



## FEED THE FUTURE INNOVATION LAB FOR SMALL SCALE IRRIGATION: SUCCESS STORIES

### [Applications that will result in changes in practices in the field](#)

#### **Ethiopian Water and Land Resources Center**

The Water and Land Resources Center (WLRC) is using the SWAT model to estimate the water resources at different spatial locations in the basin. The Water and Land Resource Centre was established in 2011 as an institution associated to Addis Ababa University. The WLRC aims to improve the collection, processing, and dissemination of data on hydro-sedimentology, meteorology and land management in order to help informed planning and decision making processes. They are also using the SWAT model to estimate the soil erosion across the subbasin. The overall objective of this project is to estimate the long term soil erosion entering into the Grand Ethiopian Renaissance Dam (GERD). They are also running different best management scenarios that could reduce soil erosion in the basin. The objective of such analysis is to implement watershed management plans that will increase the useful life of GRED. This project is sponsored by the Ethiopian government. The SWAT modeling for this project is led by Dr. Hassen Mohammend (email: [hassenmohammed2008@gmail.com](mailto:hassenmohammed2008@gmail.com))

#### **Abay River Basin Authority**

The Abay River Basin (Upper Blue Nile River Basin) Authority staff has been using the SWAT model for estimating water resources potential in the basin. The Abay River Basin Authority is set up to undertake and facilitate the implementation of an Integrated Water Resource Management (IWRM) in the basin. The staff has been in constant communication with the IDSS team in support of their modeling effort. They are also showing interest to host the next IDSS workshop in Ethiopia to strengthen their modeling capabilities. Habtam Achenef ([habt.ache@yahoo.com](mailto:habt.ache@yahoo.com)), Water Resources Specialist in the River Basin Authority, is in contact with us to coordinate the next IDSS workshop in Ethiopia.

#### **Awash River Basin Authority**

We were informed in the Feb 2017 Ethiopian workshop that Addis Ababa University (AAU) is subcontracted to model the Awash River Basin by the Awash River Basin Authority. The Awash Basin is the most utilized River basin in Ethiopia. AAU prepared soil database for the SWAT model to Awash Basin. Mr. Fitsume Teshome ([bortana20@gmail.com](mailto:bortana20@gmail.com)) is the person in charge from AAU side.



## **Ethiopian Agricultural Transformation Agency (ATA)**

ATA invited us to provide them presentation on capabilities of the IDSS tools and case example applications. They are requested us if we provide them ATA tailored IDSS workshop for their staff and stakeholders. In fact ATA is interested to apply the IDSS tools in their business practices. For example, they are employing a consultant to estimate the groundwater potential in the Lake Tana and Beles sub-basins. The consultant will be using 6 tools and SWAT model is among those. We were discussing how ATA can follow the consultant's work. Mr. Yonas Mulugeta

(email address: [yonas.mulugeta@ata.gov.et](mailto:yonas.mulugeta@ata.gov.et)) requested us if we could support them in reviewing monthly reports from the consultant. We agreed to support them in use of IDSS tools as well as other geospatial and remote sensing analysis.

## **Tanzania Water Partnership (TWP)**

The director for the Tanzania Water Partnership (TWP), Dr. Victor Kongo (email address: [vickongo@gmail.com](mailto:vickongo@gmail.com)), would like to establish regional IDSS workshop in collaboration with the Department of Water Resources Engineering at the University of Dar es Salaam (UDSM). The head of the Water Resources Engineering Department and collaborating partner is Dr. Joel Nobert ([jknobert@gmail.com](mailto:jknobert@gmail.com)). They are requesting us to provide this regional IDSS workshop. They plan to write proposals to WATERnet or any other funding institutions to cover the expenses for this workshop. The University of Dar es Salaam hosts regional MSc program in Water Resources Engineering with support from WATERnet. They discuss that such regional workshop will strengthen the MSc program at UDSM and water resources research in the region.

## **Universities**

There are several Ph.D. and MSc students in most of Ethiopian/Tanzanian/Ghanaian Universities who are using the IDSS tools. They are using these tools to assess the natural resource situations in several of the basins in these countries. These tools are widely applied to study the impact of climate change and land use change as well as assessing the impact of best management practices on soil erosion and nutrient leakage.

## [Advances in the transfer of modeling techniques to national users – both institutional and students](#)

### **On the profitability of irrigated fodder production: comparative evidence from smallholders in Koga irrigation scheme, Ethiopia**

In the article below, Kindie Getnet used SIMETAR program as one of his analytical tools to analyze the profitability of irrigated fodder in Koga- Ethiopia. The study aimed at simulating and analyzing risk in order to inform smallholder farmers, extension agents, researchers and other



decision makers in agribusiness, about the potential benefits/profits of investing in irrigation of fodder compared to traditional irrigated crops.

*Kindie Getnet, Amare Hailelasseie, Yigzaw Dessalegne, Fitsum Hagos, Gebregziabher Gebrehaweria and Berhanu Gebremedhin (2016). On the profitability of irrigated fodder production: comparative evidence from smallholders in Koga irrigation scheme, Ethiopia. Animal Production Science. <http://dx.doi.org/10.1071/AN15651>; Email: [k.getnet@cgiar.org](mailto:k.getnet@cgiar.org)*

## **Reckoning the risks and rewards of fertilizer micro-dosing in a sub-humid farming system in Tanzania**

In the article below, Lutengano Mwinuka used the farm simulation model (FARMSIM) to evaluate the profitability and net return of using fertilizer micro-dosing to grow maize in a Sub-humid farming system in Tanzania. The study's goal is to inform smallholder farmers, extension agents, researchers and other decision makers in agribusiness, about the potential benefits/profits of investing in fertilizer by simulating the economic risk associated with the application of different fertilizer rates.

