



## FEED THE FUTURE INNOVATION LAB FOR LIVESTOCK SYSTEMS:

### AN UPDATE ON ACTIVITIES IN NEPAL – NOVEMBER 2016

The U.S. Agency for International Development (USAID) awarded the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) funds to establish the Feed the Future Innovation Lab for Livestock Systems. This five-year initiative (October 2015 to September 2020) supports USAID's agricultural research and capacity building work under Feed the Future, the U.S. Government's global hunger and food security initiative. The International Livestock Research Institute (ILRI) is the UF/IFAS partner in implementation of the Livestock Systems Innovation Lab (LSIL).



*Innovation Platform participants.  
Photo credit: M. Eilitta/IFAS-LSIL*

#### Background

The LSIL aims to improve the nutrition, health and incomes of the poor by sustainably increasing livestock productivity and marketing, and consumption of animal-source foods (ASF). This aim will be achieved by introducing new location-appropriate technologies, by improving management practices, skills, knowledge, capacity and access to and quality of inputs across livestock value chains, and by supporting the development of a policy environment that fosters sustainable intensification and increased profitability of smallholder livestock systems.

Our Management Entity at UF/IFAS supports and integrates efforts across the target countries, crystallizing and sharing knowledge generated across four Areas of Inquiry (AOIs) and three Cross-cutting Themes (CCTs). The LSIL draws on the expertise of target country, U.S. and foreign universities, institutes and organizations through competitively-funded long-term, multi-disciplinary, integrated applied research and capacity-building projects. Additional non-competitive research efforts complement the competitively-funded projects. Technologies, practices, and policies are analyzed in the context of future impacts and drivers.

#### Our grant portfolio

We fund the following types of grants:

- **Reach grants:** Competitive, larger grants of up to \$ 1,000,000, for projects lasting for up to four years. These involve multiple partners engaging in research and capacity building and employing an integrated multidisciplinary approach. One Reach grant has been awarded for research for development projects in Nepal.
- **Focus grants:** Competitive, smaller grants of up to \$150,000, for projects lasting up to one year. These are for proof of concept or research for development bridging studies. Three Focus grants have been awarded for research for development projects in Nepal.
- **Catalyst grants:** Unsolicited, short-term grants for UF faculty to initiate and implement initiatives that lead to larger projects. As of now, one Catalyst grant for Nepal has been selected.
- **Strategic partnerships:** Unsolicited, collaborative efforts with leading research or development institutions that complement the competitive research agenda.

#### Priorities for Nepal

To identify the priorities in Nepal, the LSIL representatives engaged more than seventy individual stakeholders during a scoping visit to learn about their perceptions of the priority constraints to ASF production and

consumption. This was followed by a multi-stakeholder Innovation Platform meeting that fostered more in-depth discussions, consensus building and joint, participatory identification of the most important priorities. The Nepal Innovation Platform meeting was held in Kathmandu on March 3-4, 2016, and it was attended by 75 individuals representing the Government of Nepal, non-governmental organizations, the private sector, universities, and research institutes. Of the 36 organizations that participated, 15 represented the private sector. The priorities for Nepal are presented in Appendix 1.

## Overview of ongoing and funded efforts

### **Non-competitive Catalyst projects:**

The LSIL plans to initiate efforts on the following Catalyst projects, developed based on the priorities identified during the Innovation Platform meeting. A complete description is available in Appendix 2. Additional Catalyst projects will be identified and developed in the future.

- **Workshop on livestock epidemiology, data analysis, and health policy.** The aim of this project is to enhance the knowledge and skills in the formulation, implementation, and evaluation of animal disease surveillance systems in Nepal. The workshop will in particular focus on livestock diseases of economic and public health importance for Nepal, including FMD, PPR and also addressing tuberculosis, brucellosis, mastitis and avian influenza. *Expected completion date:* January 2016.

### **Competitive Reach grants:**

Following a competitive process with 17 applications for research projects in Nepal that were reviewed by the LSIL Technical Evaluation Panel, the following four-year Reach grant project was selected for funding by the LSIL External Advisory Board and approved by USAID and the Ministry of Agricultural Development (MoAD). See Appendix 3 for a more detailed project description, including information on the Nepali and international collaborators.

- **Designing and evaluating innovations for development of smallholder female cooperatives in Nepal.** This project, led by the University of Florida, aims to design, implement, and rigorously evaluate three highly innovative and potentially transformative interventions to improve goat value chain functionality in rural Nepal. The project will address innovations in animal feeding, strengthening of animal health services through community animal health workers, and improving the efficiency and sustainability of cooperatives.

