. Cool-season food legumes of Ethiopia. Proceedings of the first National Cool-season Food legumes Review Conference, 16-20 December1993, Addis Ababa, Ethiopia. ICARDA/ Institute of Agricultural Research. ICARDA: Allepo, Syria Vii + 440 pp.
2. CSA (2003), Agricultural Sample Survey Report.

Annex 3

AMAREW Project Pilot Watershed Management Integrated Watershed Development Accomplishment Report

(2003- 2006)

Introduction

Many parts of the Amhara National Regional State (ANRS) located in northern Ethiopia, which for generations supported a mix of highly productive agriculture and natural biodiversity have become severely degraded due to over utilization. The high pressure from human and livestock population accompanied with low level of technology resulted in mis management of land resources, which in turn resulted in sever land and natural resource degradation. As a consequence, the majority of farmers in the ANRS are unable to generate incomes adequate to provide basic food needs to sustain family livelihoods.

Rural communities who live and cultivate lands on these highlands depend on them for water supplies, crop and animal production, fuel-wood and grazing, are in dire need of support to be able to manage these resources in effective and sustainable manner.

Since its start in July 2002 the **A**mhara Micro-enterprise development, **A**gricultural **R**esearch, Extension and **W**atershed management (AMAREW) Project, has been engaged in multi-faceted and integrated rural development activities in six extension targeted Woredas and three pilot watersheds. Its work encompasses agricultural research, extension, watershed management, micro-enterprise development and capacity building. Under its watershed management component, two pilot watersheds, Yeku in Sekota and Lenche Dima in Gubalafto, have been operational since 2003 and one other new pilot watershed has been initiated in Gumet in Sekela woreda August 2005.

Watershed Management Goals

To effectively conserve and manage the natural resource through comprehensive and integrated community based participatory watershed management approach, and thus ultimately increase agricultural production and productivity including income and attaining food security of the watershed community in a sustainable manner.

Objectives

- To reduce the current level of land and water resource degradation caused by deforestation, overgrazing and soil erosion;
- To increase crop production by using in situ soil moisture conservation, better performing crop varieties with improved practice and integrated pest management approach;
- To reduce the current shortage of fuel wood, fodder, construction materials and farm implements;
- To increase livestock production and productivity;
- To establish effective credit system for input supply;
- To test alternative approaches to watershed management;
- To improve over all income and attaining food security at watershed level.

Expected results

- Integrated watershed management planning and implementing capacity established within ANRS, using participatory methodologies, with BOARD leadership and broad institutional support;
- Replicable watershed management activities in operation at selected pilot sites, using participatory methodologies serving as learning sites for the community, researchers and extension agents;
- Soil erosion minimized and better moisture conservation achieved;
- Fodder trees introduced and forage and livestock productivity improved;
- Degraded hillsides regenerate and speeded up environmental rehabilitation;
- Foods and feed deficit will be improved and livestock disease incidence will be minimized;
- Crop and livestock production improved as a result food security attained at watershed level

Pilot watershed characteristics

No	Characteristics	Pilot watersheds		
		Yeku	**Lenche Dima**	**Gumet**
1	Location, - Zone	Wag Himra	North Wollo	West Gojjam
	- Woreda	Sekota	Gubalafto	Sekela
	- Kebele	Woleh 06	Laste gerado	Awsa guder
2	Total area	582 ha	1546 ha	508 ha
3	Altitude range	2050-2360 masl	1520 –1890 masl	1900–2440masl
4	Average rain fall	800 mm.	667 mm.	1500 mm
5	Total population	730	3375	
6	No of households	210	865	249
7	Average land holding	0.75	0.46	
8	Household Level of capital goods			
	➢ With pair of oxen	14%	23%	11%
	➢ With one draft animal	86%	86%	28%
	➢ With no draft animals			61%

Major problems of the pilot watersheds

- Moisture stress and frequent drought scarcity of water both for humans and livestock;
- Low crop productivity owing to poor fertility, erratic rainfall distribution, high input cost, and soil erosion;
- Deforestation that resulted in shortage of wood for fuel, construction, and farm implements;
- Crop pests and diseases;
- Shortage of livestock feed;
- Human and livestock health problems;
- Shortage of oxen;
- Lack of cash, and;
- Seed insecurity.

Proposed watershed intervention during the project period by sub sector

No	Activities by sub sectors	Unit	Yeku	Lenche Dima	Gumet
I	**Soil and water conservation (land productivity improvement)**				
1	Grass strip	Km	32	142	67
2	Stone bund (stone faced soil bund)	"	107	6	44
3	Soil bund	"	-	74	82
4	Check dam construction	"	1.374	2.772	1
5	Hill side terrace	"	112.1	223	
6	Micro basin	No			50000
7	Trench	"	26.21	-	
8	Retention ditch	"	-	47	
9	Cut- off drain	"	2.3	8.2	3.4
10	Water ways	"	2.1	12	3.3
11	Sisal seedling planted	No	534000		
12	Retaining wall (gabion)	Km	-	2.5	0.3
13	Manuring		50 % of hh	50% of hh	
14	Crop rotation, contour plowing, shilshalo and inter cropping				
15	Farmer training	No	90	200	165
16	Dry Road construction				6.3
II	**Water harvesting**				
1	Hand dug well	N o			5
2	Diversion weir construction	"			1
III	**Forestry and agro forestry**				
1	Seedling production	No	625,000	2,177000	

