



# 2017 ANNUAL REPORT

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**ADMI** ADM Institute for  
the Prevention of  
Postharvest Loss



**I ILLINOIS**

College of Agricultural, Consumer  
& Environmental Sciences



# LETTER FROM THE DIRECTOR

Greetings from the ADM Institute for the Prevention of Postharvest Loss (ADMI). In the few months I have served as director, I have developed a great appreciation for the Institute's staff, supporters, partners and previous leaders, whose contributions have had a real impact on improving food systems to reduce postharvest losses and expand food security. To those supporters and affiliates reading this note: Thank you.

I am impressed by how much the Institute has accomplished since its establishment in 2011. Initial efforts raised awareness of postharvest loss issues, helped to create a community of interest, and contributed to raising the quality of the debate about food loss between field and final market.

The effort to stimulate discussion was demonstrated at the 2015 International Congress on Postharvest Loss Prevention, which highlighted, among other things, the need for drying and storage technologies that are accessible for smallholder farmers. Responding to the identified needs, ADMI researchers, with partners in Bangladesh and India, developed the ADMI Grain Handling System involving small-scale dryers and hermetically-sealed bags. These technologies are now beginning to scale through outreach efforts of colleagues in India and Bangladesh.

Even as we build on these and other accomplishments, new challenges are emerging. It is increasingly clear that policy and markets influence many postharvest management decisions. A new project with the International Food Policy Research Institute will directly address these issues through training programs for policymakers responsible for handling Bangladesh's massive volume of public grain stocks and through analyses to help us better understand the country's traders, millers, and distributors.

Whatever future challenges arise, it will be critical to have committed individuals with technical expertise to address the issues. With the future in mind, I am pleased to announce the launch of the PHL Scholars program to provide graduate training to young scientists who will form the next generation of postharvest loss experts. The first cohort of PHL Scholars will be selected in May 2018. I look forward to highlighting their accomplishments in a future report. Until then, I hope readers will continue to support the cause.

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## About ADMI

In 2011, The Archer Daniels Midland (ADM) Company's gift of \$10 million established the ADM Institute for the Prevention of Postharvest Loss (ADMI) at the University of Illinois. The institute was created to address the large volumes of staple crops lost each year in food chains around the world. The institute's mission is to be an international hub for evaluating, creating and disseminating economically viable technologies, practices, and systems that reduce postharvest losses of commodities, including rice, wheat, maize, and oilseeds.

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# ADMI 2017 HIGHLIGHTS

The ADM Institute for the Prevention of Postharvest Loss fosters research to find practical solutions for postharvest loss, engages in outreach to implement solutions that have been developed, and builds capacity to empower people and institutions to address postharvest loss into the future. The impact of the work is expanded through cooperation with partners around the world and across the University of Illinois campus. This report details some of our work this year.

## Finding Solutions

- Increased the flexibility of dryer technology in Bangladesh
- Second round of household survey in Bihar demonstrated farmer takeup of hermetic bags responds to education
- Bihar research found proper drying and use of hermetic bags reduced aflatoxin incidence in maize stored on farm from 36% to 4%
- Farm trials in Bangladesh demonstrated improved seed germination through use of ADMI-promoted methods
- Transport study in Brazil identified factors driving soybean losses during truck transport

## Implementing Solutions

- Through Bangladesh Agricultural University, trained 1,600 people in grain drying and storage methods
- Through the ADMI Village in Bihar, India trained 5,000 people in use of grain dryers and hermetic bags
- Introduced postharvest loss (PHL) trainings by women and for women in India
- Contracted with manufacturers to build grain dryers for use by small scale farmers in Bangladesh
- Identified local manufacturer to produce hermetic bags in Bangladesh
- Collaborated with farmer cooperative in Brazil to address PHL concerns

## Building Capacity

- Helped establish postharvest laboratory facility in Bangladesh
- Launched program for training Bangladesh government officials in food policy analysis
- Leveraged Sierra Leone Agricultural Business Centers for hands-on training on postharvest loss issues for Njala University and University of Illinois students
- Supported experiential learning program on PHL in India for University of Illinois students
- Supported graduate degree training of 13 students at Bangladesh Agricultural University and the University of Illinois