*Lutengano Mwinuka, Khamaldin Daud Mutabazi, Jeremia Makindara & Stefan Sieber (2016) Reckoning the risks and rewards of fertilizer micro-dosing in a sub-humid farming system in Tanzania, African Journal of Science, Technology, Innovation and Development, 8:5-6, 497-508, DOI: 10.1080/20421338.2016.1257537; Email: [mwinuka.lutengano@gmail.com](mailto:mwinuka.lutengano@gmail.com)*

### **Research and thesis work:**

Andrew Rogers ([niyindagila@yahoo.co.uk](mailto:niyindagila@yahoo.co.uk)), a lecturer in the Department of Policy, Planning and Management at Sokoine University of Agriculture (SUA) will use the FARMSIM model to conduct his research on "Economic Viability of Newly Introduced Tropical Adapted and Improved Chicken Ecotypes at Village Level, Tanzania". He is currently collecting the data and setting-up the model.

Getachew Legese Feye ([abayomiget@yahoo.com](mailto:abayomiget@yahoo.com)) is currently pursuing his PhD in Germany at the University of Bonn and is planning to use the farm simulation model (FARMSIM) to analyze issues related to risk perception and food security.

### **[Potential for using the IDSS for planning at the policy level](#)**

Kadigi Ibrahim ([kideannito@gmail.com](mailto:kideannito@gmail.com)) is a research assistant at Sokoine University of Agriculture. He is planning to use the FARMSIM model in the implementation of the "Scale-N" project (<http://www.scale-n.org>), a collaborative research project between Germany and Tanzania through Sokoine University of Agriculture. The project is funded by the German Federal Ministry of Food and Agriculture (1,381,825 €) for 3 years (2015-2018). The main objective of Scale-N project is to safeguard food and nutrition security for the local population in Tanzania by supporting the development of diversified and sustainable agriculture. The



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

project is implemented in four villages: 2 villages from the Dodoma region and 2 villages from the Morogoro region.

## *Robit youth take up irrigated farming following ILSSI interventions*



*Photo: Gared Tibeb working on his plot at initial tomato growth stage*

The Feed the Future Innovation Laboratory for Small-Scale Irrigation (ILSSI) conducts field interventions in Ethiopia, including in the West Gojam Zone of Bahir Dar woreda at Robit Kebele. The research project is piloting water lifting technologies combined with water management tools and practices. In Robit, the farmers are testing manual

water lifting technologies, and their preferred method is a pulley added to shallow groundwater wells. ILSSI selects

farmers to participate in the field testing based on access to a sustainable water resource and suitable land. The demand to participate in the project has been higher than what project has been able to accommodate. Notably, a number of youth had been unable to join the project because they lacked land. However, after seeing the success of the participating farmers, the youth pursued small scale irrigation on their own initiative. The following provides a brief story of four young farmers that obtained land from their families in order to start small scale irrigated farms.

Gared Tibeb obtained land for the dry season from his father without obligation to pay rent. His father was interested in the farming proposed by his son, so have gave him a 60<sup>2</sup> m plot to test the potential. Gared invested in making his plot productive, such that his father promised to increase the land size for the next irrigation season. Gebre harvested 288kg tomato from his 60m<sup>2</sup> piece of land. He sold the largest portion of the harvest (248kg) to the local market, while the remaining (40kg) was consumed by his family. From the produce sold, Gebre added 1981 ETB (approximate USD 90) to his income.



*Photo: Flowering stage on the plot with Tilahun Abebe's mother*

Tilahun Abebe also obtained a small plot from his father. His 81<sup>2</sup> m plot produced successfully, leading his father to expand the plot size for the next irrigation season. His mother also worked

on the plot with him on agronomic and irrigation activities. Tilahun harvested 212kg, and sold



*Photo: Alene Taye managing his tomato plants*

170kg to the local market, while his family consumed the remaining 42kg. He added 1484 ETB (about USD 67) to his income.

Alene Taye obtained land from his brother. His brother was so pleased with the tomato production that he has also decided to participate in irrigation in the next dry season. Alene harvested 403kg. After selling 353kg of harvested tomato, the remaining 50kg was consumed by his and his brother's families.

He earned 2821 ETB (about USD 127) from the produce sold.

Kassew Amare also obtained the land from his brother under an agreement in which he exchanges the right to use the land in the dry season for sharing the pulley with his brother. After the first season, his brother also decided to take up irrigated farming. Kassew harvested 254kg, sold 227kg and his family consumed the remaining 27kg. He earned 1729 ETB (about USD 78) from the sell in the market.

As this story shows, the youth have high demand for dry season irrigated production. The youth expressed their feelings of the possibilities that would come with expanding their irrigated plots. Through the interventions of ILSSI, people in the Robit community gained interest in adopting small scale irrigation to farm through the dry season. The youth initiative to obtain dry season land use access through family linkages, suggests the potential for expanding small scale irrigated production on family lands that are usually only used for rainy season cropping – the opportunity is open to produce more than



*Photo: Kassew Amare's plot in Robit.*

one crop per year on these lands. The story also points to the demand-driven nature of ILSSI's field level research, as interest for participation is beyond what a research project can support, and interest increases each year of the field interventions. The potential for scaling small scale irrigation technologies and practices is evident, and ILSSI is working with national partners to document and share how to optimize technologies and practices across different areas in Ethiopia.