No	Activities by sub sectors	Unit	Yeku	Lenche Dima	Gumet
2	Seedling planting	"	625,000	2,177000	
3	Area closure & enrichment planting	Ha	80	150	20.16
4	Alley cropping				39
5	Vegetated soil conservation measure	"	50	160	10
6	On farm trees protected and managed	"	200	800	
7	Agro forestry plantations	"	5		
8	Trees and shrubs planted on farms and in gullies	"	-	33	
IV	**Crop production**				
1	Introduction of improved early maturing crop varieties ➢ Sorghum (maize) ➢ Teff ➢ Wheat	Qt " " "	93 8 25 60	43 23 20 -	205 28 39 137
2	Introduction of vegetable seeds	Kg			180
3	Purchasing of oxen through credit	No	63	100	80
4	Fertilizer				
5	➢ DAP ➢ Urea	Qt "	100 50	100 50	335 270
6	Tie ridgers	No	39	44	
7	Row planter	"	39	44	
8	Improved storage structure	"	100	202	
9	Establishment of IPM	"	10	22	
10	Compost preparation	"			10
11	Training for farmers	No	205	702	200
V	**Livestock production**				
1	Goat/ sheep restocking	"	240	1400	150
2	Chicks	"	900	4200	300
3	Provision of langstroth bee hives	"	35	-	
4	Provision of forage seed ➢ Siratro seed ➢ Cowpeas ➢ Vera no and Rhoades seed ➢ Stylo seed ➢ Rhodes grass seed	Kg " " " " "	 4.8 675 12 - -	 _ _ _ 43.2 32.4	150
5	Provision of shovel and pick axes	No	100	400	
6	Provision of veterinary service				
7	Development of bull service station	No			1
8	Farmers training	"	270	900	
VI	**Socio economic**				
1	Strengthen the service cooperative				
2	Strengthen linkage with relevant institution				

Integrated watershed development accomplished at Lenche Dima Pilot watershed

No	Activities	Unit	2003		2004		2005		to Jun30, 2006		Total	
			Target	Achieved	Target	Achieved	Target	Achieved	Target	Achieved	Target	Achieved
I	**Soil and water conservation**											
1.	Area closure	Ha	10	10.5	75	75	75	70	75	113	235	268.5
2	Micro basin	No	10000	6560	125000	15115					135000	21675
3	Hillside terrace	Km	30	12.5	19	52.5		256	90	88.14	139	409.14
4	Trench	No	-	-	3000	4445	5300	2216	5000	7996	13300	14657
5	Bund construction	Km	30	7	-	-	-	-	-	-	30	7
6	Cutoff drain	"	4	3	-	-	-	-	-	-	4	3
7	Check dam construction (stone + gabion + sand bag)	M^3	1000	1500	1000	1300	525	439	1000	2785	3525	6024
8	Gully head treatment	M^3							170	60	170	60
9	Gully revegetation	Ha	5	3	1.5	1.5	1.75	1.75			8.25	6.25
10	Sowing of forage seed on closed area	Ha	-	-	-	-	-	-	-	35	-	35
11	Multipurpose seedling planting		-	-	90000	50000	-	-	-	-	90000	50000
12	Seedling planting		70000	38600	150000	72000	200,000	79,120	150000		570000	189600
13	Live fencing (vegetative fencing)	Km			30	3					30	3
14	Feeder road construction	Km			7	2.4					7	2.4
15	Gabion wire box production	No			15	15					15	15
II	**Water harvesting and supply**											
1	Dome construction	No			5	5	10	11	5	4	20	20
2	Pond maintenance	"			13	13					13	13
3	Construction of water point	"			1	1	-	-	2	2	3	3
4	Pump house Construction	"					-	-	1	1	1	1
5	Water pipe lining	M	2,080	2,080			-	-	1200	1200	3280	3280

III	**Crop production**		**2003**		**2004**		**2005**		**2006**		**total**	
1	Provision of improved variety of cereals and pulses (sorghum, teff, maize, haricot bean)	Kg	-	-	29	35	18	18.5	1700	2000	1747.5	2053.5
2	Provision of vegetable seeds	Kg	-	-	-	-	12	-			12	-
3	Provision of fruit seedling	No	-	-	-	-	500	804	-	2507	500	2587
4	Provision of sweet potato cutting	No	-	-	55550	25000	-	-	-	-	55550	25000
	Farm implement						-	-	-	-		
5	Shovel	No	-	-	100	100	-	-	-	-	100	100
6	Digging hoe	"	-	-	100	100	-	-	-	-	100	100
7	Rake	"	-	-	50	165	-	-	-	-	50	165
8	Watering can	"	-	-	50	50	-	-	-	-	50	50
IV	**Livestock production**						-	-				
1	Forage seed distribution	Qt	7.8	7.8	15	1.2	15	8			37.5	16.7
2	Goat restocking	No	65 hh	94 hh	300	135	360	-	80	66		
3	Brooding	"			65	31					65	31
4	Chicks distributed	No							2400			
V	Land administration											
1	Boundary demarcation	Ha					1400	1400			1400	1400
2	Provision of temporarily land certificate	No					895	745			897	745
VI	**Training and capacity building**											
1	CWMT member Management and leadership (COLTA) training	No	32	27	32	29					**64**	**56**
2	Training of women on Improved stove & home improvement	"	10	10	280	210	60	30	30	30	380	280
3	Training on live stock management (goat, poultry, apiculture)	"	105	131	149	90					254	221
4	Integrated pest management		49	48							49	48
5	Soil and water conservation		13	13							13	13
6	Fuel saving stove produced	**"**							-	88	-	88

