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Innovation Lab for Food Processing and Post-harvest Handling



08 October 2019 | TSM 430: Project Management

Photo credit: Violet Mugalavai; University of Eldoret



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Feed the Future Program

Sustainably Reduce Global Poverty & Hunger

INDICATORS:

Prevalence of poverty &
Prevalence of underweight & stunted children



- Brings together 11 U.S. agencies (with **USAID** as lead agency)
- Host country-led priorities
- Focused on smallholder farmers
- Includes research, capacity building and developmental activities





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Feed the Future Innovation Labs

<u>Innovation Lab for Applied Wheat Genomics</u>	Kansas State University	<u>Innovation Lab for Genomics to Improve Poultry</u>	University of California, Davis
<u>Innovation Lab for Climate-Resilient Beans</u>	The Pennsylvania State University	<u>Innovation Lab for Horticulture</u>	University of California, Davis
<u>Innovation Lab for Climate-Resilient Chickpea</u>	University of California, Davis	<u>Innovation Lab for Integrated Pest Management</u>	Virginia Polytechnic Institute and State University
<u>Innovation Lab for Climate-Resilient Cowpea</u>	University of California, Riverside	<u>Innovation Lab for Legume Systems Research</u>	Michigan State University
<u>Innovation Lab for Climate-Resilient Sorghum</u>	University of Georgia	<u>Innovation Lab for Livestock Systems</u>	University of Florida
<u>Innovation Lab for Climate-Resilient Wheat</u>	Washington State University	<u>Innovation Lab for Markets, Risk and Resilience</u>	University of California, Davis
<u>Innovation Lab for Food Processing and Post-Harvest Handling</u>	Purdue University	<u>Innovation Lab for Nutrition</u>	Tufts University
<u>Innovation Lab for Food Safety</u>	Purdue University	<u>Innovation Lab for Peanut</u>	University of Georgia
<u>Innovation Lab for Food Security Policy Research, Capacity and Influence</u>	Michigan State University	<u>Innovation Lab for the Reduction of Post-Harvest Loss</u>	Kansas State University
<u>Innovation Lab for Food Security Policy</u>	Michigan State University	<u>Innovation Lab for Small-Scale Irrigation</u>	Texas A&M University
<u>Innovation Lab for Fish</u>	Mississippi State University	<u>Innovation Lab for Sorghum and Millet</u>	Kansas State University
<u>Innovation Lab for Sustainable Intensification</u>	Kansas State University	<u>Innovation Lab for Soybean Value Chain Research</u>	University of Illinois



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Innovation Lab for Food Processing and Post-harvest Handling

Goal:

To Develop **sustainable, market-driven** value chains to reduce food losses, improve **food and nutrition security**, and contribute to the **economic growth** for farmers in Kenya and Senegal



