

## FEED THE FUTURE INNOVATION LAB FOR LEGUME SYSTEMS RESEARCH

The Feed the Future Innovation Lab for Legume Systems Research is a five-year research capacity building development program managed by Michigan State University that focuses on grain legumes in West and Southern Africa. Legumes are a nutrient-dense staple crop that have multifunctional roles in smallholder farm systems in developing countries including food and nutrition security, generating income, providing livestock feed and fodder, and contributing to the sustainability of soil systems through their nitrogen-fixing capabilities. Cowpea and common bean are the focal crops of the Legume Systems Innovation Lab.



### The Legume Systems Innovation Lab goals include:



Inclusive and sustainable agriculture-led economic growth



Strengthened resilience among people and systems



A well-nourished population, especially among women & young children

The strength of the Legume Systems Innovation Lab's design lies in its innovative and vibrant research to scaling strategy using a systems approach. Supported projects are diverse in research focus and address both the development and placement of innovative technologies with a thorough understanding of the systems they will impact thus leading to successful adoption. Projects are focused in three areas of inquiry:

- Integration of legumes into sustainable smallholder farming systems and agricultural landscapes
- Integration of legumes within local and regional market systems, including trade
- Analysis of sociocultural and/or economic motivators or barriers to legume utilization at various stages and scales within production and market systems

In addition, the Legume Systems Innovation Lab will focus on opportunities that address nutrition; the unique needs of women and youth; ensure greater resilience of people and systems under stress and shocks; and contribute to the development of human and institutional capacity for a resilient agricultural innovation system. Project activities are focused in the Feed the Future target and aligned countries of Benin, Burkina Faso, Ghana, Mali, Malawi, Mozambique, Niger, Nigeria, Senegal, and Zambia.

The Legume Systems Innovation Lab is funded by USAID under the Feed the Future Initiative.

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## PROJECT OVERVIEW:

### Sustainable Intensification of Dual-Purpose Cowpea Varieties for Enhanced Food and Fodder in Senegal



Principal investigator/Lead institution  
Dr. Augustine Obour, Kansas State University

Collaborating institutions

- Institut Sénégalais de Recherches Agricoles (ISRA), Senegal
- National Agency for Extension and Advising (ANCAR), Senegal
- Université Cheikh Anta Diop de Dakar (UCAD), Senegal

#### Project Overview

Forage availability for livestock is a major limitation for agro-pastoral systems in semiarid regions in sub-Saharan Africa.

Substantial research has been conducted to develop dual-purpose (i.e. grain and fodder), nutrient dense, cowpea cultivars (e.g., Lizard, Leona, Kelle, and Sam) for the peanut basin in Senegal. The new cultivars have “stay green” properties at maturity for improved fodder quality, and are tolerant to heat stress, which is ideal for production in the targeted regions of this research.

These new cowpea varieties have been available in Senegal only recently and best agronomic management practices and both productivity and economic performance in traditionally pastoral or cowpea cultivating areas has not been considered. Improved genetics paired with appropriate agronomic management and an understanding of socioeconomic tradeoffs is critical for driving dissemination and adoption by farmers with the ultimate goal of improving resilience, nutrition and food security of Senegalese smallholder farmers.

We will develop and evaluate agronomic management strategies for the sustainable intensification of dual-purpose cowpea (i.e. increased food, fodder quantity, and quality on the same land area) into smallholder agro-pastoral farming systems across the peanut basin in Senegal. The study will use multidisciplinary, farming systems approach based on the Sustainable Intensification Assessment Framework (SIAF) ([www.sitoolkit.com](http://www.sitoolkit.com)) and a participatory research model (i.e. “mother-baby trial”) to collect robust biophysical farming systems and socioeconomic data to identify enabling conditions for technology extrapolation and barriers to adoption that can guide future research and scaling.

Specific research objectives are 1) evaluate the dual benefits of cowpea varieties to increase both grain and fodder quantity and quality and 2) conduct a tradeoff assessment for cowpea markets with particular focus on tradeoffs and synergies between grain and fodder production in areas that are traditionally pastoralists compared to areas that traditionally grow cowpea.

Human and institutional capacity building will be integrated throughout with significant allocation of resources to both long-term graduate student training and short-term skill-transfer trainings.