Integrated watershed development accomplished at Yeku Pilot watershed

No	Activities	Unit	2003		2004		2005		To Jun30, 2006		Total	
			Target	Achieved	Target	Achieved	Target	Achieved	Target	Achieved	Target	Achieved
I	**Soil and water conservation**											
1.	Area closure	Ha	10	12	28	28	60	30	50	30	148	100
2	Hillside terrace	Km	20	19	56	160	50	350	10	34	156	563
3	Trench	No			32000	5700	30000	21000	-	6200	62000	32900
4	Micro (eyebrow) basin	"	1000	6968	10000	2500	30000	2020	-	-	41000	11488
5	Check dam construction (stone + gabion)	M^3	500	400	225	1007	14953	3000	1922	465	29088	4472
6	Sediment storage dam (SSD)	M^3			72	96	400	280	-	75	472	376
7	Percolation pit	No					20000	500	500	798	20500	1298
8	Bund construction		10	13.8	11	18.4				0.8	21	33
9	Bund maintenance									22		22
10	Zai pit	No								3119		3119
11	Seedling planting		60,000	18,271			70000	8599	30000		130000	26870
II	**Water harvesting and supply**											
1	Spring development	No					2	1			2	1
2	Hand dug well	"			50	1	10	3	-	2	60	4
3	Hemispherical pond	"			-	2			-	1		2
4	Trapezoidal pond				16	4					16	4
III	**Crop production**											
1	Provision of improved variety of cereals and pulses (teff, triticale, wheat, and sorghum	Qt			34	11	47	61	10	10	91	82
2	Provision of vegetable seeds	Kg				500	26	32.2	8		26	532.2
3	Compost making	M^3			192	84	-	960			192	1044

IV	**Livestock production**		**2003**		**2004**		**2005**		**2006**		**Total**	
1	Forage seed distribution	Qt	-	-	6.5	16.33	7	4	23		13.5	20.33
2	Goat restocking	No	-	-	176	174	420	420			596	594
3	Small ruminant fattening	"	-	-	100	96					100	96
4	Bee colony purchasing	"	-	-	150	150			30		150	150
5	KTB hive purchasing	"	-	-	120	60					120	60
6	Top bar purchasing	"	-	-	4200	1753			420		4200	1753
7	Chicks distributed	No							2400			
V	**Land administration**		-	-								
1	Provision of temporary land certificate	No	-	-	-	-		1927				1927
VI	**Training and capacity building**											
1	CWMT member Management and leadership (COLTA) training	No	32	32	-	-	-	-			32	32
2	Farmers training on moisture conservation, compost making, soil and water conservation		38	35	110	103	-	-	30	30	178	168
3	Training on HIV/AIDS & family planning		27	27	-	-	-	-			27	27
4	Farmers training on improved stove and house management		22	23	-	-	-	-			22	23
5	Fuel saving stove produced		-	-	-	-	-	-	-	26		26
6	Farmers training on livestock management /poultry, fattening, beekeeping and forage/		99	104	64	136	-	-	-	-	163	240

Integrated watershed development accomplished at Gumet Pilot watershed

No	Activities	Unit	2006	
			Target	Achieved
I	**Soil and water conservation**			
1.	Area closure		75	12
2	Check dam construction		700	56
3	Gully revegetation			
4	Bund maintenance			220
5	Forage seed planting			
6	Seedling planting			
7	Establishment of community nursery		1	1
II	**Crop production**			
1	Provision of improved variety of cereals and pulses	**Qt**	15	45.5
2	Provision of improved potato	**Qt**	150	7
3	Provision of vegetable seeds	**Kg**	-	36
4	Provision of sweet potato cuttings	**No**	-	4750
5	Introducing of temperate fruit	"	300	1054
III	**Training and capacity building**			
1	Farmers training on agro forestry /for 3 days/	"	32	31
2	Conduct experience sharing tour	"	13	13
	Conduct farmers field day on improved potato growth performance evaluation	"	-	60

Result observed

- Hillside closure integrated with moisture harvesting structure speed up environmental rehabilitation
- Degraded gullies made productive and used as source of feed and fuel wood
- Fuel saving stove production at Yeku watershed not only help the women group make money, it also contribute to reduction of deforestation
- Water point development, top priority for both watershed community solved the problem of shortage of clean water for human and livestock
- Rain water harvesting by means of dome used for sustainable house hold fruit and vegetable production, which beyond arresting soil erosion has improved house hold income
- Striga resistance sorghum varieties yielding high under the menace, Varieties such as **Gobiye and Abshir** are now widely grown in farmer's field of the Project site of Lenche Dima used

Annex 4

Summary of plans and achievements of the extension related activities of the AMAREW Project, 2003-2006

