FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Innovation Lab for Small-Scale Irrigation: Ethiopia

Workshop proceedings documentation for partners meeting

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"The Feed the Future Innovation Lab for Small-Scale Irrigation works to enhance food security and reduce poverty by developing and introducing gender-sensitive, small-scale irrigation systems into food and agriculture production on small farms."

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Contents

Acronyms

AMU	Arba Minch University
ARARI	Amhara Region Agricultural Research Institute
BDU	Bahir Dar University
DSS	Decisions Support Systems
GW	Groundwater
HH	House Hold
ILSSI	Laboratory for Small Scale Irrigation
IWMI	International Water Management Institute
LWRC	Land Water Resources Center
RW	Rope and Washer
SARI	Southern Agricultural Research Institute
SWAT	Soil and Water Assessment Tool
SWIM	Soil and Water Integrated Model
SW	Surface Water
TDR	Time Domain Reflectometry
TOR	Terms of Reference
WFD	Wetting Front Detector

Executive Summary

Feed the Future Innovation Laboratory for Small Scale Irrigation (ILSSI)-Ethiopia is a five year (2013-2018) USAID funded cooperative research project aiming to improve food production, nutrition, and accelerate economic growth within a sustainable environmental framework in Ethiopia, Ghana and Tanzania. IWMI East Africa and Nile Basin Office organized a partners' workshop from 20-21 August 2015 in Addis Ababa to evaluate the activities of the project undertaken in project year 2 (October 2014 - September 2015); this was the first year of project implementation. The aim was to identify research gaps, define research priorities and refine work plans for year 3 in Ethiopia. The meeting reviewed achievements, gaps and challenges from its first implementation year and refined objectives with the various partners for year 3.

Small-scale irrigation development for sustainable management of the available water resources was the main theme of the two days partners' workshop that tackled biophysical, socio-economic and cross-cutting issues. Throughout various sessions, presentations and discussions enabled a better understanding about on-going and planned activities among partners within and across sites. Among other things, participants identified research gaps in the fields of technology, gender, nutrition and environmental sustainability that are crucial for the achievement of the project's goals. Through interactive sessions, partners held discussions on the optimal mechanisms for data collection, management and standardization of data sharing and reporting mechanisms.

This report summarizes the main points that were discussed, as well as conclusions and recommendations drawn from the meeting. Presentations from the plenary and group discussion sessions along with workshop program and lists of participants are annexed and also available on an IWMI-ILRI project wiki space (http://ilssi.wikispaces.com/).

1 Background

ILSSI is a five year project that started in 2013, aiming at increasing food production, improving nutrition, accelerating economic development and contributing to the protection of the environment through improved access to small-scale irrigation technologies. The project seeks to achieve these objectives through identifying, testing and demonstrating technological options in small-scale irrigation and irrigated fodder production.

The project takes a holistic approach based on partnership and engagement with local institutions and other partners to ensure continual learning; responsiveness to local demands needs and realities; support for national goals and initiatives; and the uptake of outputs and recommendations by farmers, researchers, policymakers and investors. Ethiopia, Ghana and Tanzania are the three countries that the project is being implemented. In Ethiopia, there are 5 principal sites: Robit-Bata (Bahir Dar Zuria), Dangishta (Dangila) both in Amhara region, Bochesa (Adami Tulu) in Oromia, and Kerikicho/Angacha and Upper Ghana in Lemo district in SNNPR.

The International Water Management Institute (IWMI) leads the research component, field implementation and stakeholder engagements in the above mentioned three target countries, in partnership with the International Livestock Research Institute (ILRI) and the International Food Policy Research Institute (IFPRI), with overall project leadership from Texas A & M University. The North Carolina Agriculture and Technology is also a partner on the project. Research implementation has been taking place with national partners in each country.

2 Objectives of the Workshop

IWMI East Africa Office organized a two days partners evaluation and planning workshop in Addis Ababa at ILRI campus from 20-21 August 2015, to review the implementation of the project in the action sites of Ethiopia, to identify success stories, challenges and gaps observed in the second year term as well as to define priorities and to develop work plan for year 3.

3 Workshop overview

The workshop had over 30 participants drawn from partner institutions involved in the project (including AMU, ARARI, BDU, SARI, Send A Cow/SEDA, IWMI and ILRI and the woreda focal persons). It was formally launched by Dr. Petra Schmitter (who also led the overall organization of the event with the support of Dr. Gebrehaweria Gebregziabher, Dr. Prossie Nakawuka and Rahel Mesganaw**.** Dr. Simon Langan, Head of the IWMI East Africa & Nile Basin Office joined the meeting through skype on Day 1, where he had chance to follow the main results obtained from the group sessions and plenary discussions. He shared his insights on the four key elements: context, process, gaps and actions for the upcoming year.

Eleven presentations were made during the two-days meeting. The first day focused on exchanging experiences and evaluation of activities carried out in year 2. In order to enhance full participation of the partners and documentation process, the workshop was facilitated by the ILRI Communication & Knowledge Management experts Ewen Le Borgne (Day 1) and Peter Ballantyne (Day 2), while the overall documentation and compilation of the report done by Desalegne Tadesse, IWMI communication Officer.