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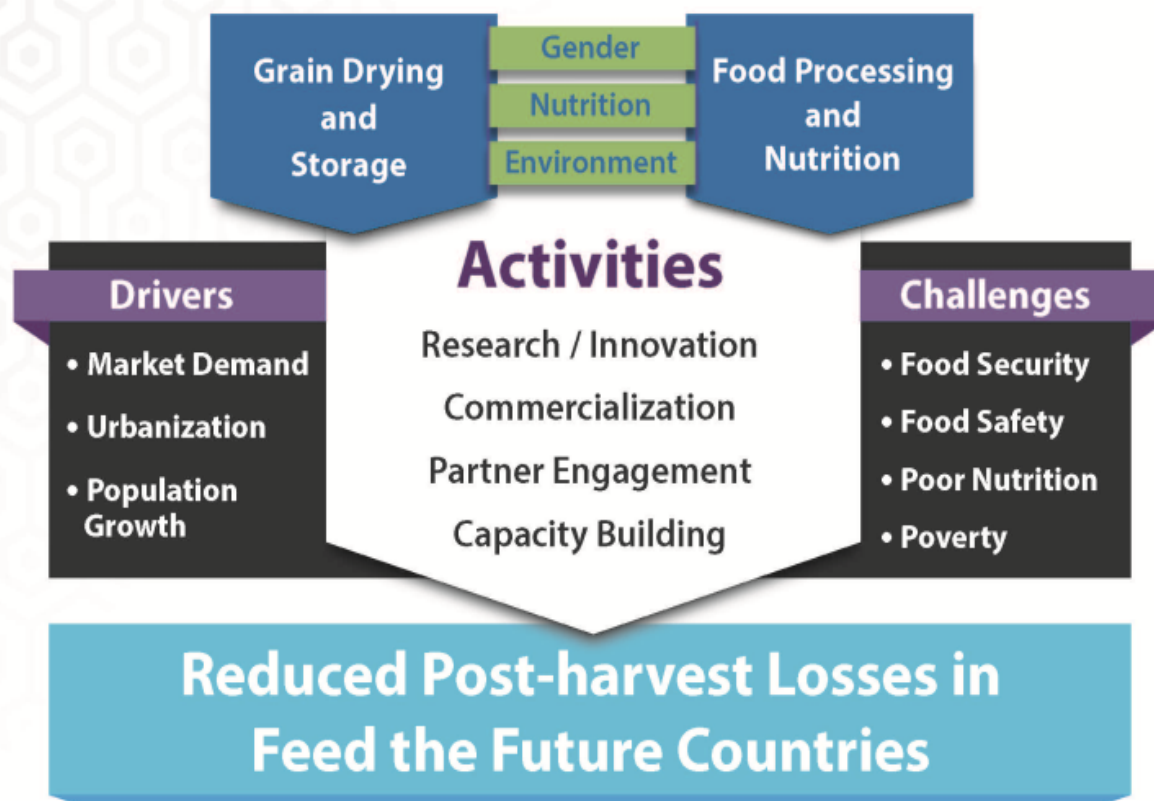
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Research Framework



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NOW ENTERING PHASE II (2019-2022), \$3 MILLION

Phase I ran from 2014-2019 (\$5 million for 5 years)

Focused on post-harvest value chains in Senegal and Kenya

Project had two main components

- i. Drying and Storage
- ii. Processing and Nutrition

Cross-cutting themes of:

- Gender and youth empowerment
- Creating sustainable post-harvest value chains
- Capacity building through short-term and long-term training
- Providing recommendations and best practices based on research



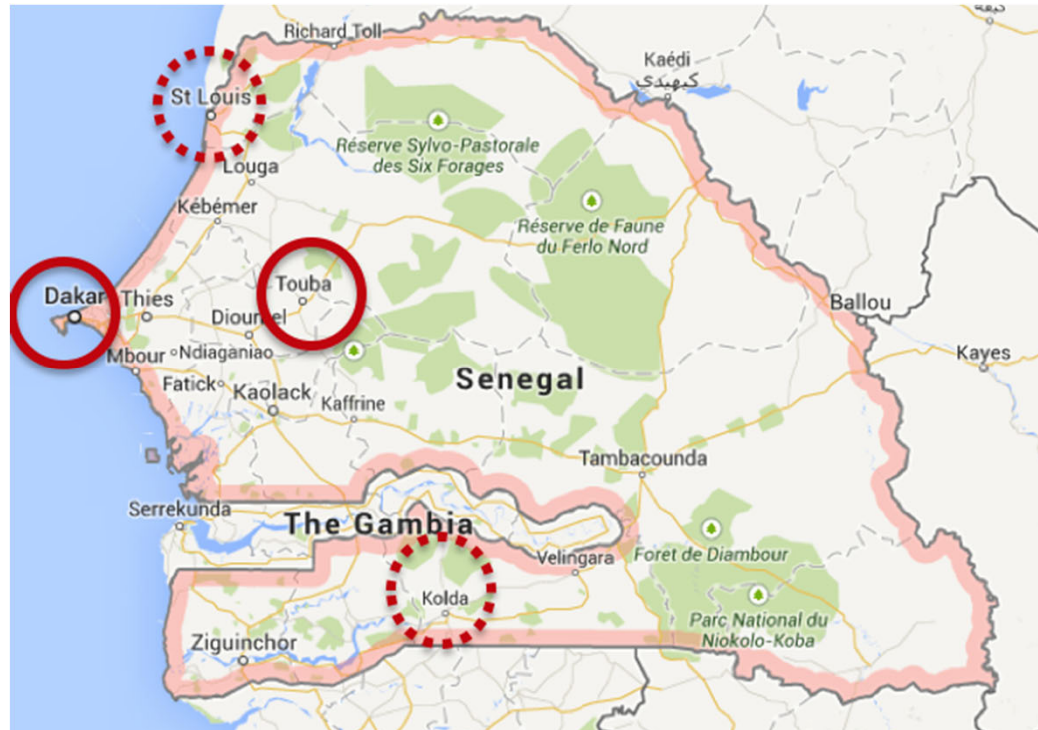
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Focus Countries and Partners