I. Dissemination of seeds and seedlings

S.N	Crop	Unit	Year								Total		
			2003		2004		2005		2006				
			Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	% achieved
1	Teff	Qt	0	0	48	39	61	86.9	38	70	147	195.9	133.3
2	Wheat	Qt	0	0	101	127.3	155	88.8	135	171	391	387.1	99.0
3	Maize	Qt	0.25	6	8	7	30	17.9	34	13	72.3	43.9	60.8
4	Barley	Qt	0	0	4	1.7	10	0	27.5	0	41.5	1.7	4.1
5	Sorghum	Qt	0.5	3.5	2	4	18	4.8	22	10	42.5	22.3	52.5
6	Fingure Millet	Qt	0	0	0	0	0	0	0	2	0.0	2.0	
7	Triticale	Qt	10	4	90	36	15	14.5	0	0	115.0	54.5	47.4
	Cereals total	**Qt**	**10.75**	**13.5**	**253**	**215**	**289**	**212.9**	**256.5**	**266**	**809.3**	**707.4**	**87.4**
8	Faba bean	Qt	0	0	20	5	25	81.5	24	70	69.0	156.5	226.8
9	Chick pea	Qt	1.1	0.5	29	45	51	43.5	48	63	129.1	152.0	117.7
10	Field pea	Qt	0	0	10	3	6	0	0	0	16.0	3.0	18.8
11	Haricot bean	Qt	0	0	30	6	20	10	15	5	65.0	21.0	32.3
	Pulses total	**Qt**	**1.1**	**0.5**	**89**	**59**	**102**	**135**	**87**	**138**	**279.1**	**332.5**	**119.1**
12	Ground nut	Qt	0	0	0	0	2	0	4	0	6.0	0.0	0.0
14	Linseed	Qt	0	0	3	0.06	6	0	2	0	11.0	0.1	0.5
	Oil crops total	**Qt**	**0**	**0**	**3**	**0.06**	**8**	**0**	**6**	**0**	**17.0**	**0.1**	**0.4**
	Cereals, legumes & oil crops total	Qt	**11.85**	**14**	**345**	**274.06**	**399**	**347.9**	**349.5**	**404**	**1105.4**	**1040.0**	**94.1**
15	Potato	Qt	35	6	97	6	114	0	150	0	396.0	12.0	3.0
16	Sweet Potato in “000”	No	30	30	412	1250	37	2	75	75	554.0	1357.0	244.9
17	Swiss Chard	Kg	0	0	30	0	26	1	0	0	56.0	1.0	1.8
18	Carrot	Kg	0	0	10	0	101.5	109.5	30	0	141.5	109.5	77.4
19	Pepper	Kg	0	0	45	0	27	51.5	5.7	50	77.7	101.5	130.6

20	Beet root	Kg	0	0	10	0	20	52	9	0	39.0	52.0	133.3
21	Tomato	Kg	0	0	2	0	15	38.3	2	0	19.0	38.3	201.6
22	Lettuce	Kg	0	0	0	0	0	0	5	0	5.0	0.0	0.0
24	Cabbage	Kg	0	0	10	0	18	65	16	10	44.0	75.0	170.5
25	Cassava cuttings in “000”	No	1	1	0	0	14	0	0	0	15.0	1.0	6.7
26	Shallot	Kg	1	2	5	0	7.7	15.5	0	0	13.7	17.5	127.7
27	Garlic	Qt	1	3	30	5	20	25	55	0	106.0	33.0	31.1
28	Various vegetable crop seed	Kg	0	0	5	115.9	109	0	17.5	142	131.5	257.9	196.1
29	Coffee seedlings	No	28	28	14	14	0	0	0	0	42.0	42.0	100.0
30	Cotton	Kg	0	0	0	0	1	0	0	0	1.0	0.0	0.0
31	Various fruit tree seedlings	No	0	0	2	10	0.5	0	3.85	1.31	6.4	11.3	178.1
32	Sweet orange seedlings in “000”	No	0	0	0.5	0	2	0	0	0	2.5	0.0	0.0
33	Mango & Avocado	Kg	0	0	0	0	200	0	600	0	800.0	0.0	0.0
34	Mango seedlings in “000”	No	0	0	10.3	0	2.3	1.53	0	0	12.6	1.5	12.1
35	Papaya	Kg	0	0	0	0	10	0	5	0	15.0	0.0	0.0
36	Papaya Seedlings in “000”	No	0	0	0	0	0	1.1	0	0	0.0	1.1	
37	Papaya and Cassava seedlings in ‘000’	No	0	0	14	0	0	0	0	0	14.0	0.0	0.0

II. Dissemination of agricultural tools, equipment and other inputs

No	Description of items	Unit	Year								Total		
			2003		2004		2005		2006				
			Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	% achieved
1	Different types of farm tools such as tie ridgers, armstrong plow etc	No	0	0	4060	10	47	26	70	60	4177	96	2.3
2	Pick axe, rake, shovel	No	0	0	0	683	800	0	0	0	800	683	85.4
3	Drip irrigation Barrel	No	0	0	0	0	25	0	45	0	70	0	0.0
4	Pedal Pump	No	0	0	20	7	0	19	80	9	100	35	35.0
5	Water can	No	0	0	50	0	0	0	0	0	50	0	0.0
6	Small size model DLS for potato	No	0	0	0	25	18	0	6	6	24	31	129.2
7	Rope and washer pump	No	0	0	30	5	16	0	0	0	46	5	10.9
8	Simple solar light devise	No	0	0	0	0	3	0	0	0	3	0	0.0
9	Spinning machine	No	0	0	0	0	0	0	2	0	2	0	0.0
10	Improved stove frame	No	0	0	13	0	0	0	0	0	13	0	0.0
11	Hay box brooder	No	0	0	170	35	155	20	98	0	423	55	13.0
12	Modern bee hive	No	0	0	0	0	100	115	0	0	100	115	115.0
13	Kenyan top bar/Lang strong bee hive	No	0	0	210	88	0	0	0	0	210	88	41.9
14	Queen excluder	No	0	0	0	290	50	0	75	0	125	290	232.0
15	Transistory bee hive	No	0	0	0	0	150	140	130	30	280	170	60.7
16	Top bars	No	0	0	16100	16592	9000	0	10150	0	35250	16592	47.1
17	Eye goggle	No	0	0	0	0	0	15	0	0	0	15	
18	Protective clothes, gloves, vale, overall & plastic shoe	No	0	0	40	36	60	153	20	40	120	229	190.8
19	Apiary working tools such as smoker, Chiesel, brush, sprayer etc	No	0	0	15	0	35	53	60	40	110	93	84.5
20	Wax printer	No	0	0	0	0	0	0	1	1	1	1	100.0
22	Honey excractor	No	0	0	3	0	0	0	0	0	3	0	0.0
23	Carpenter hand tool for bee hive making	No	0	0	0	0	5	0	40	40	45	40	88.9
24	Frame wire	Kg	0	0	0	0	1	0	0	0	1	0	0.0
25	Casting mold	No	0	0	2	0	0	0	0	0	2	0	0.0