### **Competitive Focus grants:**

The LSIL received 25 applications for Focus grants for Nepal which followed a similar review and approval process as the Reach grants. The following three projects were selected for funding. See Appendix 4 for more detailed project descriptions, including information on the Nepali and international collaborators.

- **Empowerment of Village Women for Detection and Control of Livestock Diseases in Nepal.**

This project is led by Colorado State University. The goal is to establish a comprehensive program for reporting and control of livestock diseases in Nepal. The project will establish a rapid reporting and response network for livestock disease based on women from the communities. It will also develop or enhance the support structures necessary for success of the rapid reporting and response networks (e.g. field and laboratory testing) and



Female livestock keeper  
Photo credit: B. Thapa/IFAS-LSIL

preparation of the next generation of producers through school-based livestock clubs for youth.

- **Improving Dairy Animal Productivity and Income of Dairy Farmers through Effective Control of Mastitis Disease.** The project is led by Heifer International, Nepal. The primary objective of the proposed project is to increase the production and productivity of dairy animals, and thus the income of smallholder dairy farmers, through recommending appropriate strategies to control mastitis. The project will work in the Terai and Hills eco-zones and will focus on capacity building in good husbandry practices, including post milking teat dipping (PMTD) technology and dry cow therapy (DCT).
- **Feeding Support Tool Development for Enhancing Dairy Animal Productivity for Improved Livelihood of Smallholder Dairy Farmers in Nepal.** The project is led by Heifer International, Nepal. The overall goal of the proposed project is to increase household incomes and create improved livelihoods of smallholder dairy farmers through improvement of dairy animal productivity particularly through feeding management improvement. The project will (1) analyze existing dairy animal feeding practices and identify and recommend major areas for improvement; (2) Utilize software for balancing feed rations with available low-cost ingredients (e.g., forage, crop residue, by-products); and (3) Will strengthen the capacity of the frontline livestock extension workers and smallholder dairy animal farmers, especially women, on dairy animal feeding management

### Next steps

- Reach and Focus grant project start dates: November-December, 2016.
- Innovation Platform meeting: December 2016 - January 2017. The purpose is to ensure that all relevant stakeholders are aware of the funded projects and can provide advice to the project team and support implementation of the projects.

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## Appendices:

### Appendix I. Priorities developed for Nepal

#### ASF Production and Marketing

- Increase feed and forage production through preservation, improved varieties and access to other forage resources
- Increase access to markets for milk, meat, and eggs from smallholders
- Improve selection and management of indigenous breeds of buffalo, goat and chicken.
- Increase production of quality milk through selection for productivity and improved milking management and milk collection

#### Livestock Disease Management and Food Safety

- Control of Transboundary Animal Diseases (FMD, PPR)
- Enhancement of ASF safety pre- and post-harvest
- Improvement of human, animal and environmental health under a One-Health platform

#### Enabling Policies and Future Systems

- Increase percentage of female extension agents
- Examine future competitiveness of Nepali livestock value chains (goat, pigs, and buffaloes)
- Support development of a Livestock Action / Master Plan on the basis of the Agricultural Development Strategy (ADS) guidelines
- Improved disease modeling and understanding disease dynamics (including impacts of breed selection)
- Understand impact of outmigration and rural to urban migration on livelihoods and livestock sector development, with particular attention to Gender equality and social inclusion (GESI) issues and household modeling
- Animal welfare and ethical treatment of animals