The format of the meeting placed a lot of emphasis on experience sharing within and across sites among the various partners. Day 1 of the workshop was opened with an ice-breaker that required the participants to walk around for few minutes to identify any one who they didn't know, introduce themselves and share their expectations for the meeting. Knowledge sharing, identifying best irrigation technologies that can boost the agricultural development in Ethiopia, identifying barriers of technology adoption, knowing more about farmers' irrigation preferences, exploring best data collection and management mechanisms, and learning more about how to maximize the potential small scale irrigation for food crops and livestock fodder development were the key expectations of the participants for this meeting.

In the morning session, all partners presented their respective project responsibilities, implementation activities and progress. In the afternoon, they were divided into three groups to identify success, challenges and gaps in their respective sites: one group for partners working in the Northern sites: Dangila and Robit –Bata and two groups for partners working in the South sites; one group for Angacha and the other group for Lemo and Adami-Tulu. After the group session, groups presented briefly 3 main successes and 3 gaps of the past year and proposed 3 main activities for each site for the coming year. The identified gaps and research ideas on Day 1 were used on Day 2 to reshape the working plans and TORs for year 3.

The second day gave more emphasis on the research component of the project that shared views on the way forward: define priorities, develop news insights and action plan. Dr. Prossie Nakawuka (IWMI), Dr. Gebrehaweria Gebregziabher (IWMI) and Mr. Aberra Adie (ILRI) gave brief presentations on the biophysical, socio-economic and fodder related research gaps, respectively. The presentations mapped the identified research gaps by the participants on the first day against those identified by the CGIAR partners. In the afternoon, the national research partners presented briefly their main research objectives for the upcoming year.

4 Evaluating the progress of ILSSI across sites

Presentations were made by Dr. Petra Schmitter (IWMI), Dr. Seifu Tilahun (BDU), Dr. Mekonen Ayana (AMU), Kinde Teshome (Send A Cow), Bereket Zeleke (SARI) and PhD students Debebe Lijalem (BDU), Kassaw Beshaw and Demelash Wendemeneh (AMU).

4.1 Individual partner presentations

4.1.1 Overview of the ILSSI project and the way forward - Dr. Petra Schmitter (IWMI)

Dr. Petra's presentation outlined the main overview of the project and the rationale for organizing the partners meeting, including donors' feedback on year 2 activities. The significance of extensive engagement and consultation with partners, gaps in data collection, standardization and capacity building were also addressed. In turn, Dr. Petra urged the participants to pay special attention and address some key elements such as external evaluation form; environmental monitoring & mitigation plan, documentation of community engagement/capacity building, continued participation and support for students & publications in their year 3 plan.

4.1.2 Water lifting technologies in the Amhara Region - Dr. Seifu Tilahun (BDU)

Dr. Seifu provided a an overview of the BDU activities, explaining the experimental design, data collection & outcomes, challenges and lessons learned as well as their future plan. Dr. Seifu presented results from two water lifting technologies (pulley, rope and washer) and two water management strategies (crop water requirement and wetting front detectors) for the cultivation of irrigated onion, tomato and Napier grass. From the presentation, it became clear that farmers prefer different technologies at the 2 sites. While pulley is more preferred in Robit-Bata, Rope and Washer is more preferred in Dangishta (Dangila woreda). The delay of installation of technologies and low female representation, requests from farmers

to return back specific technologies, late start the project due to technology delays and conveyance issues with the Rope & Washer pumps were challenges underlined by BDU.

4.1.3 Napier grass as irrigated fodder - Asresu Yitayew (ARARI)

In the framework of forage production, ARARI (a research partner with ILRI for the Amhara region) in collaboration with ILRI and BDU introduced Napier Grass to be grown under irrigation to improve the feeds for livestock in the Robit-Bata site. In his presentation, Aresu highlighted results from a FGD they conducted on water sources, irrigated fodder development, the link between gender & irrigation, technologies they are using, challenges, tools, opportunities, lessons and the future plan of ARARI.

Low participation of farmers as 36 farmers showed interest at the onset of the project but only 17 volunteered to grow fodder during the past dry season. Additionally, the traditional feeding system and the dominance of Khat production in the area (as a means of immediate income source) affects the investment on dairy farms and were identified as main challenges by ARARI regarding the forage development.

Currently, the farmers are producing the fodder side-by-side with Khat. However, they are looking for better fodder varieties that can compete better with Khat as both Khat and Napier grass need considerable amounts of water in order to obtain high yields. In their package of future plan, they also will focus on the provision of training on feeding, breed improvement, feed trough construction, market assessment and strengthen the milk cooperative.

4.1.4 Water lifting technologies in Oromia and SNNPR - Dr. Mekonen Ayana (AMU)

Dr. Mekonen's presentation assessed the overall implementation of the project in Adami-Tulu and Lemo, planned deliverables/achievements, gaps, challenges and lessons learned, suggested improvements concentrating on two watersheds; Bochesa in Adami-Tulu and Upper Gana in Lemo. Two water lifting technologies: petrol pumps and rope & washer pumps were tested in Adami-Tulu and only rope & washer pumps were tested in Lemo district. The technologies are not fully utilized by the farmers, mainly the rope &washer, as most farmers in Adami-Tulu preferred motorized pumps and were reluctant to receive and use the rope and washer pumps. They also installed pressure sensor and weather station in the Bochesa watershed. However, the sensors vandalism and thefts are a major threat to monitoring efforts in this area.