III. Project accomplishments through Livestock Development

S.N	Description of activities	Unit	Year								Total		
			2003		2004		2005		2006				
			Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	% achieved
1	Three month old chicks	No	0	0	2303	0	0	192	600	0	2903	192	6.6
2	Day old chicks	No	0	0	7200	0	7250	2500	12780	0	27230	2500	9.2
3	Chick feed	Qts	0	0	24	0	0	0	0	0	24	0	0.0
4	Bee Keeping												
5	Provision of bee coloney	No	0	0	150	0	370	0	460	0	980	0	0.0
6	Provision of Wax	Kg	0	0	50	0	85	602.5	660	837	795	1439.5	181.1
7	Provision of Rams	No	0	0	0	0	125	125	180	30	305	155	50.8
8	Provision of Ewes	No	0	0	0	0	0	0	90	60	90	60	66.7
9	Provision of billy goats	No	0	0	0	0	0	0	0	0	0	0	
10	Provision of Nanny goats	No	0	0	0	0	75	0	0	0	75	0	0.0
11	Provision of rams and ewes	No	0	0	0	0	15	82	0	0	15	82	546.7
12	Goat restocking	No	0	0	0	0	0	0	150	100	150	100	66.7
13	Provision of improved goats	No	0	0	0	0	0	0	120	164	120	164	136.7
14	Provision of mules for fish product transportation	No	0	0	0	0	0	0	2	0	2	0	0.0
15	Forage seed supply	Kg	0	0	24	103	136	0.033	58	0	218	103.033	47.3
16	Backyard forage development	ha	0	0	80	0	180.2	31	0	0	260.2	31	11.9
17	Under sowing	ha	0	0	90	0	90	0	0	0	180	0	0.0
18	Forage production on bunds	ha	0	0	140	0	2	0	0	0	142	0	0.0
19	Support to private group nurseries	No	0	0	2	0	0	0	0	0	2	0	0.0
20	Improving pasture	ha	10	0	0	0	0	0	0	0	10	0	0.0
21	Drug supply for CAHWs	Birr	0	0	15000	0	0	0	0	0	15000	0	0.0
22	Facilitating mobile animal health clinic service	Birr	0	0	0	0	5000	0	0	0	5000	0	0.0
23	Provision of Sinar donkey	No	0	0	2	0	6	0	0	0	8	0	0.0

IV. Project accomplishments through Natural Resource Development

S.N	Description of activities	Unit	Year								Total		
			2003		2004		2005		2006				
			Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	% achieved
1	Construction of checkdam	Km	0	0	0	5	0	0	0	0	0	5	
		M^2	0	0	113.4	0	2330	15.6	2650	2905	5093	2920.6	57.3
2	Construction of diversion ditch	Km	0	0	0	0	0	0	25	25	25	25	100.0
3	Construction of hill side terrace	Km	0	7.1	59	0	60	11	55	0	174	18.1	10.4
4	Construction of Farm land terrace	Km	0	0	100	0	160	0	15	0	275	0	0.0
5	Gully rehabilitation	Km	0	0	0.5	0	3	5	510	0	513.5	5	1.0
6	Construction of small scale dam	M^2	0	0	900	0	800	0	0	0	1700	0	0.0
7	Cut-off drain	M^2	0	0	360	0	0	0	0	0	360	0	0.0
		Km	0	0	1.9	0	0	0	0	0	1.9	0	0.0
8	Water way construction	M^2	0	0	0	0	0	0	0	1621	0	1621	
9	Microbasine in '000'	No	0	0	1500	0	12012	0	18	0	13530	0	0.0
10	Bund stabilization	Km	0	0	150	0	150	140.3	1445	0	1745	140.3	8.0
11	Trench construction in '000'	No	0	0	11	0	10020	4200.7	15	0	10046	4200.7	41.8
12	Eye burrow basine construction in '000'	No	0	0	11.5	0	22	39.5	0	0	33.5	39.5	117.9
13	Recharging pit	No	0	0	2000	0	15	2	5	0	2020	2	0.1
14	Compost preparation /pit/	No	0	0	40	40	0	0	0	0	40	40	100.0
		M^2	0	0	350	0	518	0	0	0	868	0	0.0
15	Construction of shallow hand dug well	No	0	0	400	0	0	0	0	0	400	0	0.0
16	Water harvesting structure with plastic	No	0	0	78	0	0	0	3	0	81	0	0.0
17	Trapidoizal & Hemispherical water tank	No	0	0	40	0	9	0	0	0	49	0	0.0
18	Provision of gabion wire	Kg	0	0	0	0	0	0	3000	2000	3000	2000	66.7
19	Provision of tree seed of MPTs	Kg	0	0	0	301	190	0	85	0	275	301	109.5
20	Provision of polythene tube	Qt	0	0	0	1297	15	0	7.5	0	22.5	1297	5764.4
21	Pitting & Planting	No	0	0	496	272	620	1153.7	244	58.5	1360	1484.2	109.1
22	Gully plantation	Km	0	0	1.9	0	0	0	0	0	1.9	0	0.0
	Seedlings in '000'	No	0	0	0	0	0	0	5	0	5	0	0.0
23	Area closure	ha	0	0	0	0	0	0	197	40	197	40	20.3

