It is wonderful to be here in China at this global forum to share information focused on the elimination of hunger and poverty through agricultural science and technology.

The challenges before us remain daunting, in spite of all the knowledge and experience accumulated in the development field over the years.

Populations will continue to rise, growing conditions will change, and we will never have more land or fresh water than we do today.

But as gatherings like this one demonstrate, we have many reasons for optimism. That is especially so when we collaborate with other institutions, organizations, agencies, and most importantly, local partners.
Michigan State University, through our partnerships, research, and development activities, fully embraces the aims and ideals we are gathered today to reaffirm.

I’d like to thank our hosts at the Chinese Academy of Agricultural Sciences. And I want to acknowledge The Consultative Group on International Agricultural Research (CGIAR) and the FAO—Michigan State shares complementary missions and a record of successful collaboration with both.
MSU has been pleased over the years to be able to partner with the Academy of Agricultural Sciences on a number of agricultural research and scholarly programs, including several focused on food safety.
About 10 years ago, we also worked together to find potatoes resistant to late blight, and visited your potato breeding program in Beijing.

MSU recently partnered with the FAO and others in the 2015 conference that produced the Rome Declaration for Sustainable Inland Fisheries.

We created an ongoing relationship wherein our students can take courses from the FAO, and our campus can host its visiting scholars.

Michigan State is pleased to have similar partnerships with Consultative Group (CGIAR), which is leading to impactful advances in plant sciences and food security.
MSU is a public, global research-intensive institution with deep experience in agricultural and environmental practice. Water and food are among our core areas of focus.

With our founding in 1855, Michigan State became a model for what became America’s system of land grant colleges and universities—instutions dedicated to the common good.
Michigan State in the 21st century embraces what I call the World-Grant Ideal. A university in this model sees the individual practitioner—wherever they are in the world—not just as the beneficiary of its knowledge, but also as a partner in the creation.

Partnerships are a key element here, co-creating knowledge not just among academic disciplines or higher education institutions, but with diverse other stakeholders. Those can include communities and policy makers in any number of settings anywhere in the world.
The World-Grant Ideal recognizes that fundamental issues unfolding in one’s own backyard link directly to challenges occurring throughout the world.

We believe that this approach unlocks much of the promise of science and technology to find solutions to global problems.

We follow that principle in the global networks we are forming with regional partners, including the Alliance for African Partnerships and the Asian Hub.

In the Asian Hub model, we are building key partnerships around the topics of food, water, energy, and livelihoods of diverse socioeconomic environments.
I’m pleased to report that MSU is solidifying our relationship with Nanjing Agricultural University. Earlier this year our two universities agreed to deepen our relationship with new research and educational partnerships in the coming years.

Under the leadership of MSU and NAU, the Asian Hub in NAU will become a key player in collaborative research in the region. Scientists will work together to tackle the most urgent challenges that the world is facing today on water, food and energy. The research outcomes and problem solutions will not only benefit Asia but other regions in the world.

Such partnerships not only strengthen our respective organizations, but lead to multi-lateral engagements that magnify our impact along strategic regional corridors and in priority countries.

We see the evolution of north-south and south-south partnerships as being essential to address the complex challenges posed by the food, water, and energy nexus.
There can be little doubt that continued innovation is critical to feed a growing global population amidst challenges that threaten food systems, including climate change and rapid urbanization.

MSU has long been active in working with partners in China and elsewhere in Asia on responses to food productivity challenges and, most recently, on scientific solutions to the public health issue of mosquito control.
With our Chinese research colleagues, MSU faculty members such as Jianguo "Jack" Liu today are helping us understand the very complex relationships between human and natural habitats.
I want to turn now to Africa as another region in great need of partners.

Michigan State sees the continent as an important region for focus, not just because we’ve been working there for generations. The region truly has made great strides toward poverty reduction in the last decade or so.

Michigan State’s agricultural researchers view Africa as of increasing importance to global agri-food systems as it confronts its own growth pressures.
Farming is still the primary source of employment for 65 percent of the region’s population, and the 500 million people who depend on farming for their livelihood there will have a big impact on growth of the rest of the continent’s economy.

Remember that few, if any, places have ever really transformed from an agrarian economy to a low-poverty, modern one, without sustained agricultural productivity growth.
The challenge facing us, then, is to increase capacity for food production to handle population growth in Africa from 12 percent of today’s world population to 22 percent by 2050.

Further, more than 60 percent of Africans are between ages 15 and 35, and each year, more than 11 million enter the work force. More young Africans will enter the job market by 2035—about 350 million—than there are people in the United States!

A vibrant, growing agricultural sector could very well influence the rate of youth employment and thus its impact on social and political conditions in the region.

Agricultural solutions, however, are impacted by other issues in play.
Africa’s educational infrastructure hasn’t kept pace with the need for more instructors and facilities to educate the rapidly growing work force.

Its governments also haven’t matched the investment in research and development in food systems that we’ve seen in Asia, where food security has made greater strides.