Access to research sites due to the long distance between AMU and the sites and transport constraints, inability to closely follow-up data collectors activity, lack of safety of installed equipment's were presented as challenges they faced in the past year-.

4.1.5 Tomato production in Adami-Tulu - Kinde Teshome (Send A Cow)

Describing the objectives of the project, Kinde's presentation was more concentrated on the major activities that Send-A-Cow/SEDA have been doing in the Adami Tulu site and key achievements and challenges. Beneficiary selection, baseline survey, agronomic training, monitoring & follow up, developing progress reports, provisions of water lifting devices, seeds; pesticides and fertilizers, instituting credit systems were the activities done by SACE/SEDA. Kinde highlighted the lack of maintenance of water lifting technology, low follow-up by SEDA and poor farm land management of project plots by farmers; the frequent occurrence of crop diseases and pests, and high cost of pesticide were the main challenges during the preceding irrigation season. Rope and washer farmers did not perform well in the previous season as some of them preferred motor pumps; thus, they did not bother to make use of the rope and washer even after showing willing to receive and use it, some other farmers didn't receive the complete parts of the pump and thus would not use the pumps, the rest of the farmers whose rope and washers were functional planted the tomato but it failed after a few weeks. The tomato might have died due to a number of reasons that include: poor management as the plants might have been burnt by big amounts of UREA that was applied 10 days after transplanting and might have come in contact with the plants. The quality of irrigation water and the soil in some of these farmers' fields are of poor quality (i.e. saline irrigation water and sodic soils). The quality of the soils and irrigation water are going to be investigated further in the coming season.

On the way forward, they outlined the importance of training for the farmers in bookkeeping & financial literacy, the timely management of pests, and additional manpower to run the project at grassroots level.

4.1.6 Forage production under small scale irrigation in Angacha - Bereket Zeleke (SARI)

Similar to other presenters, Bereket also provided brief summary on the objectives of the project, a background that described the rationale of initiating irrigated forage development, major activities, results, impacts, challenges and future plans. Desho and Napier grasses are the irrigated fodder interventions in the site. Out of 36 farmers involved in the project 5 are female. Farmers in Angacha are overall very experienced in the irrigation of various horticultural crops using Rope and Washer pumps. He

compared the differences in terms of size (land coverage) before and after intervention which shows positive increases. Currently, almost all of the farmers involved in the intervention are very interested in growing irrigated fodder and have plans to expand the fodder production. Bereket mentioned early harvest of the grass was not common in the area, and that forage adoption rate of farmers increased.

The challenges they faced included: high turnover of Development Agents (DA's), labour requirement for irrigation and poor coordination with AMU, water shortage for irrigation of Napier grass because of prolonged (unusual) dry season- as a result the Napier grass wilted and hence the farmers were obliged to replant the grass (around 35% of the previously planted) whereas Desho grass persisted the moisture stress and performed better. Their future plans include: preliminary data collection and management for Desho and Napier grasses, irrigating the planted forage in dry season and evaluating forage yield, integration with dairy and small ruminant fattening to measure animal performance, to conduct lab analysis of feed samples and examine composition, evaluate the plan and to provide training and experience sharing field visits for farmers to wider irrigation sites.

4.1.7 PhD poster presentations

Posters were presented by the three ILSSI supported PhD students: Debebe Lijalem (BDU), Kassaw Beshaw and Demelash Wendmeneh (AMU). Posters explained the on-going work in Upper Gana (around Hosanna), Bochesa Watershed (Central Rift Valley area of Ethiopia) and Robit & Dangishta: assessments of water availability, impacts of water abstraction on ground and surface water, sustainability of ground and surface water for irrigated agriculture, the effects of different technologies on salinity and soil fertility, and water use efficiency of different irrigation technologies.

4.2 ILSSI project group evaluation

The group arrangement consisted of representatives of district office of agriculture and the research partners from the respective sites. Participants were divided into three groups; North group covering Danghista and Robit–Bata sites (BDU, ARARI), two South groups; one covering Angacha and Lemo (AMU), and other group covering Bochesa (AMU, SARI). Each group was tasked to identify the most important of the three elements for each site: success stories, challenges/gaps and action to be taken for the coming year based on the four major categories; **project implementation, research activities, capacity building & training and project communication**. Below is a summary of the group work results.

