

FoodAfrica

Results booklet

# FoodAfrica

*Improving Food Security in West and East Africa*



Ministry for Foreign  
Affairs of Finland

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## **Agricultural research for development**

Investing in agricultural research in developing countries is one of the most cost effective ways to increase sustainable food production.

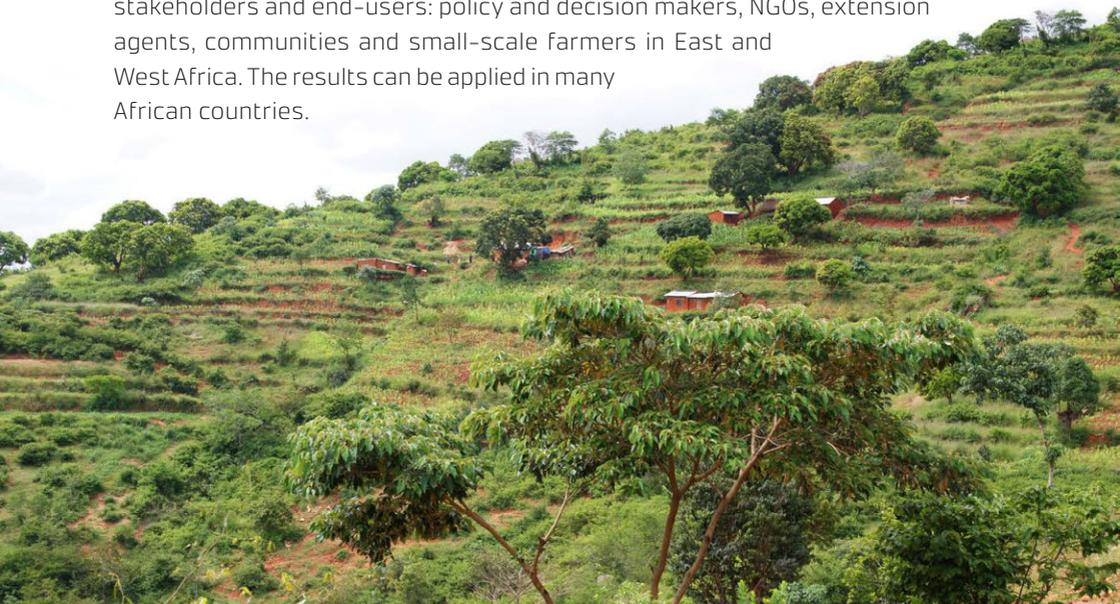
Research-based knowledge provides methods for increasing food production and improving food safety, diets, and market access.

Improving the productivity of the agricultural sector has potential for significant economic development and enhanced well-being of people.

## **Capacity building**

Since 2012, FoodAfrica has helped to build human capacity at various levels. It has strengthened cooperation and knowledge transfer between African, Finnish and CGIAR experts and institutions.

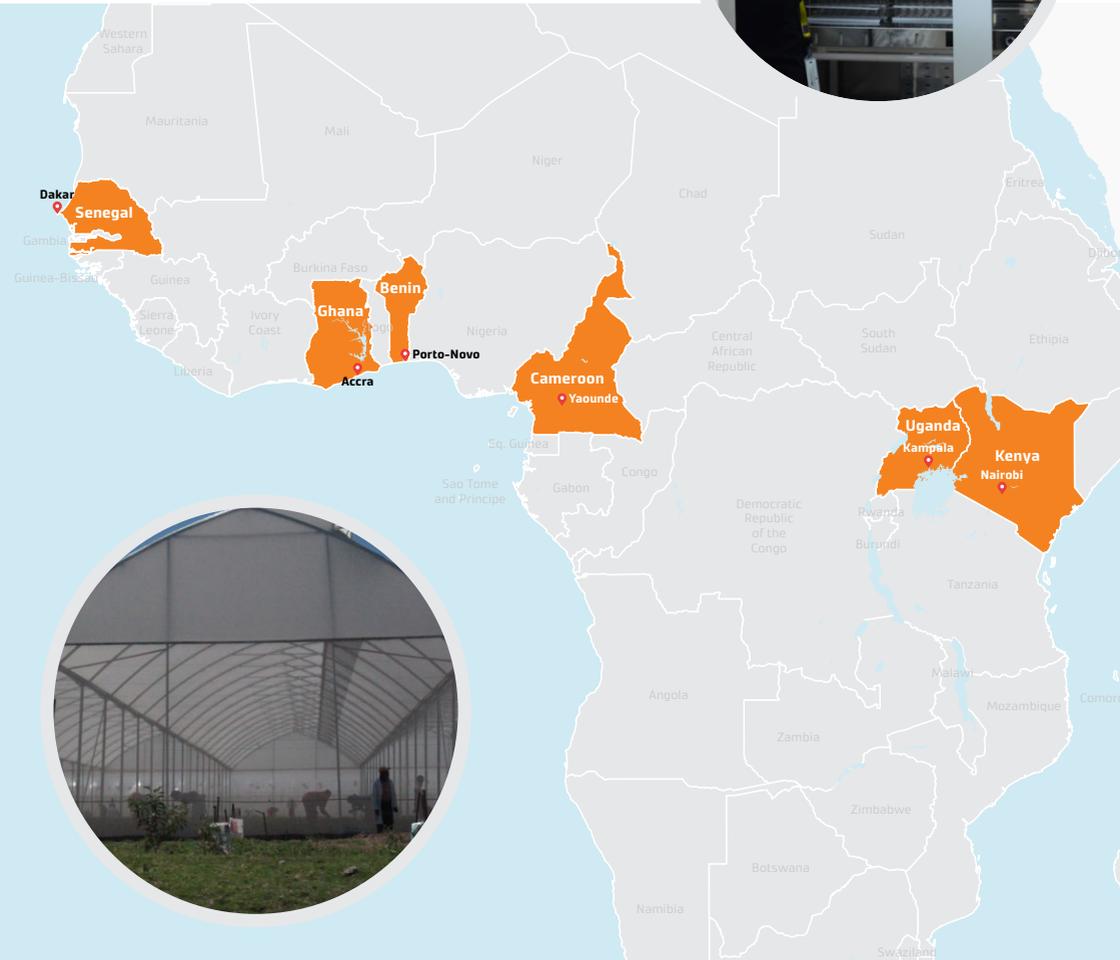
During the past year, the research results have been disseminated further to stakeholders and end-users: policy and decision makers, NGOs, extension agents, communities and small-scale farmers in East and West Africa. The results can be applied in many African countries.