Clearly, developing regions including Africa need our partnership to increase the capacity of their educational institutions as well as that of their agricultural systems.
MSU embraces the efforts behind this conference to develop greater scientific capacity to meet Africa’s— and the world’s— food challenges.

We realize that adequate investment in science and technology are fundamental to achieving world food security, that complementary investments in agricultural extension are crucial, and that universities and organizations such as the Chinese Academy of Agricultural Sciences must play an active role.
So in Africa and elsewhere, MSU researchers are working directly with farmers, policy makers, government entities, and research institutions to increase agricultural productivity, improve diets, and build stronger value chains and greater community resilience.

Our agricultural researchers realized fairly early in our own history that an effective extension and outreach component is absolutely necessary to move discoveries out of the laboratory and into the field.
It requires a lot of adaptive experimentation, and genuine partnerships with growers to optimize technology for local growing conditions.

In that spirit, MSU researchers and partners are identifying ways to improve seed development, fertilization, and crop rotation to increase yields of key crops all over the world.
Our projects focus on sustainable approaches to improve yields, such as integrated pest management for cowpeas in West Africa, introducing drought-tolerant and disease-resistant beans in Rwanda, and improving soil fertility through legume crop rotation in Malawi and Tanzania.

Faculty members are also informing policies and promoting effective government strategies that encourage sustainable farming—methods that intensify production while improving environmental quality and helping African farmers become more productive and food secure.
In Africa’s agricultural sector, we believe that the application of mobile technology holds great promise in such relatively “unwired” regions.

We all know that farmland growing conditions can vary widely in their need for fertilizer and other inputs, but farmers in developing nations often don’t have the resources to analyze samples.
One of Michigan State’s laboratories, working with USAID and the McKnight Foundation as well as Malawian farmers, is applying and evaluating relatively inexpensive hand-held field testing devices it developed.

Mobile or web applications can then analyze the findings and the information can be transmitted to online data bases.

This promises not only to help farmers improve land management practices, but contribute to the global knowledge base of emerging disease and pest outbreaks, and to invite global collaborations.
To introduce the new technology, our researchers worked closely with research stations in Malawi and with smallholder farms.

The initial training was promising, but data collection quickly ground to halt once farmers were left by themselves. We learned that the Internet infrastructure was weak there, and that users needed something more than remote customer support from America.

So we hired a graduate student in Malawi as a “data entrepreneur” to work with the users to collect and load data.

That technology is now being used by Malawian researchers to find solutions in crop breeding, to help determine which seeds to plant, and for crop management among small land holders.

It’s a great example of moving technology from the laboratory to the user in a very remote setting.
In a similar fashion, our integrated pest management partnerships in Kyrgyzstan and neighboring nations in Central Asia are helping them re-establish their agricultural industries after the collapse of the Soviet Union.

MSU faculty members partnered with local researchers and farmers to help move them out of their heavy dependence on chemicals and to develop a more sustainable industry.
When I spoke to the FAO inland fisheries conference in Rome in 2015, I mentioned former Irish president and UN High Commissioner for Human Rights Mary Robinson.

President Robinson reminded us that, “You can’t solve hunger merely by agricultural interventions alone.”

Michigan State has learned from nearly 160 years of agricultural research and a half century of international work that it isn’t enough to rely only on breakthroughs in science and technology to make a long-term difference in stemming poverty and hunger.
We must adapt our science and technology to be relevant in the local context. Adapting it not only to the physical environment, that is, but also to the social environment—accounting for differences in things such as soils and micro-climates, language, history, culture, religious beliefs, political systems, and regulatory environments.

Without accurate assessments of the context in which agricultural production, hunger, and poverty occur, any solutions risk failure. Our experience with the mobile technology in Malawi is a good example of how MSU had to revisit our initial assumptions.

We also find this concept in play in MSU’s work to add micronutrients into crop varieties. If the crops look or taste different to people, they might not be eaten or planted.

Food distribution systems also merit our attention, and collaborative solutions. One MSU program brings students from a variety of academic disciplines to communities in Africa to study barriers that their markets face in helping vendors sell their products.
Student researchers under the guidance of principal investigators not only map out the physical layout of these markets, but the economic and social networks in play.
Today there is broader understanding that technical approaches are only part of any sustainable solution. We need these kinds of integrated approaches that leverage the social sciences to help us understand the cultural context of food consumers and producers, and their preferences.

We also need efficient, robust, and secure agricultural supply and value chains, from the field to the fork. We need to ensure the safety of food supplies to protect consumers’ health and confidence in the market.
And we need economists, political scientists, and sociologists who understand the social, economic, and political contexts that surround hunger and poverty to make a sustainable difference in how we address them.

Finally, we believe that cooperative application of all of our knowledge and experience for food security can become a more powerful force that can bring the world closer together.
I want to thank our hosts once again for inviting me to join you today, and I look forward to collaborating with you to apply cutting-edge agricultural science and technology to the global problems of hunger and poverty.