## Spreading the Word

- New ADMI website reaches global audience, with most the most visits from the U.S., India, Nigeria, Bangladesh, and the Philippines.
- Appearance at the NYC Food Tank Summit "Focusing on Food Loss and Food Waste"
- Supported the "Disrupting Food Logistics" workshop
- Partnered with USAID and Rockefeller Foundation in PYXERA Global's Food Loss twitter chat
- ADMI was featured as the cover story in the November 2017 issue of *World Grain Magazine*.



Read the World Grain article at [go.illinois.edu/worldgrain](http://go.illinois.edu/worldgrain)





# RESEARCH

## FINDING PRACTICAL SOLUTIONS FOR POSTHARVEST LOSS

### ADMI Grain Handling System

ADMI-supported researchers in South Asia and the United States have developed the ADMI Grain Handling System as an affordable and scalable postharvest loss prevention strategy in India and Bangladesh. High moisture content is a leading cause of PHL in smallholder farmers's stored grains. Traditional sun drying by spreading grain on the ground is labor-intensive, exposes grain to losses and damage, and can be undermined by untimely rains. Traditional methods of storing grain in permeable containers lead to rising moisture content with changes in weather and exposes grain to pest damage.



The ADMI Grain Handling System combines a small-scale grain dryer with hermetic bags to make improved drying and storage available to smallholder farmers. The grain dryers, inspired by the STR dryer developed in Vietnam, are adapted for local conditions in India and Bangladesh. Each dryer has a half-ton capacity and decreases moisture levels from 20% to 12% in 4 hours. Hermetic bags are a proven technology, but are not widely adopted in South Asia and only achieve optimal impact when combined with properly-dried grain. ADMI researchers have studied the impact of combined dryers and hermetic bags in labs and in farmers' homes. The results, described in this report and in earlier ADMI reports, show that the system enables farmers to keep corn, wheat and rice at an appropriate moisture content for safe storage, can eliminate pest damage, and can prevent aflatoxin emergence in stored grain. The system is also economical. A Bangladeshi farmer drying her own grain and providing drying services for a fee to neighbors can recover the cost of investing in a dryer in 2 years. Hermetic bags pay for themselves if they are re-used over multiple seasons. The return on investment is even greater if farmers receive a quality premium for well-stored cereal in the market.



ADMI has expanded the reach of this system in Bangladesh through a partnership with Kansas State University and Bangladesh Agricultural University in the USAID Feed the Future Innovation Lab for the

Reduction of Post-Harvest Loss (PHLIL). Partners at Bihar Agricultural University, Dr. Rajendra Prasad Central Agricultural University (DRPCA), and the Borlaug Institute of South Asia (BISA) are helping adapt and disseminate the system in Bihar, India.

# Postharvest Technology for Improving Smallholder Income and Food Security

Launched in the state of Bihar, India, in 2015, the Improving Smallholder Income and Food Security (ISIFS) project is a multifaceted field-based study to assess the market viability and technical effectiveness of hermetic bags as used by farmers. The project goals are to determine how well the bags perform in actual use, measure farmers' willingness to pay for the bags and the factors that affect their valuation of them, and identify the grain quality traits that affect the prices farmers receive. The study combines a randomized controlled trial of bag distribution with laboratory analysis of grain quality, auctions to determine willingness to pay, a survey of traders, and technical monitoring of grain quality. Drs. Kathy Baylis and Kent Rausch from the University of Illinois lead this project in partnership with Dinesh Rajak at the Dr. Rajendra Prasad Central Agricultural University (DRPCA), Satish Kumar and Ashok Kumar at the Bihar Agricultural University, and Dr. Rajkumar Jat at the Borlaug Institute of South Asia (BISA).