Amhara region:

Site	Success stories	Challenges/Gaps	Actions
Dangeshta, Dangila	1. IWMI-BDU-Woreda-Kebele integration to achieve project objectives 2. Technology adoption on wetting front detectors 3. Engagement of multipurpose cooperative in technology transfer	1. Low productivity of local seed varieties 2. Changes to the original research plan by introducing storage tanks and conveyance hoses 3. Instruments to collect data (GPS, current meter, auger, etc.) and supplies to data collectors (rain coat, rain boat, batteries, etc.) 4. Conveyance system on the lifting technologies 5. Female farmers participation was not easy and capacity building of female students is still lacking	1. Do research on conveyance systems 2. Use improved seeds that lead to better production 3. Involve more female farmers and recruit female students
Robit, Bahir-Dar Zuria	1. High level commitment of students involved in the project 2. Good support of BDU activities by the project	1. Conveyance problem 2. R&W was resisted to be adopted by farmers 3. Lack of continous	

	3. Good team working spirit observed 4. The hybrid tomato seeds grown were high yielding 5. Irrigated fodder was adopted	communication and sufficient commitment by kebele officials 4. Target farmers consider the technologies as aid from some NGO 5. Too much agro-chemical use required	

Oromia and SNNPR region:

Site	Success stories	Challenges/Gaps	Actions
Bochesa, Adami-Tulu	1. Access to technologies, improved inputs and willingness of beneficiaries to adopt them 2. Improved production and productivity - increased income 3. Involvement and success of female headed households was demonstrated 4. Partnering of different institutions (NGOs, GOs, Universities, and Research Institutions	1. Late delivery of inputs and supportive services like trainings 2. Time and labor requirement to operate R&W pumps 3. Safety problems related to watershed monitoring equipment 4. Lack of management attention by target farmers on research plots 5. Gender analysis and financial training not done yet 6.Regular follow-up of field implementation was poor	
Kerikecho, Angacha	1. Active participation and sense of ownership of woreda and kebele agricultural office 2. Fast establishment of Desho grass 3. involvement of appropriate farmers	1. Long dry season caused drying up of groundwater resources 2. Poor involvement of researchers during the planning phase 3. The tradition of using milk for only household consumption and not for sell 4. Late commencement of interventions 5. Delay in training 6. Untimely documentation for proper follow up 7. Delayed fund release	1. Replanting of elephant grass 2. Budget should be released on time, according to the plan 3. Use of smart phones for data collection for easy sharing

Upper-Gana, Lemo	1. Fodder and fruit production started 2. R&W, Wetting Front Detectors for optimum irrigation scheduling and irrigated fodder introduced 3. Trainings given to DAs and target farmers	1. Shortage of water in the dry season 2. Frequent R&W maintenance problems 3. Reluctance of some farmers to adopt the technologies 4. Limited number of farmers 5. Late installation of water lifting technologies 6. Long information chain for R&W maintenance 7. Lack of awareness 8. Limited resources	1. Implementation of technologies on ground 2. Experience sharing

4.3 Issues

Several common concerns emerged in the form of questions and answers from all of the groups, these included:

- Scaling-up the interventions, taking the example of Robit and Dangila
- Water technology preferences differ from site to site
- Engagement with the community and sample selection mechanisms
- Vandalism and theft of watershed monitoring devices, structures and the consequences (experience in Dangishta and Adami Tulu)
- Challenges in ensuring gender equity in the interventions
- Opportunities/potential of horticulture and forage intercropping to reduce land availability issues
- Access to market for fodder and the importance of improving the feeding system, follow-up and management, the nutritional values, comparison of the yield with other crops and local grasses

In general, all participants actively contributed and shared insights. Dr. Langan delivered his concluding remarks for this group work focusing on the four major points; **context, progress, gaps and actions**.

Context: Participants were urged to focus on innovation and capacity building in order to enhance engagement. It would be important to think about the field works and engagement and modeling to link with the interventions.

Progress: "When looking at the overall progress evaluation in Ethiopia, all the sites and activities taken place fall **under the good category**. So, what we need to do for the next year, has to move to the excellent category."

Gaps: He said, some the gaps didn't quite come through in the meeting such as: discussion on nutrition and women, multiple water use; credit as an opportunity or barrier; the role of institutions (formal or informal institutions) in irrigation. Are farmers are working individually or collectively, where do they get advice and how does it work?

As Simon mentioned they reaffirmed their commitment to maintain and consolidate the existing partnership and collaboration towards the objectives and goals under common frameworks in a coordinated manner in order to build synergies and innovations. It is every participant's responsibility to further develop and refine the priorities, and work plan based on the discussions, where more detailed information on the report of the workshop is to be found on the ILSSI website.

Finally, appreciating the participants for the comprehensive action plans they developed, he urged them to maximize their commitment for the implementation taking into account all the above ideas.

5 Refinement of ILSSI activities for year 3

Through a multidisciplinary framework, the panelists (Dr. Prossie Nakawuka (IWMI), Dr. Gebrehaweria Gebregziabher (IWMI) and Mr. Aberra Adie (ILRI)) highlighted the goals and objectives of the project, research component (innovation ideas) and development component (capacity building and engagement) in the domain of R4D. The presentation combined biophysical, socio-economic and fodder production related research gaps.

