### Agriculture and Dietary Diversity in Africa (ADDA)

<table>
<thead>
<tr>
<th>Project status and donor</th>
<th>Ongoing project, funded by the Federal Ministry of Food and Agriculture, Germany.</th>
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<tr>
<td>Goal</td>
<td>Improve knowledge on link between agriculture and nutrition in the African small farm sector. Also, develop approaches for uptake of pro-nutrition innovations.</td>
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| Project duration and countries | 36 months; January 2015 to December 2017  
Ethiopia, Malawi, Uganda and Kenya (Africa Harvest only involved in Kenya) |
| Theory of change/approach | Using a randomized controlled trial (RCT) to study the nutritional linkages in the African small holder farm sector and develop approaches on how the uptake of pro-nutrition innovations can be promoted. |
| Partners and Collaborators | • Georg-August - University of Gottingen, Department of Agricultural Economics and Rural Development  
• The University of Nairobi, Department of Agricultural Economics  
• Kisii and Nyamira county governments in Kenya: Departments of Agriculture, Livestock and Fisheries |
| Progress                 | • Inception and planning workshops, baseline survey and ToT completed.  
• Agreement reached with Guruvet Company Limited (supply day-old chicks) and KALRO Kakamega (to provide KK 15 bean seeds).  
• Training protocols and data capture tools developed and deployed.  
• Mid-term review and planning workshop for next phase completed. |
| Challenges and lessons learnt | • Group dynamics: Disagreements among group members, sampled group members moving out.  
• Dealing with 12 control groups that are exposed to trainings and innovations (but do not receive any of the technologies).  
• Good and timely strategic communication is critical to success. |

In the second season (September to December 2016), he increased the area under beans to two acres of bean seed multiplication. He harvested 1,001 kg before sorting and 900 kg after sorting. On average both seasons produces 440.3 kg/acre of bean seeds with a value of TZS 1,100,750.

**Knowledge flow influence on farmers’ adoption of pro-nutrition and agricultural technologies**

Close to one billion people worldwide are undernourished, while many more suffer from deficiencies in specific nutrients, such as essential amino acids, vitamins, and minerals – mostly as a result of meagre and low-quality diets.

In developing countries, under-nutrition and micronutrient malnutrition are still the leading
causes for infectious diseases, premature death and impaired physical and cognitive development. Women and children are the most affected population groups, especially in Africa, where the majority of the malnourished people live in rural areas, mostly in smallholder farm households.

The agricultural sector is therefore one of the key entry points to improve nutrition and health. Beyond increasing calorie consumption, agriculture can be the vehicle to broaden and improve quality of diets. However, the challenge remains: How can farmers effectively access and utilize appropriate innovations in agriculture?

The ADDA study project is being implemented in several African countries. In Kenya, the study project location is Kisii and Nyamira counties. Africa Harvest is partnering with a German and Kenyan university: the Georg-August-University of Göttingen’s Department of Agricultural Economics and Rural Development and the University of Nairobi’s Department of Agricultural Economics.

Other partners include the Ministry of Agriculture, Livestock and Fisheries in Kisii and Nyamira counties, KALRO Kakamega and Guruvet Kenya Limited, a private company that specializes in consultancy, research, training and supply of agribusiness innovations and products.

The overall aim of the ADDA project is to improve the knowledge on agriculture-nutrition linkages in the African small farm sector and develop approaches to how the uptake of pro-nutrition innovations can be promoted.

The project has two objectives. First, to better understand the relationship between agricultural production diversity and nutritional quality, as well as factors that influence this relationship. This will help identify agricultural diversification strategies.
(pro-nutrition innovations) well adapted to these particular settings. This objective is being pursued by analyzing existing representative household data from four countries in eastern and southern Africa, namely Ethiopia, Kenya, Malawi and Uganda. This data is publicly available from the Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS – ISA).

The second objective is to develop and test new models of community outreach that are suitable to promote the uptake of pro-nutrition innovations in a sustainable and gender-equitable way. This objective was pursued through RCTs carried out in Kisii and Nyamira counties, Kenya. In this location, pro-nutrition innovations were identified as an ideal intervention.

**Project implementation strategy**

To improve nutrition, identified pro-nutrition innovations were implemented in farmers’ fields. Successful implementations of pro-nutrition innovations involved effective community outreach. The project also examined how information and communication technologies (ICTs) can be employed to increase cost-effectiveness.

The project employed RCTs. Different types of outreach models (“treatments”) were designed and implemented in randomly selected groups. These
treatments were evaluated and compared in terms of their effectiveness in spurring innovation uptake and impacts on female empowerment and nutrition outcomes. This allowed the project to identify the most cost-effective and gender-equitable models of community outreach for pro-nutrition innovations. The project also analyzed the role of social networks; a good understanding of local information flows can help to better utilize indigenous knowledge and improve the success of nutrition awareness creation.

The ADDA baseline survey

A baseline survey was done in the target regions – Kisii and Nyamira counties – when the project started. Baseline surveys are an important part of the M&E process. The Food and Agricultural Organization (FAO) defines a baseline study as: "a descriptive cross-sectional survey that mostly provides quantitative information on the current status of a particular situation – on whatever study topic – in a given population. It aims at quantifying the distribution of certain variables in a study population at one point in time”.