## Overview of Study Area: Bihar, India

- Annual per capita income of USD 250
- Majority of the population is rural
- 90% of cropped land is used for food grains (rice, wheat, maize)
- 83% of farmers have less than 1 hectare

## Project Activities

- Distributed 2,500 hermetic grain storage bags by auction in 44 villages across 5 districts, and 1,500 bags at no cost in 32 villages.
- Trained 1,100 farmers in 22 villages on mycotoxin contamination, health risks, and safe storage practices to minimize contamination.
- Tested grain samples for aflatoxin in collaboration with IFPRI and ICRISAT.
- Measured trader and end-user preferences for various grain quality attributes.
- Conducted field experiments for impact evaluation by gathering survey data on postharvest management, postharvest losses and food security from more than 4,000 farm households before and after the distribution of hermetic bags over randomly selected treatment and control villages.

## Selected Findings

- Farmers show strong demand for hermetic bag storage technology: Auction data show farmers are willing to pay an average of USD 0.40/bag, more than three times the cost of traditional jute bags. When health and food safety information is provided, farmers' willingness to pay increased by more than 20%.
- Farmers experienced a 14% reduction in storage losses when using hermetic bags.
- An initial aflatoxin test of farmers' stored grain revealed high incidence of contamination, 36% in traditional bags, versus 4% in samples stored in hermetic bags. No farmers were aware of aflatoxins prior to trainings given during the project.
- Quality losses resulting from poor postharvest management result in a 30% price discount.

## STUDENT SPOTLIGHT



PALLAVI SHUKLA

Pallavi Shukla is working on a PhD in agricultural and applied economics at the University of Illinois and serves as a researcher on the ISIFS project. Through interviews with farmers and lab tests of grain samples, the research team including Shukla found postharvest loss problems go beyond physical losses to include quality losses, as aflatoxin infestation in improperly stored corn made it unsafe for consumption. Though studies had demonstrated that hermetically-sealed bags could prevent aflatoxin emergence, farmers were largely unaware that their grain stores were becoming unhealthy to eat. The team concluded that if farmers were unaware of the danger of aflatoxins, they couldn't know the value of proper storage. The project to distribute storage bags expanded to include educating people about food safety benefits. The result was a measured increase in farmers' willingness to pay for improved bags in market auctions. After graduation, Shukla hopes to continue to do research either in academia or an international development organization.



For more information  
[go.illinois.edu/phltech](http://go.illinois.edu/phltech)



# Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss

The ADM Institute for the Prevention of Postharvest Loss partners with Kansas State University on the U.S. Government's Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss (PHLIL). This \$5 million USAID project operates in Bangladesh, Ethiopia, Ghana, and Guatemala. ADMI concentrates its activities in Bangladesh, working closely with Bangladesh Agricultural University (BAU) and has provided support to work in other PHLIL countries as well.

## Highlights from Bangladesh

- BAU researchers modified the Vietnamese STR dryer to support a range of batch sizes (rather than running only 500 kg lots) and to adapt to greater temperature control using rice husk briquettes. The BAU-STR dryer can be combined with locally available hermetic bags in the ADMI Grain Handling System.
- BAU scientists analyzed rice from farmers' supplies for 4 growing seasons, confirming that mycotoxins are less pronounced in rice than in maize.
- Data showed that rice stored in hermetic bags could be kept in homes and achieve continuous moisture content of 12% while the moisture content of rice in other systems in the same homes rose to over 20%.
- Researchers found no insect infestation in rice stored in hermetic bags, while rice stored in traditional systems in the same homes had more than 800 insects per kg of grain.
- Farmers using BAU-STR dryers achieved 95% germination rate from saved seed, as opposed to 35% for other households.
- Economic analysis indicates that a farmer investing in a BAU-STR dryer and providing fee-based services to neighbors can recover the costs of the investment in 2 years.
- BAU collaborators Dr. M. Alam, C. Saha, M. Momin, M. Awal, M. Hossain, M. Ali and others published 4 articles in scholarly journals and made 11 scientific presentations in major conferences in 2017, ensuring that their discoveries find a wide audience.



