

Rebuilding Agricultural Extension Services in the Upper Tana Watershed, Kenya

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The agricultural sector in sub-Saharan Africa employs more than [50%](#) of the total labour force and provides a source of livelihood for millions of smallholder farmers. For years, agriculture in Kenya has been influenced by both climatic and anthropogenic factors. The impacts of inadequate rains on agricultural production have been particularly severe due to the predominance of rainfed cropping systems. Climate projections indicate that rainfall variability is likely to increase in the region and further impact food security for the rapidly increasing human population.

In the rural areas of Kenya, these challenges are compounded by inadequate or in-existent extension services to farmers. The lack of public extension services has been identified as one of the impeding factors to agricultural growth in the country. Smallholder farmers not only require services to improve crop productivity but also advice on other development areas like access to markets, value addition, and diversified income generation opportunities.

To counter this, The Nature Conservancy's Upper Tana Nairobi Water Fund (UTNWF) rolled out a partnership program with county governments to support, train and link farmers to agricultural extension services through innovative communication channels. In just 4 years, the project has partnered with the county governments of Laikipia, Nyeri, Murang'a and Nyandarua to support more than 50,000 smallholder farmers. Each county government has seconded a full-time county extension officer to the project. The project has further recruited 15 youths as technology promoters to support farmers in the implementation of sustainable technologies for rainwater harvesting and irrigation.

By June 2021, more than 44,000 farmers are implementing sustainable land management measures in the Upper Tana River watershed leading to clean water supply for millions of water users downstream. The watershed supplies more than 95% of drinking water to Nairobi residents, hospitals, schools, and industries. Sustainable management of the water sources, by working with all stakeholder, is not only crucial for the environment but also the social and economic development of the country.



Photo 1: A farmer by her 50,000 liters water pan for growing vegetables in Nyeri County © Roshni Lodhia/TNC

To increase the number of farmers reached through the extension services, the UTNWF developed a mobile phone SMS platform that provides for two-way communication between individual farmers and extension officers. The platform conveys conservation messages, weather information, and where to access farm inputs for the farmers. The platform has more than 44,000 registered farmers who benefit from the extension services.

Farmers have learnt much from the extension officers and now share the same information and knowledge to others in the community. [Irene Mumiria](#), a smallholder farmer in Murang'a county, used to get low crop yields from her farm due to declining soil fertility as a result of erosion and unpredictable rainfall pattern in the region. The UTNWF showed her how to harvest rainwater in water pans and prevent soil erosion through the construction of terraces and grass strips.

“I wasn't seeing any profits on my farm because of water shortage and had to rely on the rainy seasons. With help from UTNWF, I have a lot of water harvested in the water pans. Now I don't lack food and money in my pocket”, says Irene.

Observing the positive changes in her farm, the local farmers frequently visit her farm to learn the interventions that she has implemented. Most farmers in the area have adopted rainwater harvesting technologies and are applying measures to prevent soil and nutrient loss from their lands.

Similar results have been observed in India, a country that is not only able to feed its more than 1.28 billion people but is also a net exporter of agricultural commodities like rice. This success is

attributed to the public-private partnership and the use of information and communication technology.

In Nyandarua County, Peter Njoroge used to earn less than KES 20,000 from his two-acre farm before the advent of UTNWF's extension services initiative. He was among the first farmers who were trained on rainwater harvesting, agroforestry, and terracing to control soil and nutrient loss from his land. Through the training he received, he excavated a 50,000 liters water pan that he uses to irrigate his 4,000 tree tomato plants during the dry seasons. Every week, he harvests 1,000 kilograms of tree



Photo 2: Peter Njoroge(left) receiving advice from UTNWF extension officer at his tree nursery in Nyandarua county © John Mburu/UTNWF

tomatoes and sells them at KES 100 per kilogram. Mr. Njoroge has also established a tree nursery and sells more than 5,000 tree seedlings at KES 250,000 in two rain seasons. He now earns over KES 400,000 (USD 4,000) from the proceeds of his farm.

The extension services aim to provide a win-win partnership with the users of the environmental services. For instance, through the excavation of terraces, water pans, and planting of grass strips, downstream water users benefit from clean water and savings on the cost of raw water treatment. The turbidity of water for major rivers in the watershed has been observed to decline by up to 33%. On the other hand, Mr. Njoroge has enough fodder for his cattle from his 300 meters of grass strips. He says that his two cows have increased milk production from 12 liters to 50 liters in a day.

As a result of the success of such partnerships with farmers and water users, cities like Eldoret and Mombasa are in the process of developing similar models to protect and conserve their water sources. The public and private sectors should be on the frontline to fund extension services that contribute to improving community livelihoods and ensure the sustainability of ecosystem services.