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# Strengthening sorghum and millet value chains for food, nutritional and income security in arid and semi-arid lands of Kenya and United Republic of Tanzania (SOMNI)

Sorghum, finger millet and pearl millet are the most important staple foods for most households in the semi-arid tropics of East Africa since these crops grow in harsh environments where other crops do not grow well. They are the primary sources of energy, protein, vitamins and micronutrients for people, and provide feed and fodder for livestock as well.

## QUICK FACTS

**PROJECT** Strengthening sorghum and millet value chains for food, nutritional and income security in arid and semi-arid lands of Kenya and United Republic of Tanzania (SOMNI)

**FOCUS COUNTRIES** Kenya and United Republic of Tanzania

**LEAD IMPLEMENTING INSTITUTION** International Crops Research Institute for Semi-Arid Tropics (ICRISAT)

**IMPLEMENTING PARTNERS** Africa Harvest Biotech Foundation International Kenya Agricultural & Livestock Research Organization Tanzania Agricultural Research Institute Sokoine University of Agriculture

**GOAL** Improve food, nutritional and income security for enhanced livelihoods and gender equity among smallholder farming households in the semi-arid lands of Kenya and United Republic of Tanzania

**BENEFICIARIES** Resource constrained smallholder farmers and agro-pastoralists, rural grain traders and aggregators, cottage and village grain millers, other value addition small and medium-sized enterprises (SMEs), and local schools

**DATES** 2011-2020

**FINANCING** EUR 3.0 million

Sorghum, finger millet and pearl millet are more resilient and better adapted to the challenges of climate change, low soil fertility and limited moisture levels of the arid and semi-arid (ASAL) regions. Despite their nutritional value, demand for these grains is limited because they are used for a narrow range of food and value-added products for household consumption and mass markets. If used in combination with dryland legumes (such as cowpea, pigeonpea and green gram), however, they can significantly contribute to enhancing household food and nutrition security.

Investments in improving the production, availability, storage, utilization and consumption of these food crops contribute to the household food, nutrition and income security of ASAL communities. SOMNI was designed to build on the successes of an earlier project – Development of a robust commercially sustainable sorghum for multiple uses (SMU) value chain in Kenya and United Republic of Tanzania.

## SOMNI project objectives

The project focused on the following objectives:

- Conducting rapid assessment studies to establish status of nutrition and production and identify gaps along the sorghum, finger and pearl millet value chains;
- Evaluating released and elite cultivars for grain nutritional qualities and promoting adoption of improved sorghum, finger and pearl millet varieties among food-insecure communities;
- Adapting and scaling up robust, commercially sustainable sorghum, finger millet and pearl millet value chains by mapping out these value chains and needs gaps; developing strategies to fill gaps; forming value chain platforms for governance and development;
- Diversifying utilization of sorghum, finger millet and pearl millet at the household and market level for nutritional and income enhancement; and
- Strengthening the capacity of sorghum, finger and pearl millet value chain stakeholders for improved production.

## Achievements

High-yielding cultivars of sorghum, finger millet and pearl millet with resistance to key biotic and abiotic stresses were tested in target production agroecologies across the two countries. Participatory selection for the promotion and release of varieties involved all stakeholders along the crop value chains. Selected

lines were entered into national performance trials and several were released for commercialization. The selected varieties were tested for consumer acceptability for various end uses at the household (food) and industrial (food, feed and malting) levels. Seed production and delivery mechanisms were put in place through community seed producers for QDS and private seed companies for certified seed.

The project has directly reached more than 100,000 households in Kenya and United Republic of Tanzania and so far has achieved the following:

- Released 14 sorghum and 6 finger millet varieties containing market-specific qualities in human food, animal feed and malting end uses in Kenya and United Republic of Tanzania;
- Entered 10 sorghum and 8 finger millet varieties in national performance trials across the two countries in 2019;
- Trained over 90,000 farmers in Good Agronomic Practices (GAPs) seed production and post-harvest handling, and 166 women's groups in value addition. Distributed over 730 tons of sorghum, finger millet, pearl millet, green gram, cowpea and groundnut seed of different classes to beneficiary farmers;
- Supplied 37 fabricated mechanical threshers to the project areas for use by farmers to ease the workload, especially for women, and improve grain quality;
- Supplied 47 charcoal-based ovens to women's groups for use in baking sorghum, millet and products;
- Developed, validated and promoted 12 sorghum, finger millet and pearl millet products (e.g. cakes, biscuits, pop sorghum, porridges, chapati, mandazi, noodles, wine, poultry/fish feeds)
- Reached 31 schools with nutrition messages and sorghum/millet-based recipes. School feeding programmes designed in collaboration with the ICRISAT Smart Food initiative to improve the nutritional status of schoolchildren in 8 schools have adopted the use of products based on sorghum, finger and pearl millet in their feeding programmes
- Developed innovative and diverse sorghum, finger millet and pearl millet recipes for households and markets, which has led to a 60 per cent increase in home consumption with significant potential for product commercialization;
- Promoted use of inclusive business model aggregator model in addressing (improving, setting up, implementing, etc.) services both downstream (inputs access, mechanization, land preparation and threshing) and upstream (aggregating

### Enhanced market access through collective efforts

“I am the chairperson of Kiagu CBO, which was formed in 2018 through facilitation by the SOMNI project. It has a membership of 33 drawn from Kiagu Ward, Meru County, in Eastern Kenya. Unregistered farmers are also allowed to access some services from the CBO. The objective of the CBO is to look for better markets for our produce because farmers have really suffered from lack of markets and poor prices from brokers”, says Jacob.