## Other PHLIL Highlights

ADMI has expanded its impact and reach by supporting PHLIL in its work in countries other than Bangladesh. Activities supported by ADMI include:

- Ethiopia: A country-wide survey on losses to stored wheat due to insects showed that the use of hermetic bags, metal silos, and plastic drums decreased the grain volume loss due to insects from 9.6% to 0.2-0.7% after 6 months of storage.
- Ghana: Local production began in November on a low-cost moisture meter used to reduce postharvest losses in maize in central and northern Ghana.
- Guatemala: In partnership with the Buena Milpa project, PHLIL held a mycotoxin symposium in August 2017 that sought to compile results from multiple projects and identify priorities for future work.



## Empowering Women in Bangladesh

In many rural households in Bangladesh, work related to drying and storing rice falls to women, but they have little say over economic decision-making. With access to hermetic bags and BAU-STR dryers, some women are saving time, gaining new income sources, and playing expanded roles in their communities. Khodeza (pictured at left), who lives in Phulpur sub-district of Mymensingh in northern Bangladesh, is a lead farmer for a pilot training program on rice drying and storage in her village. With use of a BAU-STR dryer and training from PHLIL and ADMI, she and her neighbors are reducing post-harvest loss and improving their economic well-being.



Read more in the  
PHLIL Annual Report  
[go.illinois.edu/PHLIL](http://go.illinois.edu/PHLIL)

# Appropriate Scale Mechanization Consortium



The Appropriate Scale Mechanization Consortium (ASMC) was created in 2015 with a \$4.7 million subaward from the Feed the Future Sustainable Intensification Innovation Lab (SIIL) based at Kansas State University. The ASMC is led by University of Illinois faculty members, with support from the ADM Institute. ADMI support allows the ASMC to address postharvest mechanization concerns. The ASMC aims to develop and implement mechanization interventions that enable smallholder farmers to adopt sustainable intensification practices that might otherwise be too labor intensive to apply. The program is especially interested in innovations that ease labor burdens on women. The Consortium includes members from 4 U.S. universities as well as institutions in Bangladesh, Cambodia, Ethiopia, and Burkina Faso.

## ASMC Postharvest Initiatives

**Bangladesh:** On-farm grain drying and other postharvest activities are often defined as women's work in Bangladesh and require significant time commitments. In addition, postharvest losses imply a pressure to intensify production in ways that may be unsustainable. As a result, efforts to mechanize drying and other postharvest activities for rice in Bangladesh can contribute to easing the labor burden on women while improving sustainability. With colleagues at Bangladesh Agricultural University, ASMC is integrating postharvest loss prevention through work on dryers and on information and communication systems to enhance markets. These themes were on display at the 2017 ASMC symposium in Dhaka (see box).

**Burkina Faso:** Animal power is central in Burkina Faso. Working with the NGO Tillers International, animal-driven row planters and between-the-row weeders have been adapted to local conditions and improved yokes have been developed to support better threshing and transportation of grain. Local manufacturers are building and selling these new implements.

**Cambodia:** In cooperation with the Horticulture Innovation Lab, a small-scale mobile chiller has been piloted with farmer groups in Siem Reap to allow them to transport and market refrigerated produce.



## Student Competition at ASMC Symposium

ADMI co-sponsored the 2017 ASMC Symposium in Bangladesh, providing funds to support prizes for students that submitted the best ideas for improving agriculture in Bangladesh. Students from 7 Bangladeshi universities submitted more than 60 research proposals, and 5 teams were chosen to receive awards.

The goal of the competition was to encourage innovation and entrepreneurship related to agricultural technologies. The ideas in the winning proposals included smartphone apps for agricultural trade and technology, monitoring systems for marketing, and sustainable agricultural business models, all of which hold potential to enhance market coordination or market efficiencies in ways that can reduce postharvest losses. The winning proposal for a zig-zag mechanical dryer represented further adaptation of the STR dryer used in the ADMI grain handling system.

The top five teams each received a prize of 40,000 Taka and more importantly received feedback from researchers and professionals for taking their ideas to the next level. ACI Motors, another sponsor of the symposium, offered to fund and provide guidance to any of the winning teams as they seek to develop their concepts further.