From the biophysical perspective, Dr. Prossie first revisited the main objectives of the overall research for development project which are increasing household access to irrigation technologies and hence improve the nutritional and economic status; improve water management for those farmers who have irrigation experience to ensure sustainable use of ground and surface water resources. The main gaps were linked to improving the water conveyance of the various lifting technologies, development of water harvesting systems to store water in seasons when its ample and be used in seasons when its scarce, understanding the irrigation dynamics and water competition between crops (e.g. Khat) effecting horticulture production

and water safety (e.g. pesticide transport) due to the multi-purpose use of the water resources and lifting technologies (e.g. irrigation, domestic and drinking, livestock), improving water productivity in vegetable and fodder production, ways of maintaining or improving soil health, and low-cost innovative ways of breaking the restrictive layer that prevents deeper manual well digging in the North sites. Participants added other research gaps including: mechanization of hard pan breaking and suggested continuing measuring productivity of hard pan plots even during the dry season, evaluation of efficiencies of the various water application methods, implementing some soil and water conservation practices and linking some of the government's soil and conservation measures to irrigation in the various sites, and performing field/watershed nutrient balances to in order to measure effect of small scale irrigation on the environment.

Dr. Gebrehaweria in his part outlined the socio-economic perspective of the project and shared his concerns on the visible constraints noticed on gender, nutrition and data management. Socio-economic research gaps identifies include: factors affecting small scale irrigation technology adoption and disadoption, social and economic factors influencing irrigation use and management and how to improve the current data collections tools.

On fodder irrigation, Aberra provided brief summary on the potential of forage development, its impact on livestock productivity (meat, milk, power) taking the case of Robit Bata, Angacha and Lemo. Aberra presented the following identified research gaps: exploring the potential of forage crops to break hard pans while providing feed options in Robit, impact of irrigated fodder on livestock productivity, exploring if fodder can be sold to earn an income, assessing benefits of intercropping forages with other major crops grown in the sites, and assessing the impact of fodder development on the livelihoods of women farmers in terms of improved income from dairy products.

5.1 Revisiting partner specific research activities

The national research partners (BDU, AMU, ARARI and SARI) revisited the research questions identified during the previous year to cater for relevant research gaps identified during the first day of the workshop. Research questions were revisited in the fields of gender, nutrition, irrigation engineering, water management, environmental sustainability or natural resource management and capacity building. Partners were asked to highlight synergies between research partners as well as data needs from other partners during their 5 min presentation. Afterwards, partners were asked to comment on each other's

plans. The partners came up with the following research gaps and activities that they are going to undertake in the coming year in addition to the researches and activities already started in the previous year:

Partner	Additional research plans and activities for next year
AMU	• An objective on assessing the impacts of conjunctive uses of surface and groundwater for irrigation on watershed hydrology (water balance, sediment etc.) • Improve efficiencies of agricultural water use • Assess different land use/management practices on sediment losses
ARARI	• Provide possible crop/forage intercropping options to intensity benefits from the small plots of land that farmers own • Assess possibilities of household income generation from sales of irrigated fodder • Identify factors that affect smallholder farmers' decisions on water lifting, conveyance and application technologies to grow irrigated fodder
BDU	• Include gender and nutrition analyses on evaluating the impact of lifting technologies on livelihoods • BDU opted to leave field testing or irrigated fodder to ARARI and concentrate on vegetables • Next season's hard pan treatments will be by biological means with forages like oats and other crops • Monitor nutrient and pesticide flows in rivers and groundwater • To try to have two irrigated crop seasons in this coming year • To try to involve at least one female student in the project
SARI	• Conduct feeding trials on the dairy cows owned by the target farmers using the harvested irrigated fodder • Measure chemical composition of the irrigated fodder (Desho and Napier) • Plan a field day where several demonstrations for farmers will be carried out • Demonstrate selling of fodder as a direct source of income

6 Discussions/reflections

Fruitful ideas and lessons learned emerged out of the two days interactive plenary, group sessions and discussions. Main outcomes are given below according to the main ILSSI themes: technology; multiple use; gender; nutrition; income/market; environmental sustainability; capacity building; data collection, management, modeling, and synergy development.

6.1 Technology

Water lifting technologies are installed in different sites of the country and used to support irrigation of horticulture and forage crops. Farmer preference is site specific and includes past experience of certain

technologies within the village. Especially, Rope and Washers seem to be less favorable in Adami Tulu, Lemo and Robit whereas it has a higher success rate in Dangila and Angacha[1].

As mentioned by Send A Cow, in Adami-Tulu R&W users did not actively manage their farms, because R&W is found to be labor intensive. Additionally, the low water level during the growing season requires further excavation of the well, increasing costs as the pipes from the rope and washer needs to be extended. In the area, motorized pumps are more effective since pumps from the river or the lake.

BDU reported similar issues in Robit. The technical analysis conducted on the efficiency of water lifting technology confirms that R&W owners performed lower in Robit as it required more labor (as wells are deeper) and more maintenance compared to the pulley. Moreover, the historical bad experience with rope and washers in the village and the conveyance problem related to the rope and washer increased the tendency of farmers to choose pulley in Robit. The opposite was experienced in Dangishta. Therefore, BDU recommends to follow the preferences of the farmers, i.e. to allow farmers to revisit their technology preferences. Farmers who were not satisfied are able to change their technology and corresponding credit scheme. This would result in an increase in pulleys in Robit and Rope and washers in Dangihsta.

