Feed the Future Innovation Laboratory for Small Scale Irrigation

Demand Driven Capacity Development and Stakeholder Engagement

The Innovation Lab on Small-scale Irrigation's (ILSSI) impact pathway leverages **capacity development as a key enabler to achieve positive outcomes** at different levels. The national institutions to use the strengthened skills to manage data and apply research evidence, such as that generated by ILSSI. Small scale irrigation (SSI) has been a neglected means to achieve economic growth and food security, but governments now recognize the need for planning and regulation given the rapid uptake by farmers. ILSSI is adding the capacity to national institutions to assess existing resources and potential outcomes from deploying those under difference scenarios, make evidence-based decisions and formulate policies and programs related to smallholder irrigated agricultural production, such as high potential value chains.

ILSSI's goal is to cultivate individual and institutional skills for continued capacity to carry out research and support decision-making on sustainable intensification, from field research to the Integrated Decision Support System (IDSS) models that will address specific development scenarios or questions related to natural resource management, environment, economics and production systems.

Photo: Group work in Adama during the integration session of SWAT, APEX and FARMSIM model

At farm level, ILSSI provides training and technical support to farmers and stakeholders, such as extension, local government and microfinance organizations. At national level, ILSSI collaborates with university partners to strengthen capacity in research design, data collection, research processes with farmers, household survey instruments and preparation of peer-reviewed publications and presentations. Students, faculty and ILSSI scientists jointly design thesis problems, and collect and analyze field data relevant to sustainable scaling of small scale irrigation. Particularly, ILSSI trains and supports individuals in universities, public institutions and NGOs on the use of field data in the application of the Integrated Decision Support System (IDSS) – a suite of models that can support decision-making for identifying and mitigating constraints to scaling small-scale irrigation.

Demand driven IDSS application in Ethiopia

There is **growing interest in the IDSS in Ethiopia.** This is evidenced by the recent workshop held by ILSSI for the Ethiopian Agricultural Transformation Agency (ATA), the Ministry of Agriculture and Natural Resources (MoANR) and their partners. Demand to learn and apply these tools previously came primarily from academic institutions. Bahir Dar University, Jimma University and Addis Ababa University hosted IDSS trainings for participants from academic, research, and government and private sector institutions. A total of 368 participants attended IDSS trainings (Table 1). The trainees have applied the skills in their respective institutions with support from ILSSI scientists. Now, non-academic institutions are asking ILSSI to provide IDSS training to meet their specific needs.

Table 1. IDSS participants by gender at different hosting Universities Ethiopia

Host	ILRI-Addis	Bahir Dar University	Jimma University-ILRI	Addis Ababa University	ATA-MoANR	Total
Male	69	73	85	48	52	327
Female	9	9	9	11	3	41

ATA tailored IDSS training

The Ethiopian Agricultural Transformation Agency (ATA) officially called for a specially designed IDSS training, signing a Memorandum of Understanding (MoU) in November 2017. It included ATA and the Ethiopian Ministry of Agriculture and Natural Resources (MoANR), as each have key roles in expanding SSI. The MoU aimed to strengthen capacity to apply the IDSS to the ATA's transformational agenda, notably:

1. Identify water resources and their potential for irrigation
2. Promote environmentally- and women-friendly innovations and technologies for irrigation water management
3. Study the environmental impacts of irrigated agricultural land, particularly where there are poor water management practices
4. Contribute to the design and implementation of cost effective drainage systems
5. Support the development of community level watershed management interventions linking socio-economic and environmental benefits

The participants for the training came from different regions, sectors and organizations, such as government agencies, research institutions, universities, and the private sector. ATA and MoANR received positive feedback from participants. They have formally requested to continue and expand the collaboration.

Customized Training Modules with ATA and MoANR: ILSSI's IDSS team collaborated with ATA and MoANR to develop and implement a customized two-week training in December 2017 that included:

- Conventional IDSS (SWAT, APEX and FARMSIM, and their integration)
- Advanced SWAT for calibration, sensitivity and uncertainty analysis
- GIS for Water Resources Management
- AutoCAD for Engineering Design

Key national and independent public enterprises seek capacity to apply IDSS

The Development Bank of Ethiopia (DBE) approached ILSSI after reading the project's paper on [Assessing potential land suitable for surface irrigation using groundwater in Ethiopia](). **DBE views the IDSS as a decision-making mechanism to prioritize their investments related to irrigation expansion in Ethiopia**. As such, DBE sought to generate capacity for their engineers to use the IDSS to improve their decision making. While ILSSI's IDSS team was unable to fulfill the request in the short-term, one DBE staff member attended the ATA-MoANR training.

The Abay (Blue Nile) Basin Authority (ABA), under the Ethiopian Ministry of Water, Irrigation and Energy also participated in IDSS trainings and expressed interest in hosting a training. ABA invited ILSSI to conduct a half-day seminar on the capabilities of the IDSS models in December 2017. ABA wants to use **IDSS tools to assess the available water and land resources in the basin to implement different water resource development projects as well as to identify strategies that reduce soil erosion and ecosystem degradation**. ABA requested IDSS training for:

- Mapping groundwater potential in the Blue Nile Basin
- Determining irrigation system efficiency, including water, land and agricultural inputs
- Assessing economic productivity of irrigation systems and market linkage
- Applying GIS to water management

The Ethiopian Construction Works Design and Supervision Enterprise (ECWDSE), a multidisciplinary engineering firm is another institution that has expressed interest in the IDSS. The ECWDSE requested a special IDSS course following participation in a recent training. ECWDSE sees the potential of **IDSS as a set of tools to improve the efficiency and quality of their project activities**, which would better enable them to address development demands of the country.

Institutionalization of IDSS

One of ILSSI's aims is to strengthen the capacity of the next generation of scientists and professionals who can apply research and analysis methods, including the IDSS, to contribute to the sustainable scaling of small-scale irrigation in Ethiopia. Bahir Dar University (BDU) is a national partner that is institutionalizing the IDSS in its curriculum and research methods. The results were seen in January 2018 at the 2nd Amhara Region Agricultural Forum where BDU graduate students presented work applying the IDSS. Moreover, BDU has adopted the IDSS as an elective course in the Irrigation Engineering and Management MSc program. BDU also aims to set up semi-annual courses for trainers and educators on the IDSS.

Future capacity development toward outcomes

The IDSS trainings have showcased the potential for the use of IDSS in research, analysis and regional and national planning. Initial trainings led to requests from five institutions to receive customized IDSS training. National institutions show a commitment for a continuous and expanded collaboration with ILSSI in the future. ILSSI considers continual engagement and national partnerships the foundation to ensuring relevant research and effective use of results that ultimately contribute to impact and sustained outcomes. Engagement will continue to include activities related to capacity development at different levels, alongside on-going outreach to policy and decision-makers.