Visit the ASMC website  
[go.illinois.edu/ASMC](http://go.illinois.edu/ASMC)



# Postharvest Loss Prevention in Brazil

## Understanding Losses in Transportation

In Brazil, over 60% of soybeans are transported by truck from farms to processing, storage, and export terminals. Poor road conditions, improper truck maintenance, overloading, and inefficient transfer of grain all cause transportation losses. Dr. Richard Gates from the University of Illinois and partners in Brazil designed, fabricated, and tested a probe for recording CO<sub>2</sub> concentration and other grain conditions during truck transport.

Project findings include:

- CO<sub>2</sub> concentration increased with moisture, temperature, and trip duration, ranging from 2,000 to 200,000 parts per million
- Monitoring CO<sub>2</sub> provides earlier detection of spoilage than temperature monitoring. CO<sub>2</sub> levels reflect the amount of grain dry matter loss due to grain respiration.
- Nearly 3 out of 4 vehicles used for short-haul transport of grain were overloaded by 10 to 37%, which contributes to grain losses.



Read more about  
Rich Gates' project  
[go.illinois.edu/  
gatesarticle](https://go.illinois.edu/gatesarticle)

## Postharvest Loss in Paraná

Dr. Mary Arends-Kuenning from the University of Illinois has been establishing levels of postharvest loss in the state of Paraná, Brazil. In collaboration with a large cooperative in western Paraná, Cooperativa Lar, researchers identified cooperative members who were willing to have the team measure soybean losses in the field. Former University of Illinois graduate student Marin Skidmore explored the soy supply chain and described incentives for minimizing postharvest loss in her thesis, which was awarded the outstanding master's thesis in the agricultural and consumer economics department.

In February 2018, Arends-Kuenning will visit Cooperativa Lar with a team from the Universidade Estadual do Oeste do Paraná to give a report about the findings of the study and discuss future research directions. Next year, Arends-Kuenning's team will analyze the data collected through the surveys, and extend the study to the southwest area of Paraná in 2018.



## Farmer Decision Making Study in Mato Grosso

Dr. Altair Moura, Federal University of Viçosa, Brazil, is continuing work on an ongoing ADMI-funded project focusing on understanding soybean farmers' decision-making process regarding the soybean-corn rotation system. This project will involve interviews with farmers that use the "safrinha" (interim harvest) to produce multiple crops in a single season in the state of Mato Grosso, Brazil.



## Solar Power



University of Illinois researcher Dr. Bruce Elliott-Litchfield is developing an integrated stored solar dryer and cooker. The goal is to find an economical and environmentally-friendly solution to cooking and drying for smallholder farmers. Testing has been done in Haiti and Cambodia utilizing a commonly available household dryer, the Nesco Gardenmaster. Lab results demonstrated that the stored heat in Litchfield's solar vessel (Sun Bucket) is sufficient to dry food. Adapting the Sun Bucket for use with the BAU-STR Dryer is under consideration.

## RESEARCHER SPOTLIGHT



MATTHEW STASIEWICZ

Dr. Matthew Stasiewicz, an assistant professor of food microbiology, was drawn to postharvest loss prevention by a desire to ensure maximum nutritional value in cereal grains people eat. Through travel and research he learned that while those who are hungry waste very little food, the food they eat is often neither plentiful nor nutritious.

Stasiewicz hopes his work can improve the quantity and quality of the food that is available. His current work focuses on maize kernel sorting to identify and reject grain affected by mycotoxins. Often only a few contaminated kernels can ruin a whole batch, so removing the affected kernels can save a considerable amount of acceptable grain.

He is working to apply mycotoxin identification technology in Texas, Guatemala, and Nepal, and to develop grain sorters appropriate for these locations.

## Information Technology Interventions to Address Postharvest Loss



Researchers John Hart and Dr. Narendra Ahuja have developed a digital Grain Quality Measurement Kit, which will provide farmers with a simple, portable way to test grain. The kit records data on moisture content, relative humidity, and temperature that can be uploaded via a cellular network to a central portal. Hart and Ahuja hope to develop a system that provides accurate technical and market information to assist smallholder farmers to attract and negotiate with grain traders in India.

