



***USAID Feed the Future***  
***Food Processing and Post-harvest Handling Lab (Food Processing Lab)***  
***Purdue University, West Lafayette, USA***

**Project Title:** Sustainable Reduction of Post-harvest Losses in Feed the Future Countries through Technologies and Innovations that Link Farmers to Markets: Focus on Kenya and Senegal

**Overview:** Hunger, malnutrition, and poverty remain stubbornly persistent in many developing countries despite advances made in agriculture productivity in recent years. This is due in part to high food losses, especially after harvest. The proposed research will support and strengthen the post-harvest segment of the value chain using a market-led approach to overcome constraints that create food losses in targeted Feed the Future (FTF) countries. This will be achieved through development and use of on-farm drying and storage technologies coupled with food processing innovations and mechanisms of dissemination that link farmers to markets. The project will focus on cereal (maize, rice, sorghum, millet) and grain legume (cowpea, soybean, peanut) value chains in Kenya and Senegal with two core research components: 1) grain drying and storage, and 2) food processing and nutrition. We also plan to work on a broader range of value chains, or critical aspects of them, in these and other FTF countries by garnering Associate Awards from USAID missions. The cross-cutting issues of gender, nutrition, and environment will be taken into account at all stages of the project cycle, from baseline assessment and analysis through research implementation, monitoring, and evaluation.

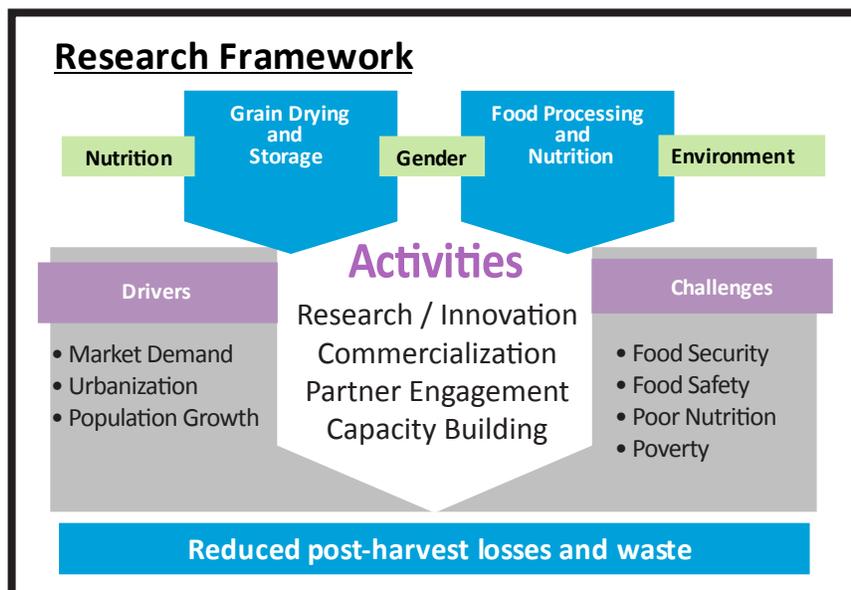
**Purdue and Collaborators' Experience:** The research will build on Purdue and its collaborators' record of research and development activities in the area of post-harvest commodity value chains leading to improved market access for smallholder farmers. Key results from past work includes the Purdue Improved Crop Storage (PICS) technologies that reduce losses due insect damage, and effective translational research to disseminate food processing technologies to rural and urban areas. Additionally, we have expertise and experience in drying technologies to decrease grain loss due to mold and translational nutrition to pursue a market-driven strategy to incorporate key shortfall nutrients into new and innovative products.

**Project Goal:** The overall goal of the project is to develop sustainable, market-driven value chains that reduce food losses, improve food and nutrition security, and contribute to economic growth for farmers in Kenya and Senegal, and other FTF countries. This is in line with FTF priorities as described in Sec. B.2.a. These models can then be scaled up with modifications to other countries.

**Research Framework and Research Components:**

This figure represents the overall research framework with its two research components.

1) Grain Drying and Storage - Post-harvest grain losses in Africa most often occur due to poor drying after harvest, causing mold contamination, and insect infestation during storage. The activities will focus on developing affordable drying, moisture testing, and storage technologies for smallholder farmers especially in the humid tropical regions of sub-Saharan Africa. Doing so will increase availability of high quality grains and legumes for commodity markets and for further processing into value-added products. 2) Food Processing and Nutrition - These efforts aim to increase and diversify food processing and markets for cereal and legume products at the rural and urban levels, and to create a sustainable market-driven model for nutritionally-enhanced foods. Overall, these efforts will increase market opportunities and enhance farmer linkages to markets. Research activities will focus on improvement of existing technologies and products, as well as development of new ones. Through innovative mechanisms for dissemination, these activities will improve quality, safety, and nutritional options for consumers, leading to increased market opportunities for producers.



### Specific Objectives:

1. Improve drying and storage of cereals and grain legumes in the humid tropics of Africa.
2. Drive the value chain through processing to increase commercialization and improve nutrition.
3. Strengthen institutional and human capacities among the actors along the value chains, with emphasis on gender sensitive approaches.
4. Establish and strengthen public-private partnerships to promote technology innovation and adoption.

### Impact Pathways:

OUTPUTS	OUTCOMES	IMPACTS
<ul style="list-style-type: none"> <li>• Technologies and innovations to improve quality and safety of grains and legumes after harvest</li> <li>• Diversify high quality and nutritious food products that drive markets</li> <li>• Evidence of strong public/private partnerships in reducing losses</li> <li>• Capacity for post-harvest research and development strengthened</li> </ul>	<ul style="list-style-type: none"> <li>• Improved grain handling and storage capacity</li> <li>• Improved quality and safer grains and legumes that meet local and international standards</li> <li>• Increased access to safe high quality and nutritious food products</li> <li>• Improved market opportunities and access for farmers</li> <li>• Improved quality of life for women and children</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced post-harvest losses in FTF countries</li> <li>• Improved food and nutrition security in FTF countries</li> <li>• Increased family incomes</li> </ul>

**Innovation:** The project approach will be innovative in reducing food loss in the following ways: 1) Application of market-driven approach to stimulate commercialization and expand market opportunities for smallholder farmers; 2) Implementation of value-chain approach to increase quantity and improve quality of grains at the farm level and through processing to make high quality, market-competitive products, including nutritionally-enhanced products using locally available nutrient-rich ingredients, to accelerate food and nutrition security; 3) Building local capacities (institutional and human) through introduction of new grain drying, storage, and processing technologies to strengthen the post-harvest segment of the value chain; 4) Development of effective and innovative strategies for delivery of viable technologies to respective end users, thus creating a successful model for scale-up with greater inclusion of the private sector; and 5) Focus on gender integration in all aspects of our work.