6.2 Multiple Use

On top of the poster presentations outlining the initiatives to quantify water availability, including surface-groundwater interaction, issues such as water quality and water management (allocation, multi-use of water resources) were not addressed as expected. In this respect, from the plenary Dr. Michael Blummel (ILRI), Dr. Petra Schmitter (IWMI) and via skype Dr. Simon provided comments to strengthen multiple-use and water safety as water access increases its use for other activities in addition to irrigation (i.e. livestock, domestic and drinking water). Even within irrigation, farmers` preference on when and how much to irrigate needs to be thoroughly assessed (e.g. water competition). Dr. Michael also mentioned that in order to transform the Ethiopian farmers; smallholders need to be more efficient in multiple use and be market oriented. Therefore, we have to be context specific, making water the center piece of interventions, and efforts should focus on the issues of multiple use and prioritization taking in to consideration the available budget.

[1] The rope and washers in Angacha were not implemented by ILSSI but by another NGO a few years back. Angacha is used as a comparison with the neighboring site Lemo as farmers are more experienced in irrigation.

6.3 Gender

Although gender mainstream is crucial in R4D, and also one of the main objectives stipulated in the ILSSI project, the meeting recognized that the issue wasn't well addressed in the sessions and also the plans developed. The representation of female households in the interventions, emphasis on gender awareness and analysis, as well the sampling techniques show gaps in treating gender issues within the project.

Some of the statistics presented did not reflect the real representation of the women. In this respect, some pressing questions were made to presenters. These included: How do you select the farmers? (Was the sampling random?); Did you consider the whole interaction of the community (men + women) or just focused only on women? The rationale behind these question was that some presentations didn't give the general proportion of female household heads in the community relative to the number of female headed households participating in the project. This is one of the areas in which the partners have to revisit their plan and to incorporate gender equity in a practical manner. Another important aspect mentioned by Dr. Mengistu Desalegn is the fact that gender is more than female headed households. A better understanding is needed of the role women play in irrigated agriculture, overall water related activities and to which extent they influence the adoption or disadoption of the technologies. Therefore, the meeting agreed to give more attention to these issues and consider institutions (Ex: Women in male headed households) beyond household heads for the coming year.

6.4 Nutrition

Similar gaps were observed for the nutrition part of the project. In particular for the fodder production (ARARI and SARI), there was no mechanism in place to investigate changes in the milk yield (crop-milk relationship). Additionally, analysis is ongoing regarding the nutrient value of the Napier or Desho grass. Results should be compared against other local grasses as well as their chemical compositions. The animals feeding upon the irrigated forage differ between sites (oxen and dairy cows in Robit whereas only dairy cows in Angacha). Households used Desho and Napier grass to feed oxen and dairy cows however the specific benefit of using the irrigated crops for forage is not fully documented yet. According to SARI, both Desho and Napier grasses are produced to feed only dairy cows, but in Robit-Bata the farmers are feeding other cattle, including oxen the byproducts of wheat and other crops they are producing.
Thus, participants have agreed that there should be mechanism to analyze the nutritional value.

There are also no mechanisms in place to measure impact of the irrigated vegetables and fodder (livestock products) or income generated from the sale these crops and the impact of the crops on household nutrition. The issue will be discussed with IFPRI.

6.5 Income/market

The participants agreed on the significance of better market opportunities in the area. Angacha doesn't have market opportunities for fodder and milk which can discourage investment in the irrigation technology and land allocation for forage. In the fodder-milk-market nexus, most of the cows are hybrids, the farmers don't have protection mechanisms to prevent the perishability of their milk due to the absence of modern storage facilities (refrigerator). Though they prefer to sell the milk, due to market constraints they use it for home consumption. In addition, demand comes with availability, if the farmers can be able to increase the yield, demand will similarly increase. The promising point in this is that there is a plan by ILRI to conduct market assessment around the sites very soon.

Vegetables didn't have a market problem last season as the demand was high in all the sites. In general there was consensus to develop our approach towards market orientation.

6.6 Environmental sustainability

A big component of the ILSSI project is to make sure that the interventions do not cause adverse effects to the environment. As we assess the benefits and costs of the interventions, it's imperative that environment impacts of interventions taking place in each of the sites are evaluated. Referring to the donors' environmental monitoring and mitigation plan, Dr. Petra highlighted in her presentation and also Dr. Simon through skype- the need to conduct environmental sustainable interventions. Particularly, the use of pesticides is an important issue due to multi-use of the shallow wells and rivers. It was emphasized that the project under no circumstances can be involved in any activity that increases the use of agrochemicals. Therefore, all the partners working in the sites under ILSSI project were encouraged to carefully read and follow the environmental monitoring and mitigation plan.

This strong remark was amplified by Dr. Michael who said "Moderate scarce commodity and best use of water should be increased both, bio-physically, economically and sustainably". Therefore, the importance is to look for economically viable mechanisms that improve crop and water management without enhancing use of chemicals.