# Research areas

The work was done within three thematic components that concentrated on specific research areas:

- Sustainable Food Production
- Food Safety and Nutrition
- Market Access and Extension



## Poor soils, serious consequences

Soil micronutrients are essential to plants, animals and humans. Lack of these elements can retard growth and cause severe health problems. Overcoming micronutrient deficiencies in soils tackles the root of the problem and has potential to provide a robust and sustainable solution to human micronutrient deficiencies.

A portable x-ray fluorescence spectroscopy (pXRF) developed within the programme continues to be a breakthrough technology for direct measurement of macro and micro nutrients in plant materials and soils. Analysis of the samples showed that Africa topsoils lack manganese (8%), iron (42%), copper (48%), zink (56%), and boron (79%). Also other rapid, low cost analytical methods and tools were developed.

## *Africa topsoils lack manganese, iron, copper, zink, and boron.*



Furthermore, we extended the soil properties maps of Africa to include macro and micro nutrients. They are the first available maps of micronutrients at continental level and provide a guide for regional and national planning of fertilizer imports, blending, supply, and recommendations to farmers.

During 2017, we worked hard to disseminate the research results to end-users - the farmers - as well as policy-makers to turn the knowledge into everyday working practises.

## 8-fold differences in dairy cattle keeping households

There are up to 8-fold differences in profit to Senegalese dairy cattle keeping households, depending on which breed or cross-breed of cattle is kept, and the livestock management practices utilized.

### *Cross-breeding and better cattle management improved farmers' income remarkably.*

In our research, the highest household profit was obtained by keeping crosses of the traditional Indigenous Zebu with newly introduced Bos Taurus, under good management conditions. This increase in profit was largely driven by higher milk-offtake.

Critical factors for dairy cattle keepers to optimally increase their income:

- the availability and accessibility of *cross-bred semen*, via public and/or private sectors;
- access to *credit* to support initial investment;
- *capacity building* on management of the cross-bred dairy cattle;
- *strengthened access to inputs*, particularly feed, and markets

FoodAfrica has produced a lot of dissemination material and established new collaborations with key organizations to ensure the knowledge been transported to farmers. This includes promoting gender equality, as the control of income from the sold milk will likely shift from women to men when the amounts increase.



## Climate change effects on food security in Senegal

In the face of climate change, the environment becomes drier on the coastal area of Niayes in Senegal, and the availability of irrigation water decreases.

As a result, legume and vegetable production is estimated to decrease, by up to 33% for carrot and 21% for potato. These are water-intensive crops. Our analyses show decreases in yield and cultivated area of peanut, maize, millet, sorghum and rainfed rice as well.

## *Production model simulations showed yield decrease in several crops due to climate change.*

The groundwater resource stock, however, is being over-drawn and needs better management to maintain its sustainability. In 2017, challenges and solutions related to the use of water resources were communicated with the stakeholders. Different approaches, including the interactive theatre forum method, were used.

