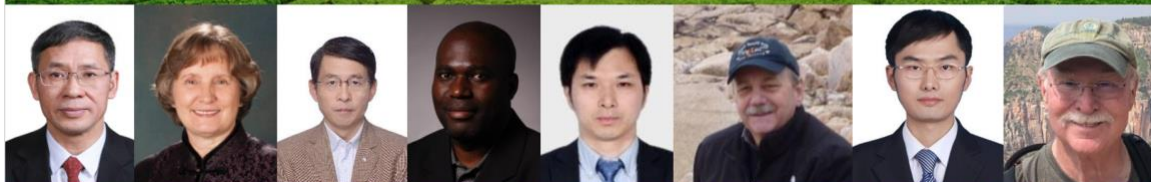




# **U.S.-China Agriculture Deep Dive** **Rural Development**

November 1-2, 2021



**Organized by**

United States Heartland China Association (USHCA)

Rural Development Institute (RDI)  
Chinese Academy of Social Sciences

Bureau of International Cooperation (BIC)  
Chinese Academy of Social Sciences

## Executive Summary

Over the course of two days, leading scholars and practitioners from China and the United States came together for a virtual deep dive exploration of rural development. In total, 16 presenters explored four key topics:

- Rural Revitalization and Development Strategies
- Evolution of Urban-Rural Relations
- Education of a Modern Agricultural Workforce and Agricultural Production Transformation
- New Agriculture Industry Models to Increase the Share of Benefits for Farmers in the Agriculture Industry

Presentations covered a variety of issues, including the development of China's "digital villages," the importance of U.S. land-grant universities, innovative solutions for rural wastewater treatment, carbon peaking and neutralization vis-à-vis rural economic development, and opportunities for U.S.-China collaboration in Africa.

Through the 16 presentations and discussions that followed, several themes emerged.

First, human and investment capital are critical to the transformation of rural areas.

Fundamental to human capital development is a robust education system that begins early with programs like 4H and integrates community colleges, four-year institutions, and extension services along with local industries and business communities.

Fundamental to investment capital and problem solving within the economic ecosystem is collaboration between governments, universities and the private sector. Second, integrated urban-rural development can reverse the growing gap between urban and rural areas and make for healthy agriculture and rural development. It allows for integration of agricultural and industrial supply chains across rural-urban areas, which provides supplemental jobs for farmers and better integrates public goods and services, including infrastructure, technology, health and education. Finally, these presentations and discussions demonstrate that there is vast opportunity for shared learning and collaborative projects—in economic development, higher education, and the private sector—between the United States, China and the world. While there are many challenges, there are more reasons for optimism.

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Bureau of International Cooperation, Chinese Academy of Social Sciences

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Dr. WEI Houkai, Professor and Director General  
Rural Development Institute, Chinese Academy of Social Sciences

#### *Environmental Infrastructure in Rural America*

Dr. Karen Mancl, Professor of Food, Agricultural and Biological Engineering  
Ohio State University

#### *Thoughts on Promoting Rural Ecological Rejuvenation in the New Development Stage*

Dr. YU Fawen, Professor and Head of Ecological Economy Research Division  
Rural Development Institute, Chinese Academy of Social Sciences

#### *Rural Revitalization and Development Strategies: Structural Differences across Countries and Implications for Rural Development in Africa*

Dr. Stephan Tubene, Associate Professor of Agricultural Economics  
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### **Topic 2: Evolution of Urban-Rural Relations**

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Dr. JIN Shuqin, Professor and Director<sup>[SEP]</sup>  
Research Center for Rural Economy, Ministry of Agriculture and Rural Affairs

#### *Rural Society through a Social-Demographic Lens*

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Cornell University

#### *The Evolution Process, Obstacles in Integration and Supporting Policies of China's Urban-Rural Relations*

Dr. NIAN Meng, Associate Professor and Head of Urban and Rural Relations  
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#### *A Very Brief Overview of U.S. Rural Development Policies*

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President Rob Denson, President  
Des Moines Area Community College

*Urban-Rural Population Distribution and Rural Development: International Experience and China's Difficulties*

Dr. DANG Guoying, Senior Professor  
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National Teaching Center of Simulation in Agriculture and Forestry Management,  
Beijing Forestry University

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Lee Strom, Partner  
Open Prairie Rural Opportunities Fund, LP