## Appendix 2. Ongoing Catalyst projects

### Catalyst grants

#### I. Workshop on livestock epidemiology, data analysis, and health policy

**Principal investigator and lead institution:** Dr. Jorge Hernandez, University of Florida

**Brief summary:** Animal disease surveillance systems are a key component for early detection and management of livestock diseases of economic and public health importance (e.g., foot and mouth disease [FMD], tuberculosis, brucellosis, mastitis, avian influenza, and pestes des petits ruminants [PPR]). Epidemiologic methods and techniques are used for formulation, implementation and evaluation of national animal disease surveillance systems. Animal health policymakers require timely data and information for selection of risk management options that are feasible and acceptable for disease control and prevention. This activity will provide a forum for young university scientists and regulatory animal health professionals (e.g., from Nepal Agriculture and Forestry University; veterinarians or epidemiologists from Nepal's Ministry of Livestock Development; and veterinarians and possibly other project staff from USAID-funded projects [PAHAL and SUAHAARA] and implementing partners [iDE and Heifer International]) that can impact health policy, to exchange information, and to enhance their knowledge and skills in the formulation, implementation, and evaluation of animal disease surveillance systems in Nepal. Program activities include a five-day workshop that will target four key issues: (i) Evaluation and application of official diagnostic tests used in national government veterinary services; (ii) Design and analysis of epidemiologic studies to measure disease burdens and to identify risk factors associated with farms affected with selected diseases (eg, FMD, PPR, other diseases) in animal populations; (iii) Methods and concepts used in animal disease surveillance programs that take into consideration efficacy and system costs (efficiency); and (iv) Workshop participants will have the opportunity to share data or project progress related to animal disease surveillance programs that are relevant in Nepal; presentations will be followed by a session focused on questions and answers from peer-participants and feedback from invited instructors.

**Activities conducted to date:** The training is tentatively planned for December / January 2016.

## Appendix 3. Funded Reach projects

### I. Designing and evaluating innovations for development of smallholder female livestock cooperatives

**Principal Investigator (PI) institution:** Conner Mullally, University of Florida

**Co-PI and Collaborator institutions:** Montana State University, University of Georgia, Nepal Agricultural Research Council, Interdisciplinary Analysts, and Heifer International.

**Summary:** In Nepal, goats are an essential source of income and animal-source foods and nearly every rural Nepali household owns at least a small quantity of goats. Recently, rising urban incomes have translated into higher demand for goat meat but a poorly functioning value chain and limited access to animal feed have left poor smallholders, most of whom are women, unable to benefit. Specific constraints include lack of year-round access to nutritious feed, scarce extension and veterinary services, and poorly functioning output markets, including weak bargaining power and a lack of communication infrastructure.

The objectives of the project are to: (1) Increase feed and forage production through preservation, improved varieties, and access to other forage resources for improved livestock productivity; (2) Increase access to markets of meat goats for smallholders in order to improve household income, nutrition, and food security; and (3) Increase the percentage of female Community Animal Health Workers (CAHWs) for improved livestock productivity and reduction of animal disease. To address these objectives, the project designs, implements, and rigorously evaluates three interventions to improve goat value chain functionality in rural Nepal. These include:

- Evaluation of several drought-resistant forage varieties, disseminated through CAHWs trained by HI-N and promoted within HI-N smallholder cooperatives. The Nepal Agricultural Research Council (NARC) will direct this effort, working in four different research locations and collaborating with HI-N and producer cooperatives to introduce varieties and the package of services offered to cooperatives, while training members on the use of silage to reduce the need for new green fodder in the dry season.
- Assessment of distance learning platform that will make it easier for women to become CAHWs: The project will develop and pilot this platform which will consist of a) a short workshop at a central location for an introduction to and receipt of training materials, including a tablet computer pre-loaded with the government-approved curriculum for training animal health workers and sufficiently ruggedized for the conditions of rural Nepal, b) one or more short in-person follow-up training sessions, c) apprenticeship and/or mentoring from a previously trained CAHW, d) regular tablet-based tests for assessment of learning, and e) final workshop and graduation ceremony. To strengthen the quality of mentorship, experienced CAHWs will be provided mentorship training.
- Assessment of an SMS-based information sharing platform that will improve cooperative efficiency and sustainability: Through the SMS platform, cooperative leaders will communicate with a single member of each SHG (organized by HI-N and consisting of 20-30 women) who will provide their cooperatives with regular updates on the goat inventory of their members; this information will be used by cooperatives to negotiate with buyers. The SMS platform will also be used to communicate information on disease outbreaks, availability of CAHWs, and other services.

The communication interventions will be evaluated using a randomized control trial spanning 109 Village Development Committees in 27 districts, including eight in the Feed the Future (FTF) Zones of Influence (ZOIs).

**Activities to date include:**

- Review HI-N monitoring data, construct baseline data set: Baseline will be built by closely reviewing existing HI-N monitoring data from the study area, and converting raw data into usable baseline values.
- Initial stakeholder meeting is planned for late November or early December. This meeting of the research team and stakeholders will have as its primary objective to engage these key stakeholders in the intervention design process.