The goal of the baseline survey, therefore, was to ensure that any possible impact of the ADDA study was captured; an accurate picture of the initial status of the target regions is critical in achieving this. The baseline survey also conformed to the global best practice.
ADDA Project Manager Antony Aseta of Africa Harvest training participants in ADDA ToT workshop in Kisii County.

Andrea Fongar of University of Gottingen training participants in ADDA ToT workshop in Kisii County.
Richard Nyang’au, a field officer in Nyamira County, training a farmer group under the ADDA project.

ADDA project partners during a midterm project review meeting in Nairobi, Kenya.
Follow-up survey data collection

After the successful treatment for two consecutive growing seasons, the second session of surveying was done. The follow up survey was done in the last quarter of the year 2016.

Structured questionnaires were used in the survey to collect relevant agricultural and socio-economic data at the household level. Food consumption diversity and nutrient intake were captured through dietary recalls.

Introduction of nutritionally enhanced KK 15 beans rich in iron and zinc and the improved Kuroiler chicken

Through the ADDA project, Africa Harvest introduced and promoted the improved Kuroiler chicken as well as the nutritionally-enhanced KK15 beans. These are important pro-nutrition innovations suitable for Nyamira and Kisii counties.

Kuroiler chicken

Kuroiler is a chicken breed with indigenous traits that grows faster and lays more eggs than the local chicken. Kuroilers were first successfully introduced in India more than a decade ago. The birds are low-maintenance and can grow and mature fast. Just like the local breeds, the Kuroilers can largely be kept under a free-range system, where the birds are left to scratch for food with no restrictions and very little or no supplements.

They have all the advantages of local chicken but grow faster and produce more eggs. Their feeding is not as strict as that of broilers and layers.

They offer a significant improvement in virtually all areas of breeding. While indigenous chickens lay 30–40 eggs per year, the Kuroilers can easily produce five times that number or around 150-200; they also grow to about double the body weight of their native counterparts.

Kuroiler hens mature between two and four months putting on 2 kg for hens and 3 kg for cocks by the

Africa Harvest supported farmers weighing Kuroiler Chicken in a farmer group meeting before the chicken was sold off in Kisii County.

A sample of fortified and nutritionally enhanced KK 15 beans being promoted in Kisii and Nyamira Counties by Africa Harvest under the ADDA project.
third month; and 3kg and 4kg respectively by the sixth month, with a mature Kuroiler cock weighing between 4 to 5 kg. At three months, the hens start laying eggs continuously for 2 years.

Compared to hybrids, their egg-yolk is even more yellowish and more nutritious. The egg is a good source of protein, Vitamin A and zinc, while the white meat of the birds is a very good source of protein, fat, and iron, which can prevent malnutrition.

*Kuroiler* chicks are more resistant to common diseases. They can be a source of income for smallholder farmers given the high demand and ready markets.

**KK 15 beans (*Phaseolus vulgaris*)**

KK 15 is a newly released high-yielding black bean variety from KALRO Kakamega. The black color is traceable to the enrichment of iron and zinc, which are important minerals needed for good health. The crop is more robust (bushy), early maturing and is resistant to bean common mosaic necrosis virus (BCMNV) and bean stem maggot. They are also resistant to bean root rot, a major constraint in bean production in high rainfall areas and improve soil fertility by fixing nitrogen, an attribute shared among all other legumes.

KK15, just like any bean variety, is a major source of protein, and provides dietary fiber and folic acid. KK 15 beans are improved and enhanced with iron and zinc which are important minerals that help in the prevention of iron deficiencies and prevention of anemia.

The beans are also a good source of income for smallholder farmers since they have ready markets due to their high nutrition attributes.

**Availability of KK 15 bean seeds and Kuroiler chicks**

The project facilitated the acquisition of KK 15 bean seeds, as well as day-old Kuroiler chicks to farmers who were willing to adopt the innovations. A supply chain was created between the suppliers of the two pro-nutrition innovations and the farmers from the groups in Kisii and Nyamira counties who were willing to buy and adopt the two innovations.

*KK 15 bean seeds being weighed and packed for distribution to farmers.*

*One-day old Kuroiler chicks being delivered to a farmer under the ADDA project.*
Farmers interested in placing orders did so from the beginning. Orders were placed through the group leadership with money being kept by the group treasurer until delivery.

Partnerships were created to enable constant supply of KK 15 beans as well as Kuroiler chickens to farmers. KALRO Kakamega and Guruvet Limited were brought on board to supply KK 15 beans and Kuroiler chicks respectively.

KALRO Kakamega is the center nationally mandated to breed and improve beans varieties; the center was brought on board to supply nutritionally enhanced KK 15 beans. Guruvet is involved in breeding and supplying Kuroiler chicken. The company has outlets in many parts of the country, including in the ADDA project target areas.

**Demonstration plots for KK 15 beans**

To assist selected farmers make decisions whether to adopt (or not adopt) the pro-nutrition innovation, demonstration farms of KK 15 beans were set up in Kisii and Nyamira counties. The sites were chosen by the farmers groups but hosted by one farmer who was also a member of the group.

The project provided the seeds and inputs such as fertilizer, pesticides, insecticides and fungicides while the farmer group identified the land and provided labor, mulching and manure application where necessary.

The two sites were taken care of and managed by the host farmer as part of ensuring sustainability when the project comes to an end. The groups were at liberty to agree on what to do with the produce after harvest. The demonstration sites were carefully chosen and had to be near a road for easy access and visibility to the public. The site had to have access to water in case of drought and host farmers who were willing to provide the necessary labor for best results.