6.7 Capacity Building

The vital role of training/capacity building in achieving the goals of the project was also underscored during the meeting. The meeting stressed the need to accelerate capacity building of partners. However, some attempts in the framework of capacity building, such as using students should be clearly mentioned. For instance, the partners should identify the types of outcomes they expect from the students in their planning. More importantly, every partner who provided/planned training or capacity building for farmers at grass root, DA`s (development agents) or for other stakeholders at different levels have to fill in the provided excel sheet detailing the training and provide all training materials to the donor.

7 Data Collection, Modeling and Communication

It goes without saying that above all else, high quality data is the indispensable resource that is required to generate quality research output. All those topics discussed above need appropriate data collection and management. The models that help to evaluate and scale up the interventions from field to watershed scale need good quality data as inputs and also good quality data for calibration. Additionally, partners should share success stories at all stages throughout the project. The participants concurred that reliable research outputs depend on the quality of data collected.

Day 2 which was focused on drafting activities for the coming year emphasized responsibilities of the various partners in the various sites. This was aimed at eliminating overlaps in activities among partners in a particular site which created some data collection gaps last year in some sites as the coordination of activities between partners in the site was poor.

The data collection tool, the field book, which was used last year seemed to be unmanageable both to the farmers and the local data collectors. For the coming year, considerations on revising the field book to better capture the needed data will be considered.

Ideas on improving collaboration, communication and data sharing were obtained using an interactive session facilitated by Ewen. The following items and potential solutions were agreed upon by the participants:

- Communication: communication is vital for uptake, thus improve responding to email even a short received notice, if no quick e-mail reaction – send short clarification. Due to limited internet

connectivity in some places, email communication might not be adequate, therefore text messages should be considered if no email reaction has been received. Also use of out-of-office message notifications in order to show that a person is unavailable for a prompt response should be used.

- Data: quality of data and how to follow up with data – what tool to use for the data (quality) management. Planning to include usable tools to capture data

  Suggestions: prepare standardize sheet, collect all data and access guidelines
- Cross-site collaboration- through students
- Develop data sharing guidelines
- Enhance communication towards end users: share and learn about strengths & constraints, using eg. Websites, forum on the wiki-ILSSI and also use your communication channels. An example was given of the Land and Water Resource Centre (LWRC) database that has over 30 years of data that ILSSI can learn from.
- A suggestion for 2 meetings/site/ per year/parallel events to exchange experiences
- Are success stories shared already?
- Publications but also farmer field days, videos and all trainings given should be documented and shared with IWMI and ILRI.
- Data to be centrally managed and accessible upon request
- Documentation: A suggestion was made to provide Cameras for students/partners working on the ground.

Action points:

- Through SMS we can improve the communication mechanism apart from e-mail messages
- Data quality management: Currently they are using the field book but not satisfactorily to generate quality data. The field book needs to be re-evaluated and updated. All agreed to collect the data properly and on time, and to share the data.
- Cross-site perspective is also appreciated and will help, not only by students, but also partners can exchange their experience though this mechanism.
- Desalegne (IWMI communication contact person) can collect success stories from each site to share and disseminate. Participants agreed to provide appropriate information
- Other physical meetings among partners will be possible-- using parallel events. This all partner meeting is expected to continue yearly

- Communication preference including the wiki – Desalegne will liaise with Ewen
- Smart Phones are suggested for field level data collection and sharing in addition to cameras
- Dr. Simon will communicate for the L&WRC data.

8 Synergy Development

The perceived need for collaboration reflects powerful forces for the realization of the project's objectives and it was recommended that these links be further strengthened due to its similar grave concern with data collection. It was acknowledged that there are already established synergies between the partners, but that it needs improvements. There is a great potential in partnership enabling different people and organizations to support each other by leveraging, combining and capitalizing on their complimentary strength and capabilities. The session facilitated by Peter Ballantyne, explored the strengths that can be given by the partners ("THE GIVES") on one hand and their gaps (the support they need-"THE TAKES") on the other hand as well as the mechanisms (HOW) to link the two synergies. Those GIVES and TAKES are documented as follows:

GIVES	How?	TAKES
- Supervision - Produce stories - Information/data - Rainfall/runoff data/watershed - Laboratory facility - Data share - Deliver survey and field report - Advisory service - Graduate students - Knowledge/skills (modeling/WUS) - Data management - Time management/sheet - Backstopping	MOU (TOR/PROTOCOLS) TRAININGS, OWNERSHIP/COMMITMENT STANDARDS/DATA SYSTEMS COMMUNICATION AND ENGAGEMENT CROSS-SITE EXCHANGES/SITE MEETING PEER-EVALUATION	- Data - Need stories - Experience - skill on modeling - Mentoring - Feedback - Water lifting solutions - Publication/publishable results - Applicable output from farm - Technical support

All the aforementioned are important factors, which the workshop discussed and recognized to improve on the way forward. Each partner was able to recognize what the project needed from them and what they can also offer to the project.