“The project educated us on how to form groups and how to grow sorghum. The team, through our agricultural officer, helped us with marketing of our sorghum grain by linking us with the Cereal Growers Association. Through the Association, we found a buyer for our sorghum grain.”

“We have succeeded in cutting out the brokers, who would buy sorghum at the low price of 22 Kenyan shillings per kilogram. Last season (Jan/Feb 2020), the CBO bought sorghum grain from farmers at 29 shillings per kilogram and sold to the buyer at 30 shillings. The 1 Kenyan shilling per kilogram is profit for the CBO. It is used to facilitate the transport of grain from farmers and facilitate the day-to-day running of the CBO.”

marketable volumes). Over 40,000 farmers benefit from input access and/or market and information access through the model. For example, Sorghum Pioneer Agencies in Kenya, one of the first aggregators identified and supported during the SMU and SOMNI projects, provides services to approximately 15,000 smallholder farmers;

- SMU was selected as one of the most successful EC/IFAD-funded projects and was visited by the EC and IFAD Directors and Team for Sustainable Development in the EC in 2015;
- The SMU project was also selected for filming as an EC/IFAD-funded success project in 2015;
- A book of recipes made with locally produced sorghum, finger millet, pearl millet and pigeonpea was developed and is now being promoted;
- The SMU and SOMNI projects won two ICRISAT Outstanding Partnership Awards for the Eastern and Southern Africa Program in 2014 and 2019;
- Mutiat Bolanle Titilola, a student participating in the IFAD-Universities Win-Win Partnership project undertook a survey on the contribution of the SMU project. She established that it was effective in improving the food security and incomes of smallholder farmers in the project areas
- Beatrice Nkatha, Founder and Managing Director of Sorghum Pioneer Agencies, one of the aggregators in Kenya, was invited to share her experience working with smallholder sorghum farmers at IFAD’s 39th Governing Council in 2016, in recognition of the private sector partnerships forged during the SMU project; and
- A youth group in Homabay Kenya is integrating sorghum, poultry and aquaculture ventures and providing young people with the opportunity to create employment and improve incomes.

### From research results to impact

By Following the various project interventions, the farmers’ sorghum yields have increased from 0.8 t/ha (8.8/90kg bags i.e. 8.8 bags each weighing 90 kg. Farmers pack grain in bags which have a standard weight of 90 kg) to 2.0 t/ha (22.2/90kgs bags); finger millet from 0.6 t/ha (6.7/ 90kg bags) to 1.7 t/ha (18.9/90kg bags); and pearl millet 0.5 t/ha (5.6/90kg bags) to 16.7/90kg bags). Better market linkages have led to an increase in farm incomes of about 30 per cent. For instance, in Kenya, 6,439 farmers who were reached with project services, such as seed distribution and GAPs training, produced 456,310 kg of the project crops (sorghum, pearl millet, finger millet, cowpea, green gram and ground nut) during the 2018/2019 project year. The produce was valued at approximately Kenyan shillings 25,581,590 (US\$255,816) and about 60 per cent of this was sold as surplus to generate income to meet household needs such as school fees, medical expenses, and the purchase of other assets.

### Innovations

**The project has made a significant contribution to the development of new varieties and hybrids which tolerate drought conditions, insect pests and diseases, have consumer preferred traits and can be put to multiple uses. These varieties offer farmers in ASALs a chance to have food and nutrition security, particularly in the face of climate change. The release of an improved “snapping” finger millet variety is a key milestone in reducing labour costs at harvesting and will ease the burden on women farmers and children.**

The project also used the aggregator model, which is a novel idea with potential for impact across the board.



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#### CONTACTS

##### Malu Ndavi

Lead technical specialist  
Strategy and Knowledge  
Department, IFAD

Tel: +39 06 5459 2766  
Email: m.ndavi@ifad.org

##### Henry Ojulong

Senior Scientist  
Crop Improvement,  
ICRISAT-Nairobi

Tel: +254 722 4550  
Email: h.ojulong@cgiar.org



Investing in rural people

International Fund for  
Agricultural Development  
Via Paolo di Dono, 44  
00142 Rome, Italy  
Tel: +39 06 54591  
Fax: +39 06 5043463  
Email: ifad@ifad.org  
www.ifad.org

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The model enhanced integration of farmers in rural areas into a commercial value chain while accessing critical inputs and improved technologies, from research, in a cost-friendly and sustainable manner.

Commercialization of poultry and fish feed produced using locally grown raw materials that include sorghum, finger millet, pearl millet, soya and similar grains is an excellent innovation in terms of the development of cottage industries and processing, youth employment and integration into agriculture, enhanced incomes, poverty reduction and overall rural economic development.

### Future directions

The SOMNI project has demonstrated the value of partnerships and the “whole value chain” approach in delivering technologies. The partnership model established can be replicated in future technology transfer initiatives involving CGIAR, national agricultural systems (NARS), NGOs and the private sector. Key takeaways for the coming years include:

- Scale up and out successful interventions to areas in similar agroecologies not reached by the project;
- Enhance the capacity of private seed companies with an interest in sorghum hybrids, through the Eastern and Southern Hybrid Parents Research Consortium for sorghum and millets;
- Support the development of alternative end-user markets for sorghum, finger and pearl millet, including through government flour-blending policies;
- Promote youth enterprise using some of the technologies and approaches implemented, such as threshing services and grain aggregation; and
- Develop the value chains integration component through the use of sorghum, finger millet and pearl millet in other value chains, such as poultry.