- **University of Eldoret, Kenya**
- **CIMMYT, Kenya**
- **Kenya Agriculture and Livestock Research Organization**
- **A to Z Textiles, Tanzania**



- **North Carolina State University**
- **University of Pretoria, South Africa**
- **Institut de Technologie Alimentaire, Senegal**
- **L'Institut Sénégalais de Recherches Agricoles, Senegal**



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Drying and Storage



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OBJECTIVE: Support smallholder farmers and small-scale traders dry, store, sell, and consume better quality maize.

- With lower levels of aflatoxin
- Improve food security
- Overtime help increase income and make market recognize and value quality maize.



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FPIL'S STRENGTHS IN DRYING AND STORAGE



Committed to drying and storage innovations for the smallholder farmer and small-scale trader in SSA.

- This demographic represents the majority of the population
- Improving their income and resiliency drives rural development.



Focused on technologies and innovations that are appropriate, sustainable, and scalable.



Focused on extension and commercialization of innovations that leads to market adoption.



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Extension

- Work with local partners to train smallholder farmers, traders and processors to on cost-effective post harvest practices to harvest, dry, store, sell and consume gains with safe levels of aflatoxins.
- **Goal:** train 20,000 more stakeholders in Phase II. Collaboration with other projects key.



Scale-up

- Work with private sector partners in Senegal and Kenya to develop supply-chain for post-harvest inputs (dryers, tarps, hygrometers, PICS bags).
- Support local women and youth groups to bridge “last mile: of supply chain.
- **Goal:** Sustainable supply chain where inputs are available in rural areas. Venders and farmers making money.



Research

- Understand how pre-harvest inputs (Aflasafe) and post-harvest inputs (tarps, hygrometers, PICS bags) can be used together or separately to lower aflatoxin levels in stored maize and groundnuts.
- Collaboration with FSIL and potentially peanut lab.
- **Goal:** Understand the most cost-effective combination of pre- and post-harvest inputs to reduce aflatoxin levels. Use this information to develop extension recommendations



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Processing and Nutrition



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Food Processing/Nutrition: Approach

- Product development, marketing, and promotion
 - Develop high-quality, safe, competitive food products
 - Disseminated through Incubation Training Centers; processing enterprises
 - Identify consumer drivers, make nutritious products to meet them – *market-led nutrition*
- Processing technology innovation
 - Appropriate, cost-effective technologies
 - Development/refinement
- Improvement of nutritional quality of products
 - Fortified products using local nutrient-rich plant sources
 - Maximized micronutrient (iron, zinc, pro-vitamin A) delivery to the body
 - Cereal processed foods providing fullness and satiety feeling
- Impact assessment: product and nutritional