Based out of the Beckman Institute at the University of Illinois, Hart and Ahuja have employed several students each semester since the project began in 2015, providing them with hands-on engineering experience.





# OUTREACH

## IMPLEMENTING SOLUTIONS FOR POSTHARVEST LOSS

### Implementing Solutions in Bangladesh

Through the PHLIL and with ADMI funding, our colleagues at Bangladesh Agricultural University are moving innovations in drying and storing into the hands of manufacturers, entrepreneurs and farmers.

#### Highlights

- In 2017, postharvest loss prevention trainings were held in 26 villages in 6 rice-growing districts. The training pool included farmers, small entrepreneurs, manufacturers, NGO personnel, researchers, and policy makers. More than 1,600 people were reached in these trainings.
- After BAU successfully piloted the BAU-STR dryer, grain dryers were sold to farmer-entrepreneurs in Comilla, Bangladesh. Owners use them to drying their own farm production and provide custom-hire services.
- Private manufacturers are building BAU-STR dryers in Mymensingh, Bangladesh. All parts are locally manufactured except the blower motor, which must be imported.
- A local company has invested in capacity to produce hermetic bags for rice storage.
- From 2016-2017, 10 workshops were conducted on gender awareness training; these trainings involved 150 participants (70% female) in 8 villages.

### Supporting Women in PHL Prevention

In October 2017, BISA, RPCAU, and the Indian Council of Agricultural Research organized an event at a local Farm Science Center to mark the International Day of Rural Women. BISA's female trainer, Kanchan Rai, led trainings on climate-smart farming systems including demonstrations of the modified STR dryer, hermetic storage bags, moisture meters, zero-energy cooling chambers and solar dryers. Rai was hired by BISA in response to increased demand in the ADMI Village and surrounding communities for trainings for and by women.



# ADMI VILLAGE

## Research and Outreach in Action



### History

In 2015, the ADM Institute launched the ADM Village project together with Dr. Rajendra Prasad Central Agricultural University (RPCAU), the Borlaug Institute for South Asia (BISA) and Bihar Agricultural University. The model village is located in Dih Sarsauna, approximately 70 kilometers from Bihar's capital city, Patna. Fifty-two percent of the villagers are small-scale farmers with less than 0.5 hectares of farmland, while 37% are landless farm workers. The ADM Village serves as a proving ground for postharvest technologies and as a center for trainings and demonstrations. Since 2015, over 6,000 farmers have been trained on postharvest technology use. A few additional activities at the ADM Village are highlighted here.

### Postharvest Loss Technology Centers

2017 saw the launch of 5 technology centers in the ADM Village. Each center is managed by a thoroughly trained lead farmer who is equipped with an STR dryer, generator, moisture meters and hermetic bags. The technology centers provide dryer services to area farmers, distribute hermetic bags and serve as information hubs. The technology center managers include men and women who are becoming effective agro-entrepreneurs.

### Subsidized Bag Distribution

In February 2017, ADM began a program of subsidized distribution of more than 21,150 hermetic storage bags at the ADM Village and 30 nearby communities. The program gives farmers access to up to 5 hermetic storage bags at the price of 20 rupees each, a discount of more than 75% of the market price of 90 rupees. The funds generated from the bag sales finance purchases of additional storage bags to continue the program until farmers become willing to pay the market price. Farmers who purchased the hermetic bags reported increased revenue of more than 400 rupees per year and have avoided pesticide costs and crop loss associated with the use of jute bags.

### BISA ADM Dryer

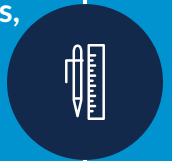
In March 2017, BISA unveiled a mobile bed dryer in association with the ADM Village. The dryer is built on a set of wheels and tilts horizontally to attach to a tractor for travel. A diesel engine provides the heat for the dryer, while the grain loader is powered by a 2 horsepower motor and the blower is operated by a 5 HP motor. The mobile dryer can run 1 ton of grain per shift and completes a shift in 1 to 2 hours, depending on initial moisture content. The dryer's combination of capacity and ease of transport is promising for smallholder farmers and custom hire service providers alike. The dryer has been piloted in Bihari villages and demonstrated for the Bihar government. BISA is engaging in discussions with the state about an agricultural subsidy program to would support large-scale local production of mobile dryers.