Options for producers include:

- Better management of soil moisture and rainwater harvest techniques to optimize the use of resources available
- Changing crops – either towards more resilient ones, or towards more profitable ones - to justify the cost of irrigation where this might be possible.



## Wild foods help to reach food and nutrition security

146 different edible plant and 148 edible animal species were documented in the project area in Benin, showing the richness of local biodiversity for food and nutrition. Due to lack of knowledge, this valuable is underutilised, and 80% of surveyed households experienced some form of food insecurity over the past month, and 59% of households lacked foods several times across the year.

## *A recipe book and a food calendar were created to promote use of wild foods.*

Wild foods provide important contributions to food and nutrition security and resilience, particularly during months of staple food scarcity. Adequacy of micronutrients from the diet correlated with caregivers education, indicating a great potential of nutrition education adapted to local context.

To increase awareness and use of wild foods, FoodAfrica has created an advanced recipe book using linear programming and field testing. In addition, a food calendar presenting all local foods available over the different seasons along with simple training videos were developed.



## Preventing hidden poison

Aflatoxins are common in crops and milk in Kenya. In low-income areas of Nairobi aflatoxin M1 could be detected in 100% of milk samples and an association with stunting was found.

Traditional fermenting methods, using indigenous strains of lactic acid bacteria, can inhibit growth of some molds and can bind aflatoxin produced by the fungi.

## *New methods reduced aflatoxins in crops by 80%.*

Mobile dryer, combined with tarp drying, reduce aflatoxins by 80%, and almost 70% of farmers to whom the drying service was offered free of charge used it. Fewer were willing to pay as the cost increased, but farmers were more likely to pay if they received a premium price for safe maize.



Our research identified several mitigation strategies, but also indicated that adoption of these is likely to be highly dependent on their cost. Market-based solutions will likely have little impact on subsistence farmers, for whom other strategies should be developed.

Lactic acid bacteria (LAC) may provide a useful biocontrol method to reduce exposure to aflatoxins from contaminated cereal and dairy products. FoodAfrica's work on the method is in progress.

# Market Access and Extension



## **SMS services help farmers negotiate better prices**

A large majority of farmers own mobile phones, but do not feel well-informed about agricultural markets. Only few farmers use their phones to get market information.

***Up to 80% of the farmers found market info delivered via SMS messages very useful.***

We explored how African farmers could profit from information about crop prices, production methods, and weather, delivered via SMS messages.

60-80% of farmers found the market info “very useful”, as they were able to negotiate better prices and decide when to sell. On the other hand, illiteracy and small sales reduced the interest. Production and weather information were highly appreciated. In 2017 and 2018, FoodAfrica continued to train local farmers on how to get, analyse and use market information.

Projects and non-governmental organizations can help farmers by providing SMS-based information services, particularly for farmers growing perishable crops like fruits and vegetables. Mobile service providers may wish to bundle these services with their wireless services to gain competitive advantage.



# Market Access and Extension



## Volunteer farmer trainers are effective

Farming is becoming more knowledge-intensive, yet there isn't much extension staff in sub-Saharan Africa. FoodAfrica's Volunteer Farmer Trainer programs helps organizations reach more farmers and encourage farmers to learn from each other. On average, a volunteer trains over 50 farmers.



**85 organisations have already adopted the volunteer farmer trainer programme.**

Volunteer farmer training empowers women and improves their access to extension. Organizations are able to achieve a 30 percent higher proportion of women among farmer trainers than among their extension staff. But proactive measures are needed for recruiting female farmer trainers, such as targeting women's groups.



The main reasons farmers become trainers are access to knowledge and altruism. Extension providers can make their volunteer farmer trainer programs more effective and sustainable by providing low-cost incentives such as badges, certificates, community recognition and field tours. In February 2018, the number of organisations adopting the volunteer farmer trainer approach has reached 85.

To promote the benefits of volunteer farmer training, FoodAfrica has produced a chapter on the topic to be published in a book *The Climate Smart Agriculture Papers: Investigating the Business of a Productive, Resilient and Low Emission Future*.



# FoodAfrica programme ends – but the work continues



FoodAfrica has developed new knowledge and tools for increasing productivity, improving food security and livelihoods of small-scale farmers and vulnerable groups and reducing absolute poverty in Africa.

Based on the results of FoodAfrica targeted research activities, capacity building of local agricultural stakeholders at different levels has been done throughout the programme. We are confident that the local experts will make use of their expertise and continue to develop the work further as FoodAfrica programme ends.

***FoodAfrica has reached over 10,000 farmers, produced over 300 publications and training materials, and trained 16 PhD and 15 MSc students.***



The second phase of the FoodAfrica programme will end in June 2018, but, despite improvements, there is still a lot to do to reach the Zero Hunger goal in East and West Africa. Let's continue the work together!





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