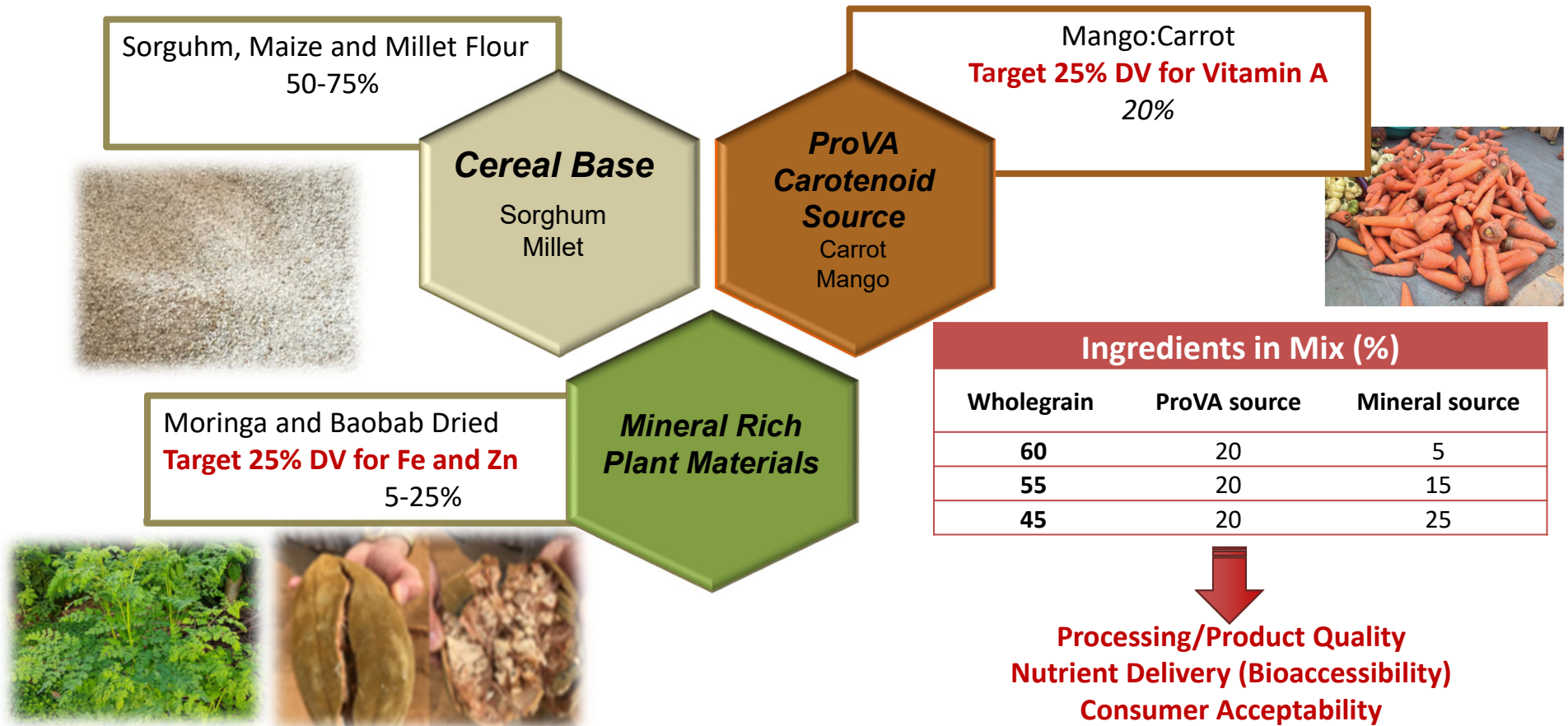




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Investigating Food-to-Food fortification strategies for improved delivery of micronutrients



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Leveraging extrusion technology to generate nutrition of whole grain cereal composites with provitamin A rich carrot and iron rich baobab

Formula:

WG Millet 75%

Carrot 20%

Boabab 5%

*Extruded at 35% Moisture



Fully cooked instant products



300µm sieve



500µm sieve



1700µm sieve



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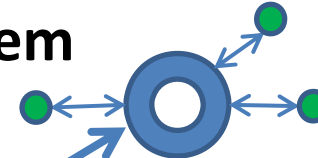
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Lebda, B. Faso