V. Training of Woerda experts, Development Agents and Farmers

S.N	Type of training	Trainee Source	Year								Total		
			2003		2004		2005		2006				
			Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	Planned	Achieved	% Achieved
1	Technological packages	SMS	0	0	0	0	9	0	0	0	9	0	0
2		DAs	0	0	0	28	27	0	0	0	27	28	103.7
3		Farmers	0	115	0	0	0	0	312	0	312	115	36.9
4	Tie-ridging practice	DAs	0	0	0	0	0	0	3	0	3	0	0.0
5	Insitu moisture harvesting	Farmers	0	0	0	0	0	0	60	0	60	0	0.0
6	Cereal and horticultural crop	DAs	20	19	0	0	0	0	3	0	23	19	82.6
7		Farmers	55	55	0	0	150	0	90	0	295	55	18.6
8	Coffee production	DAs	0	0	6	0	0	0	0	0	6	0	0.0
9		Farmers	0	0	60	109	0	0	0	0	60	109	181.7
10	Fruit tree establishment	Farmers	0	0	130	0	0	0	0	0	130	0	0.0
11	Highland fruit tree production & DLS	Woreda staff	0	0	5	0	0	0	0	0	5	0	0.0
12		DAs	0	0	65	50	0	0	9	0	74	50	67.6
13		Farmers	0	234	238	0	60	0	90	0	388	234	60.3
14	Minimize post harvest loss	Farmers	43	20	0	0	0	0	30	0	73	20	27.4
15	Improved grain storage	Farmers	0	0	0	0	180	60	0	0	180	60	33.3
16	SS irrigation and other water harvesting technology	Woreda staff	0	0	0	0	0	0	2	0	2	0	0.0
17		DAs	0	0	11	0	0	0	3	0	14	0	0.0
18		Farmers	0	0	204	0	300	30	150	0	654	30	4.6
19	Poultry management	Woreda staff	0	0	0	0	50	0	2	0	52	0	0.0
20		DAs	19	14	20	0	0	0	3	0	42	14	33.3
21		Farmers	118	95	245	0	90	0	60	37	513	132	25.7
22	Hay box brooder management	Woreda staff	0	0	4	0	1	0	10	0	15	0	0.0
23		DAs	0	0	12	20	0	3	15	0	27	23	85.2
24		Farmers	0	0	50	0	125	38	381	0	556	38	6.8
25	Managing dairy animal	Farmers	0	0	0	0	30	0	0	0	30	0	0.0
26	Managing fattening animal	Farmers	0	0	0	0	30	0	0	0	30	0	0.0

27	Managing small ruminant	DAs	14	14	0	0	0	0	9	0	23	14	60.9
28		Farmers	40	57	0	0	95	0	480	115	615	172	28.0
29	Bee Keeping	Woreda staff	0	0	4	0	0	0	0	0	4	0	0.0
30		DAs	30	30	34	0	0	0	17	3	81	33	40.7
31		Farmers	81	99	284	120	180	90	369	30	914	339	37.1
32	Fishery and fish net making	DAs	14	11	0	0	0	0	0	0	14	11	78.6
33		Farmers	50	49	60	0	0	0	15	0	125	49	39.2
34	Basics of animal health	DAs	0	0	40	0	0	0	0	0	40	0	0.0
35		CAHW	32	39	21	0	0	6	3	3	56	48	85.7
36		Farmer	0	0	30	0	0	0	30	30	60	30	50.0
37	Back yard forage development	DAs	0	0	23	0	0	0	0	0	23	0	0.0
38		Farmer	0	0	240	49	165	0	90	0	495	49	9.9
39													
40	Different Natural Resource management practice	woreda staffs	0	0	0	0	0	0	2	0	2	0	0.0
41		DAs	0	0	0	0	0	0	3	0	3	0	0.0
42		Farmers	0	0	0	0	0	0	90	0	90	0	0.0
43	Closure area management	woreda staffs	0	0	6	0	0	0	0	0	6	0	0.0
44		DAs	0	0	4	0	0	0	0	0	4	0	0.0
45		Farmers	0	0	60	0	0	0	0	0	60	0	0.0
46	Gabion making	woreda staffs	0	0	0	0	0	0	1	0	1	0	0.0
47		DAs	0	0	0	0	0	0	6	0	6	0	0.0
48		Farmers	0	0	0	0	0	0	24	0	24	0	0.0
49	Soil and water conservation	DAs	4	4	48	0	0	0	0	0	52	4	7.7
50		Farmers	58	58	110	0	75	0	0	0	243	58	23.9
51	Joint forest management	DAs	2	2	0	0	0	0	0	0	2	2	100.0
52		Farmers	0	14	0	0	0	0	0	0	0	14	
53	Different water harvesting techniques	woreda staffs	0	0	0	0	0	0	2	0	2	0	0.0
54		DAs	0	21	11	0	0	0	3	0	14	21	150.0
55		Farmers	0	0	105	181	180	36	6	0	291	217	74.6
56	Compost preparation	DAs	13	13	0	23	0	0	0	0	13	36	276.9
57		Farmers	75	78	350	1327	0	0	60	60	485	1465	302.1