### Postharvest Loss Technology Centers



**One Training Center** where extension services are provided to over 5,000 farmers

**Five Technology Centers**, each equipped with STR dryer, generator, moisture meters, mills & hermetic storage bags



**Ninety-Five Percent** seed germination rate using the ADM Grain Handling System, a 60% increase from traditional methods







Photo Credit: International Food Policy Research Institute

# BUILDING CAPACITY

EMPOWERING PEOPLE TO ADDRESS PHL SUSTAINABLY

## Bangladesh Integrated Food Policy Research Program

Farmers in Bangladesh produce more than 30 million tons of rice annually to meet the needs of the 161 million people living in the country, making the nation roughly self-sufficient in its staple crop. The government of Bangladesh maintains storage capacity of over 1.6 million tons of rice to ensure the poorest people in Bangladesh have access to food and that rice will be available in the event of natural disasters or other disruptions. Most of this rice is stored in jute bags in warehouses that lack moisture and temperature control. Each year almost 3 million tons of rice passes through these warehouses for distribution in markets or through the country's social welfare system.

The government of Bangladesh, with financing from the World Bank, is launching the Modern Food Storage Project to address the losses and inefficiencies resulting from the current system of storage and distribution. The project is making massive investments to replace the system of grain depots with state-of-the-art silos that will increase the total storage capacity to 3 million metric tons and minimize storage losses.

To support sound investment of resources and optimal management of new facilities, ADMI, in partnership with the International Food Policy Research Institute and the Bangladesh Institute of Development Studies, is implementing the Bangladesh Integrated Food Policy Research Program. This 4 year project, funded by the Bangladesh government and launched in December 2016, includes training workshops for Bangladeshi policy makers and civil servants responsible for implementing or developing food policies. The work also includes surveys of grain warehouse managers and millers in order to better understand the existing rice value chain. University of Illinois faculty have participated in 2 trainings in Dhaka already. Beginning in the summer of 2018, ADMI will hold month-long short courses at Illinois for program participants from Bangladesh, and ADMI experts will join the participants in conducting timely economic analysis to inform food policy in Bangladesh. Through this work, ADMI hopes to build capacity for food policy analysis that will result in increased efficiency and reduced loss in the Bangladeshi rice system.

# Post-Harvest Loss Reduction Laboratory at Bangladesh Agricultural University



On December 11, 2017, ADMI Director Dr. Alex Winter-Nelson cut the ribbon to inaugurate the new Post-Harvest Loss Reduction Lab at Bangladesh Agricultural University (BAU). The lab, sponsored by the ADM Institute, will serve as a research and training center to help identify PHL problems and solutions. BAU will use the space to facilitate trainings on the use of dryers, moisture meters, mycotoxin detection kits and other technologies for students and professionals.

The lab includes 3 components: one for drying technologies, one for storage technologies, and one for mycotoxin analysis. Prior to the establishment of these facilities, it was difficult to conduct reliable mycotoxin detection and measurement work in Bangladesh, which impeded the ability to understand and address quality deterioration under alternative drying and storage technologies. PHL researchers at BAU will be more able to apply their expertise to address pressing PHL questions with these new facilities. The impact of the lab will extend beyond Bangladesh as our colleagues at BAU collaborate with other partners around the world.

# Disrupting Food Logistics Workshop

The ADM Institute was a co-sponsor of the December 2016 Forum for the Future workshop, Disrupting Food Logistics, in Singapore. The workshop brought private companies and citizens together to learn about issues of food loss and food waste. ADMI representatives took advantage of this opportunity to meet with global players and develop partnerships for future collaborative postharvest loss work in Asia. The publication *Disrupting Food Logistics*, published in mid-2017 and available on the ADMI website, summarizes the workshop and other related research.