Hub-Spoke Food Innovation System

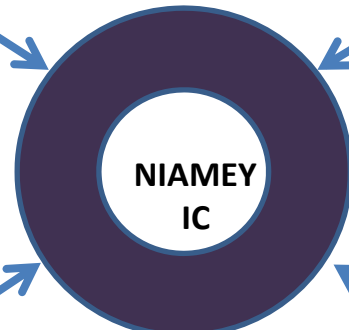


Diffusion out to remote villages

Sherkin Haoussa, Maradi, Niger

Rural Food Innovation Centers

- Basic food processing technologies
- Women associations
- Detailed training – processing/nutrition
- Establishment of rural markets
- Market access for smallholder farmers
- Sustainable aspect



Central Food Innovation Center at INRAN

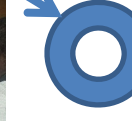
- Food processing technologies
- R&D
- Women association
- Detailed training – processing/nutrition
- Staff – food technologists, economist, nutritionist, communication specialists



Tera, Niger



Falwell, Niger



Gadan Iya, Maradi, Niger



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Mme Mbacke as a model for FPIL

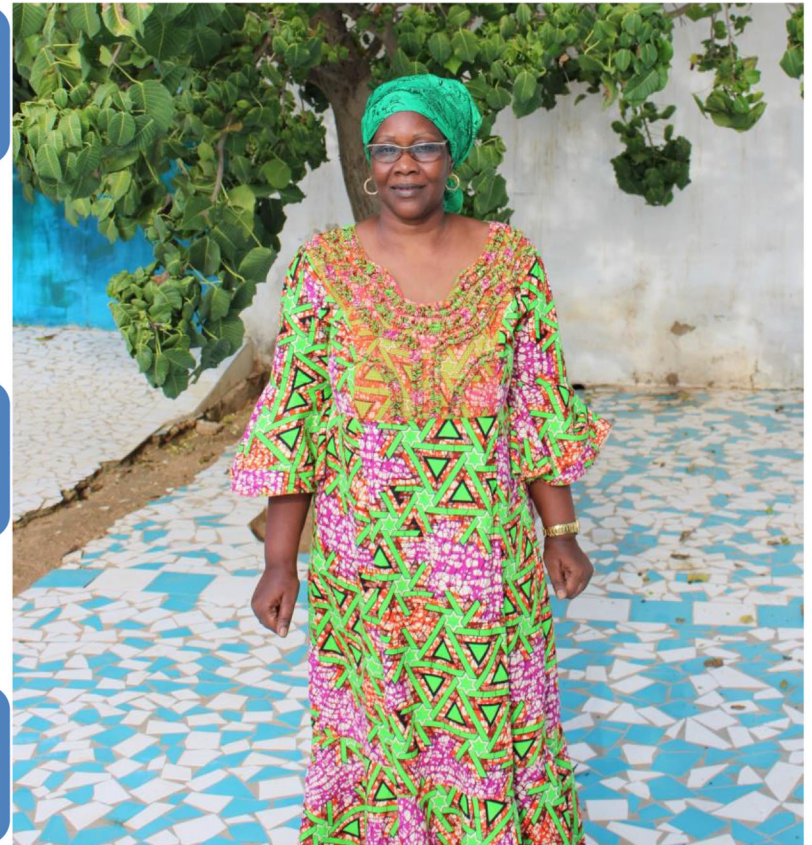
By 2014, FPL owned two Technochem mini extruder

- One was devoted to research-oriented applications housed at ITA
- The 2nd Ideal for creating small businesses at a community or village level

Among FPIL objectives, one was to create a full business model to be replicated if successful

- The model would be center around one of the main women entrepreneurs working in the field of agroindustry in Senegal

She owns Touba Darou Salam unit that serves 17 womens associations (living in the districts of Diourbel and Touba)



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CIMMYT
MR
International Maize and Wheat Improvement Center





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Order from CLM and commercialized fortified extruded flours

Zones	Quantity ordered in kg
Diourbel department	7318
Mbacke district	5066
Touba Department	9040
On coming order	9524

CLM will need 577 tons of fortified instant flours (made locally).

Many young entrepreneurs are interesting on commercializing the instant fortified flours.

World Food Program and UNICEF are also interested. FPIL is working on increasing Madame Mbacke's capacity to meet demands.





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