58	Environmental protection	LAU committee	0	0	0	0	0	0	6	0	6	0	0.0
59		Farmers	0	0	0	0	0	0	63	0	63	0	0.0
60	Irrigation practice/SSI & drip irr/	DAs	20	19	0	0	0	0	0	0	20	19	95.0
61		Farmers	55	55	80	181	50	36	0	0	185	272	147.0
62													
63	Integrated extension package & extension technique	Woreda staff	0	0	0	0	0	0	40	0	40	0	0.0
64		DAs	0	0	0	0	0	0	45	0	45	0	0.0
65		Farmers	115	115	0	0	0	0	0	0	115	115	100.0
66	Participatory research and extension	DAs	10	8	0	0	0	0	0	0	10	8	80.0
67		Farmers	30	30	45	43	0	0	0	0	75	73	97.3
68	Follow up training for FREG members	Woreda staff	0	0	0	0	0	0	36	0	36	0	0.0
69		DAs	0	0	0	0	3	0	36	0	39	0	0.0
70		Farmers	0	0	0	0	75	0	345	0	420	0	0.0
71	Marketing of agricultural product	DAs	10	10	0	0	0	0	0	0	10	10	100.0
72		Farmers	30	30	0	0	0	0	0	0	30	30	100.0
73	Refreshment training	DAs	27	27	0	0	3	0	0	0	30	27	90.0
74	Community Organization Leadership Skill	Woreda staff	0	0	0	0	0	0	26	0	26	0	0.0
75		DAs	0	0	0	5	0	0	38	0	38	5	13.2
76		Farmers	0	0	0	75	78	38	115	0	193	113	58.5
77	HIV/AIDS prevention	DAs	79	58	0	0	0	0	0	0	79	58	73.4
78		Farmers	155	138	0	0	60	60	0	0	215	198	92.1
79	HIV/AIDS & Family planning	DAs	79	58	0	0	0	0	0	0	79	58	73.4
80		Farmers	155	147	80	105	0	0	0	0	235	252	107.2
82	Nutrition and food habit	DAs	15	16	0	0	3	0	0	0	18	16	88.9
83		Farmers	80	78	155	105	30	30	30	0	295	213	72.2
84	Fuel wood saving stove	DAs	39	25	11	0	0	0	0	0	50	25	50.0
85		Farmers	133	146	325	90	120	100	30	0	608	336	55.3
	Improved spinning, pottery & weeving	Farmers	0	0	15	84	51	0	10	0	76	84	110.5
	Home management	DAs	0	0	11	0	0	0	0	0	11	0	0.0
		Farmers	0	0	140	0	60	60	0	0	200	60	30.0

Annex 5

Stakeholders Present During the Field Visits and Wrap Up Discussions

Sekela Woreda

Field visit

Farmers	WOARD staff	RIT Team	Project staff
Wubet Konne (Ms) (Seed production collective action group member)	Belew Dagnachew (Fruits & Vegetables expert, AMAREW Project Focal Person)	All team members except Ato Amlaku Asres	All except the research advisor
Nebiyou Ayalew (seed production collective action group member)	Ateka Aychew (Crop development DA at Gumet		
Biruh Kassa(seed production collective action group member)	Minyichil Dagnaw (Natural resource development DA at Gumet)		
Fekadu Mulu(seed production collective action group member)	Abebaw Wubetu (Livestock development DA at Gumet)		
Mezgebu Mihret(seed production collective action group member)			

Wrap up

Administration team	WOARD staff	RIT Team	Project staff
Worku Alemayehu (Sekela Woreda Deputy Administrator)	_____ (Deputy bureau head)	All team members except Ato Amlaku Asres	All except the research advisor
	Belew Dagnachew (AMAREW Project focal person)		

Lay Gayint Woreda

Field visit

Farmers	WOARD staff	RIT Team	Project staff
Ato Getnet Achenef (FREG Chair)	Worku Mekonen (Ext. Team Leader)	All team members	All except the research advisor
Ato Belay Tadesse (FREG Sec.)	Belayhun Dessie (Hort. Expert)		
	Alemnew Shumie (Livestock DA, Yedoro Kebele)		
	Azanaw Tamirat (Crop DA, Yedoro Kebele)		

Wrap up

Administration team	WOARD staff	RIT Team	Project staff
Akele Fente, Head Bureau of Education and Acting Administrator	Worku Mekonen (Ext. Team Leader)	All team members	All except the research advisor

Sekota Woreda

Field visit

Farmers	WOARD staff	RIT Team	Project staff
	Nuru Mohammed (WOARD bureau head)	All team members	All except the research advisor
	Astatke Kassahun (Agronomist & Project Focal Person)		
	Daniel HabteGiorgis (Food Security and Disaster Prevention team leader)		
	Tadesse Mesay (Natural Resource Development DA at Yeku)		

Wrap up

Administration team	WOARD staff	Research staff	RIT Team	Project Staff
_____, Wag Hemra Zone administrator	Nuru Mohammed (WOARD head)	Semahegne _____, (Sekota ARC manager)	All team members	
Hailu Misew, Sekota Woreda administrator	_____, (WOARD deputy head)			All except the research advisor