Read the publication  
[go.illinois.edu/logistics](http://go.illinois.edu/logistics)

# Capacity Building at Agricultural Business Centers in Sierra Leone

ADMI sponsored a project at Njala University, Sierra Leone, to study rice postharvest operations at Agricultural Business Centers (ABC) and assess their sustainability. These centers form a critical link in the agricultural value chain by supplying inputs to farmers and providing access to mechanized services for tilling, threshing and milling, as well as assisting with market access. The project is also providing hands-on training and field exposure for four postharvest technology master's students at Njala. In January 2017, a group of students from the University of Illinois traveled to Njala University to participate in a Learning IN Community Field Course (LINC) to study and support the ABCs. Through LINC, students from Illinois and Njala jointly take semester-length courses on international agribusiness, trade and development. Students visited and evaluated Agricultural Business Centers located throughout Sierra Leone. At the end of the course, students developed case studies which were distributed to both public and private organizations to provide insight on what constitutes a successful Agricultural Business Center. The ABC-based postharvest loss project is led by Dr. Joseph Sherman Kamara of Njala University.

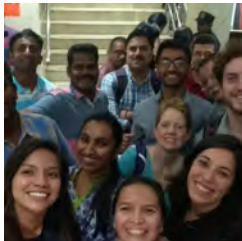




# Marketplace Literacy and Student-Driven Postharvest Loss Solutions



For 12 years, Dr. Madhu Viswanathan of the University of Illinois has been introducing students to the reality of marketplaces in developing countries. Each group of students serves as consultants to marketplace participants, offering practical and scalable solutions to real world problems. For the past several years, ADMI has partnered with the Subsistence Marketplace class to identify emerging solutions in postharvest loss prevention.



Viswanathan and his students take a bottom-up approach to solving problems. The 2017-2018 PHL team started by conducting virtual interviews with farmers to talk about challenges they face and to develop concepts for solutions. Then the students traveled to India to see how well their ideas held up to realities on the ground. This was a humbling and educational experience. “We found that the [postharvest loss] problem is not as simple as we thought,” the team wrote in a collective response. “We learned that one-size-fits-all approach will

not work. We have just completed our field visits and have gathered new insights. This will perhaps need us to rethink our proposed interventions.”

Viswanathan knows from experience that students’ solutions are likely to be incomplete, but he prefers to let the people and the marketplaces be the teachers. “I let the students figure it out for themselves,” he said. The class dovetails with Viswanathan’s larger Subsistence Marketplaces Initiative, which takes bottom-up approaches to poverty and marketplaces and puts them into reality.



## Developing Next-Generation Researchers

### ADMI Summer Internship

The ADMI Summer Internship program continues for the fifth year. Our 2017 intern was Gabby Walker, a student in Food Science and Human Nutrition. During her internship, Gabby completed a comprehensive benchmarking project, examining all of the organizations and institutes working in the field of PHL.

### Graduate Degree Training in PHL

ADMI is contributing to training the next generation of PHL scholars and scientists through various programs and projects. The graphic below summarizes students graduating in 2017 or 2018 with degrees supported by ADMI.

### Postharvest Loss Scholars

**NEW!** ADMI is accepting applications for the first cohort of Postharvest Loss Scholars at the University of Illinois at Urbana-Champaign. Up to three students will be selected to receive graduate research assistantship support for up to two years. Students must have planned or ongoing research related to the prevention of postharvest loss directly relevant to issues in Africa, Latin America, or South Asia.

**Bangladesh Agricultural University**  
Field: Agricultural Engineering  
Degree: PhD  
Number graduating: 3

**Bangladesh Agricultural University**  
Field: Farm Power & Machinery  
Degree: MS  
Number graduating: 5

**University of Illinois**  
Field: Agricultural & Applied Economics  
Degree: PhD  
Number graduating: 3

**University of Illinois**  
Field: Agricultural & Applied Economics  
Degree: MS  
Number graduating: 2

# ADMI

ADM Institute  
for the Prevention of  
Postharvest Loss

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