## **Appendix 4. Funded Focus projects**

### **I. Empowerment of Village Women for Detection and Control of Livestock Diseases in Nepal**

**Principal investigator and lead institution:** Dr. Richard A. Bowen, Colorado State University

**Co-PI and Collaborator institutions:** Nepal Agricultural Research Council, Ministry of Livestock Development, Himalayan College of Agricultural Sciences and Technology

**Brief summary:** The fundamental objective of the project is to establish a comprehensive program for reporting and controlling livestock disease in Nepal, based on the empowerment of village women and interactions with the Department of Livestock Services. The goal is to implement a bottom-up approach to livestock disease monitoring that will effectively meld with the traditional top-down approach for disease control. Specific objectives and associated activities for this effort are:

1. Establish a rapid reporting and response network for livestock disease based on women from the communities. This approach will exploit mobile phone technology and serve multiple purposes, including the empowerment of women, estimating the burden of individual livestock diseases with an eye toward prioritizing expenditures for control, and enhancing control of livestock diseases. The response arm of the network will consist of veterinarians, para-veterinarians, and extension agents from the Department of Livestock Services; linking these two entities effectively will be key to success of the program.
2. Develop or enhance the support structures necessary for success of the rapid reporting and response networks and preparation of the next generation of producers. Key capacity development efforts that will address these issues are:
  - Organization of school-based livestock clubs for youth that will provide education in livestock disease recognition and control, production hygiene and food safety, and record keeping.
  - Implementation of effective and affordable field and laboratory testing to support diagnostic accuracy and establish the priorities for disease control.

### **2. Improving Dairy Animal Productivity and Income of Dairy Farmers through Effective Control of Mastitis Disease**

**Principal Investigator and lead institution:** Dr. Keshav Prasad Sah, Heifer Project International Nepal

**Co-PI and Collaborator institutions:** Department of Livestock Services, Himalayan College of Agricultural Science and Technology

**Brief summary:** Dairy is the most important sub sector of livestock production in Nepal and contributes almost two-thirds to the livestock share of the GDP. Despite this, the per capita availability of Animal Source Food (ASF) in terms of milk and milk products is low (60 kg per capita per year), mainly due to low levels of productivity. The low level of productivity is the cumulative effect of poor genetics, poor and inappropriate feeding management, and a large number of diseases of economic significance. Mastitis is one of the most significant diseases of dairy animals and has multifaceted dimensions including economic losses to farmers, technical significance to the dairy processing industry, and health hazards to consumers. The primary objective of the proposed project is to enhance the livelihoods of smallholder dairy farmers through increased income from productivity improvement of dairy animals by the effective control of mastitis. The specific objectives are to: (I) Identify major gaps

in Good Husbandry Practices (GHP) adoption (barn hygiene and animal health, personal hygiene and cleanliness of dairy equipment), associated constraints and motivational factors for adoption by smallholder dairy farmers; (2) Examine and quantify the correlation between conductivity readings (through Lactoscan) and somatic cell count (SCC) in cows with or without mastitis; (3) Identify proper extension approaches/tools for wider scale use of mastitis control technologies; (4) Identify the most effective antibiotics for clinical mastitis cases; and (5) Create awareness about the effect of clinical mastitis and haphazard use of antibiotics in developing livestock and human health hazards among smallholder farmers.

The activities will be implemented in four districts of the mid-western development region, namely in the Surkhet, Bardiya, Banke and Dang districts. A total of 400 dairy animal keeping households (100 from each district) will be included in this project. Policy recommendations will be made motivating farmers for the adoption of GHP, Post Milking Teat Dipping (PMTD), and Dry Cow Therapy (DCT) technologies for mastitis control, and a training course will be developed to help farmers easily adopt the good practices.

### **3. Feeding Support Tool Development for Enhancing Dairy Animal Productivity for Improved Livelihood of Smallholder Dairy Farmers in Nepal**

**Principal investigator and lead institution:** Mr. Bhola Shankar Shrestha, Heifer Project International Nepal

**Co-PI and Collaborator institutions:** Nepal Agricultural Research Council, National Dairy Development Board

**Brief summary:** The productivity of dairy animals (cattle and buffalo) in Nepal is generally low due to the cumulative effects of poor genetics, poor and inappropriate feed management and a large number of diseases. The most critical factor associated with low productivity is improper (inadequate and unbalanced) feeding. The overall goal of the proposed project is to increase the household income and create improved livelihoods of smallholder dairy farmers through improvement of dairy animal productivity particularly through feeding management improvement. The specific objectives are: (1) To analyze existing dairy animal feeding practices and identify major areas for improvement; (2) Develop and utilize a Feeding Support Tool (FST)/Ration Balancing Software (RBS) to enhance dairy animal productivity; and (3) Strengthen the capacity of the frontline livestock extension workers and smallholder dairy animal farmers (especially women farmers) on dairy animal feeding management.