Gubalafto Woreda

Field visit

Farmers	WOARD staff	Research staff	RIT Team	Project staff
Mohammed _____ (Facilitator for the AMAREW Project)	Desalegne Abraha (AMAREW Project Focal Person)	Belay Tseganeh (Agro-meteorology & Natural Resource)	All team members	All except the research advisor
7 Other Farmers	Habtamu Arega (natural Resource Development DA at Hara)	Fikru Mekonen (Plant Breeding)		
		Habtamu Tadesse (Forestery)		
		Legesse Admassu (Agronomy)		
		Sisay Demeku (Natural Resource & Hydrology)		

Wrap up

Administration team	WOARD staff	EPLAUA staff	FSPCDPO staff	Sirinka RC	RIT Team	Project staff
Tsega Arage (Gubalafto Woreda administrator)	Mulugeta Dagne (Deputy Bureau Head)	Tadesse Tefera	Abdurazak ____	Habtamu Tadesse	All team members	All except the research advisor
Misganaw _____ (Gubalafto Woreda deputy administrator)	Dessalegne Molla (Natural resource expert & AMAREW focal person)			Sisay Demeku		
	Habtamu Arega (natural resource DA at Lenche Dima)					

Sirinka Research Center

Field visit

Research staff	RIT Team	Project staff
Dr. Wondimu Bayu (Center Manager)	All team members except Ato Amlaku Asres & Ato Alemnew Alelign	All except the research advisor
Belay Tseganeh (Agro-meteorology & Natural Resource, AMAREW Project focal person)		
Fikru Mekonen (Crop Breeding)		
Habtamu Tadesse (Forestery)		
Legesse Admassu (Agronomy)		
Sisay Demeku (Natural Resource & Hydrology)		
Fisseha Worede (Crop Breeding)		
Asmare Dejene (Entomology)		
Addisu Tesfaye (research-Extension)		

Tehuledere Woreda

Field visit

Farmers	WOARD staff	Administration staff	RIT Team	Project staff
Abdu Jemal (pedal pump beneficiary at Gubeya (012) Kebele)	Yusuf Aragaw (AMAREW Project Focal Person)	Mohammed Nurye (Woreda administrator)	All team members except Ato Amlaku Asres & Ato Alemnew Alelign	All except the research advisor
Seid Edris (pedal pump beneficiary at Gubeya (012) Kebele)	Moges Genzeb (Livestock development expert)			
Mohammed Ali (beneficiary of various technologies at Kete (05) Kebele	Berhanu Belay (Supervisor)			
Seid Abate (IPM group Chairman) and his group mates	Mohammed Seid (Crop development DA)			
	Meaza Mekonen (Kete Kebele (05) crop development DA)			
	Behailu Getahun (Kete Kebele (05) Livestock DA)			
	Zeray Tadesse (Gubeya Kebele (012) Natural resource development DA)			
	Fenta Mulat (Gubeya (05) Crop development DA)			

Wrap up

Administration team	WOARD staff	RIT Team	Project staff
Mohammed Nurye (Tehuledere Woreda Administrator)	Moges Genzeb (Livestock development expert)	All team members except Ato Amlaku Asres & Ato Alemnew Alelign	All except the research advisor
	Yusuf Aragaw (Irrigation expert & AMAREw Project focal person		

Deber Berhan Research Center

Field visit

Farmers (FREG members)	Research staff	RIT Team	Project staff
Bzuayehu Masresha	Semahegne Asredie (Center mamanager)	All team members except Ato Amlaku Asres & Ato Alemnew Alelign	All except the research advisor
Wondimu Mulugeta	Tilaye Teklewolde (AMAREW Project focal person)		
	Abdu Yassin (Technical assistant)		

Wrap up

Research staff	RIT Team	Project staff
Semahegne Asredie (Center Manager)	All team members except Ato Amlaku Asres & Ato Alemnew Alelign	All except the research advisor
Tilaye Teklewold (Research-Extension, AMAREW Project focal person)		
Wondafrash Mulugeta (Pulse improvement)		
Roman Yilma (Animal Health)		
Gizaw Desta ((Natural Resources)		
Dereje Tadesse (Animal Breeding)		
Dereje Hailu (Forestry and Agroforestry)		
Kemelew Muhe (Crop Breeding)		

Annex 6

Acronyms

ACDI/VOCA	Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance
ACSI	Amhara Credit and Saving Institution
AMAREW	Amhara Micro-enterprise development, Agricultural Research, Extension and Watershed management
AMSEIDB	Amhara Micro and Small Enterprises and Industries Development Bureau
ANRS	Amahra National Regional State
ARARI	Amhara Regional Agricultural Research Institute
ARC	Adet Research Center
BoARD	Bureau of Agriculture and Rural Development
COLTA	Community Organization Leadership Training for Action
CoP	Chief of Party
DA	Development Agent
DBARC	Debre Berhan Agricultural Research Center
DLS	Defuse Light Storage
EPLAUA	Environmental Protection, Land Administration and Use Authority
FREG	Farmer-Research-Extension Group
FSPCDPO	Food Security Program Coordination & Disaster Prevention Office
F-t-F	Farmer to Farmer
HH	House Hold
ICM	Integrated Crop Management
ISP	Integrated Strategic Plan
IPM	Integrated Pest Management
MED	Micro Enterprise Development
MoU	Memorandum of Understanding
NGO	Non Governmental Organization
ORDA	Organization for Rehabilitation and Development in Amahra

PA	Peasant Association
RC	Research Center
R-E	Research Extension
RELC	Research Extension Liaison Committee
RIT	Regional Implementation Team
SARC	Sirinka Agricultural Research Center
SoW	Scope of Work
USAID	United States Agency for International Development
ToR	Term of Reference
WOARD	Woreda Office of Agriculture and Rural Development