9 General Recommendations

Recommendations made included the action points of analyzing nutritional value of fodder interventions, gender equity, identifying appropriate technologies for specific sites, and improving data management and synergies between partners in broader spectrum. Specifically, recommendations for the coming year include:

- The time plans developed by the sites need to be reconciled with the timelines of the project,
- When planning to involve students in the project, it is crucial to identify what outcomes are expected from each student in the project
- The budget should be feasible during the planning
- Site-specific technology adoption and dis-adoption to be researched further
- Data collection, management and communication should be improved and needs to be central. Every partners should record what they are doing and providing evidence is central to research, and to make sure those processes are in place and come through central (to IWMI and ILRI) for centralization, to ensure that common format and template we can use.
- Increasing the number of female farmers' participation should be key in all the sites. Partners need to explore the opportunities and barriers that can to female farmers' involvement in small scale irrigation activities.
- The partners to think about how assess the impact of the interventions on nutrition of the target households.
- It is also important to look at the multiple-use, when providing access to water. What else are farmers are using it for-livestock, domestic use etc.
- Partners should maximize their links and synergies with other projects and institutions, like NGOs, universities and CG systems, mainly with ILRI, in particular with Africa RISING.
- Regarding the fodder development, sites have to look appropriate crops for intercropping with fodder.
- The issues of environmental sustainability and agrochemical use to avoid any initiative which encourage the use of agrochemicals within the domain of ILSSI operates.

10 Concluding remarks

The variety and richness of discussion at the workshop made it possible to draw together in the final discussion all the insights, observations and proposals for action that had emerged during the two days.

Furthermore, the issues discussed and the way forward agreed upon from the meeting justified that the facilitation, the organization and diversity as well as the whole set up of the workshop was essential. The participants actively participated and shared their insights.

One of the interesting outcomes was that in the beginning some participants expected to identify the best technology boosting agricultural development in Ethiopia. However, at the end of the workshop, they unanimously agreed that there is no so called best technology rather it is sites specific. The main issues is that how to identify appropriate technology for specific sites.

To this end, and related reflections, Dr. Petra concluded the two days meeting by appreciating the participants for their valuable insights called and to play a proactive role in addressing the identified key challenges and maximize their commitment to improve the achievements for the coming year. She hoped that the partners were motivated by the discussions from this evaluation meeting to take up the identified activities most related to their expertise, and create a more detailed action plan that fit the main objectives and research questions of the ILSSI project.

Annexes

Annex I: Meeting Agenda

Day 1: August 20, 2015		
Time	**Activity**	**Responsibility/Reporter**
8:00-8:30	Registration	Rahel
8:30-9:00	Project Overview and introduction	Petra
9:00-9:15	Implementation of interventions and research in Robit and Dangla districts	Dr. Seifu Tilahun (BDU)
9:15-9:30	Implementation of Fodder in Robit district	ARARI
9:30-10:00	Reflections (Questions and Answers)	Gebrehaweria and Abera/Prossie
10:00-10:30	Coffee break	
10:30-10:45	Implementation of interventions and research in Lemo/Angacha and Adami-Tulu districts	Dr. Mekonen Ayana
10:45-11:00	Send A Cow/SEDA present on Implementation of technologies, credit management, data collection, outcomes, challenges in Admi-Tulu district	Sofanit/Midekssa
11:00-11:15	Implementation of Fodder in Angacha district	SARI
11:15-11:45	Reflections (Questions and Answers)	Michael Blummel and Prossie/Gebre
11:45-12:30	Cross site learning session and explanation of the afternoon sessions	Petra/Aberra
12:30-2:00	Lunch and poster presentation by PhD students	Debebe Lijalem (BDU), Demelash Wendmeneh (BDU) and Kassaw

		Beshaw (BDU) will present posters for 5 minutes each
2:00-4:00	Group work by site to discuss (see template): · Progress on field implementations · Outcomes · Challenges · Identify gaps in (technology implementation, research, data collection and sharing, credit and saving management, training and capacity building, watershed management, coordination and communication between partners, etc.) · Lessons learned · Planning and way forward	· Group 1: BDU and ARARI (Petra and Aberra) · Group 2: AMU, SARI, Send A Cow/SEDA (Prossie, Michael, Gebre)
4:00-4:15	Coffee break	
4:15-5:30	Groups report back and general discussion...	Prossie and Abera/Gebre
5:30-6:00	Summary and closing remarks	Michael Blummel/Petra
Day 2: August 21, 2015		
08:30-09:00	Revisit and define research questions for year 3: - Short presentation on CGIAR identified gaps - Recap of partner identified gaps	Petra/Michael/Peter B
09:00-10:00	Discussion and prioritization of site-specific research gaps	Peter B
10:00-10:15	Coffee break	Rahel

10:15-12:15	Year 3 Partner specific activity delineation - with emphasis on prioritizing research questions/work based on capacity and resources: BDU & IWMI AMU & IWMI SARI & ILRI ARARI & ILRI	
12:15-13:15	Lunch break	
13:15-14:00	Group work (continued)	
14:00-15:30	Partner presentation / Report back by organisation with dedicated critique: - BDU report by AMU - AMU report by SARI - SARI report by ARARI - ARARI report by BDU	
15:30-16:00	*Coffee break*	
16:00-17:00	Synergies and overlap between partners	
17:00-17:15	Closing session	Michael Blummel

Annex II: Participants List

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