

**Results booklet**

FoodAfrica



# FoodAfrica

*Improving Food Security in West and East Africa*



## **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 can lead to significant economic development and enhanced well-being of people.

## **Human capacity building**

FoodAfrica contributes to building human capacity at various levels. It strengthens cooperation and knowledge transfer between African, Finnish and CGIAR experts and institutions.

The research results will be 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

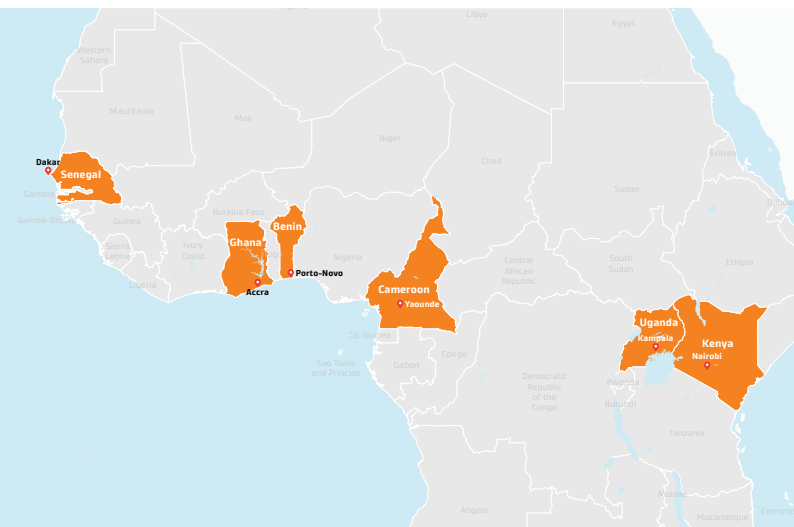
FoodAfrica



FoodAfrica is a research for development programme improving food and nutrition security in East and West Africa. It supports capacity building and provides new knowledge and tools for researchers, decision-makers, NGO's and local farmers to improve local food security. FoodAfrica Programme has been running since 2012 and continues until 2018.

The work is done within three thematic components that concentrate 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 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.

We developed rapid, low cost analytical methods and tools for diagnosing soil and plant micronutrient deficiencies and analysed 1,900 reference samples from the Africa Soil Information Service baseline. Africa topsoils lack manganese (8%), iron (42%), copper (48%), zinc (56%), and boron (79%).

We need to develop fertilizer blend recommendations that address deficiencies that hinder African smallholder farmers' crop and livestock productivity. We also need to support the capabilities of fertilizer producers to achieve more targeted and appropriate fertilizers for different regions.

We are also exploring regional options for stabilising micronutrient deficiencies using organic resources such as manures, composts, urban waste, as well as lowering the likelihood of imbalances and toxic effects.



## 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 utilised.

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:

- 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

As households sell more milk, the control of income from the sale of milk starts to shift from women to men. Thus gender transformative approaches may be required for fair benefit to all household members.





## 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 will decrease, by up to 33% for carrot and 21% for potato. Our farm production model simulations show yield decreases also for peanut, maize, millet, sorghum and rainfed rice, as well as decreases in fertile area.

The groundwater resource stock however, is being over-drawn and needs better management to maintain its sustainability.

Options for producers include:

- Better management of soil moisture and rainwater harvest techniques to optimize what's 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.

However, 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.

Coping strategies used during food insecure periods include reducing diversity and quantity of food, taking loans to buy food or consuming wild foods, particularly wild vegetables.

60% of the children surveyed met the minimum dietary diversity. However, none of the children surveyed reached the recommended nutrient intake. The diets are not sufficient to provide the necessary nutrients intake for calcium, iron and zinc.

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.



## Preventing the 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.

Mobile driers, 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 identifies several mitigation strategies, but also indicates 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 may provide a useful biocontrol method to reduce exposure to aflatoxins from contaminated cereal and dairy products.





# Market Access and Extension



## SMS services help farmers negotiate better prices

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

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.

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.

A blackboard-style display for "Infotrade Agricultural Market Information Services". The board is divided into two main sections: "Buying" and "Selling". Each section has a table with columns for "Item / Crop", "Quantity", and "Telephone No.". The "Selling" section contains handwritten entries for various agricultural products and their corresponding phone numbers. A potted plant is visible to the right of the board.

Buying			Selling		
Item / Crop	Quantity	Telephone No.	Item / Crop	Quantity	Telephone No.
			BRAILERS	2 KGS	0751 839020
			KROHLERS	1	0701 956443
			DOER GOATS	1	0200 906444
			MAIZE GRIN	20 b...	0754 323839
			PIG LETS		0200 906444
			IN ALF HEITER		0200 906444
			DORGHUMMANS		0754 323839

# Market Access and Extension



## Volunteer farmer trainers are effective

Farming is becoming more knowledge-intensive, yet extension staff are few. Volunteer Farmer Trainer programs help organizations reach more farmers and encourage farmers to learn from each other.

Each volunteer farmer trainer trained an average of 54 farmers. Women trained as many farmers as men though within a smaller area.

Volunteer farmer training empowers women and improves their access to extension. Organizations are able to recruit 30 more 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.

Access to knowledge and altruism were the main reasons farmers become farmer trainers. 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.



# FoodAfrica work continues



FoodAfrica develops 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.

We aim to achieve this through capacity building of local agricultural stakeholders at different levels and dissemination of results derived from targeted research activities.

We will focus on customizing our research results for different end-users and disseminating them widely to stakeholders, including higher education institutions, extension organizations, NGOs, policy makers and farmers.





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