*China's Digital Villages and Rural Revitalization*

Dr. HU Bingchuan, Professor and Head of Agricultural Trade and Policies

Research Division  
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*Rural Opportunity Initiative Scholars Program*

Matthew McKenna, Executive in Residence McDonough School of Business  
Georgetown University

**Day 1, November 1, 2021**

**Topic 1: Rural Revitalization and Development Strategies**

Moderator: Dr. YE Hailin, Deputy Director General

Bureau of International Cooperation, Chinese Academy of Social Sciences

*Implementation Achievements of China's Rural Revitalization Strategy*

Dr. WEI Houkai, Professor and Director General

Rural Development Institute, Chinese Academy of Social Sciences

Dr. Wei gave an overview of the *Rural Revitalization Strategy* (乡村振兴战略), including its inception and progress-to-date. The strategy stems from the 2005 task of “building a new socialist countryside” (建设社会主义新农村), which focused on developing advanced agricultural production and improving livelihoods for rural residents. In 2017, President Xi Jinping proposed the *Rural Revitalization Strategy (RRS)*, which closely mirrors the 2005 effort. Its overarching goal is to modernize agriculture and rural areas. In 2018, the *No.1 Central Document* laid out the road map for the RRS:

- 2020: make substantial progress on rural revitalization, and establish an institutional framework and policy system;
- 2035: make decisive progress on rural revitalization, and achieve basic modernization of agriculture and rural areas;
- 2050: meet all targets to achieve rural revitalization, including establishing modernized agriculture, a beautiful countryside, and prosperous farmers.

In June 2018, the *Rural Revitalization Strategic Plan (2018-2022)* 《乡村振兴战略规划（2018-2022年）》 identified specific five-year targets, including nine projects, three actions, and three plans. In 2019, the State Council released *Opinions Concerning Establishing and Improving the Institution, Mechanism, and Policy System for Urban and Rural Integrated Development* 《关于建立健全城乡融合发展体制机制和政策体系的意见》, which promotes integrated development between urban and rural areas, such as shared public services, infrastructure, and economic development. Then in April 2021, the National People's Congress Standing Committee passed the *Law on the Promotion of Rural Revitalization* 《乡村振兴促进法》 to legally enforce the RRS. Spending on rural revitalization has increased almost 10% over the last three years and

China also achieved its 2020 poverty eradication target to ensure that rural residents have sufficient food and clothing, as well as access to compulsory education, basic medical services and safe housing. Dr. Wei concluded that with the institutional framework and policy systems in place, the RRS 2020 goal has been achieved and that China is poised to attain agricultural and rural modernization by 2035.

#### *Environmental Infrastructure in Rural America*

Dr. Karen Mancl, Professor of Food, Agricultural and Biological Engineering  
Ohio State University

Dr. Mancl presented how rural America addresses rural water pollution. Water pollution issues rose to national consciousness in the 1960s when Lake Erie was turned into a gigantic cesspool and the Cuyahoga River oozed rather than flowed due to industrial waste. The result was the Water Pollution Control Law, passed in 1972, which aimed to eliminate the discharge of pollutants to national waters. That led to the high-tech, high-energy, and high-cost sewer systems we have today. But how do rural communities with different circumstances and fewer resources address water pollution? Mancl suggests the solution is decentralized treatment near the source of pollution with trained operators and varied technology—not expensive sewer systems. These solutions allow for reuse of wastewater for irrigation, requires significantly fewer resources, and can operate with low technology and low energy. They also do not require highly-skilled operators, but do lead to additional job opportunities in rural areas. This approach to rural wastewater treatment is already being tested and deployed in parts of rural China in collaboration with local universities. See [SETLL.osu.edu](http://SETLL.osu.edu) for more information.

#### *Thoughts on Promoting Rural Ecological Rejuvenation in the New Development Stage*

Dr. YU Fawen, Professor and Head of Ecological Economy Research Division  
Rural Development Institute, Chinese Academy of Social Sciences

Dr. Yu identified the main problems in rural ecological revitalization, as well as progress addressing them and strategies for moving forward. President Xi Jinping's goals of carbon peaking by 2030 and carbon neutrality by 2060 require a greening of rural economic development, or rural ecological revitalization, which requires attention to environmental protection, agricultural production, and living environments. Environmental protection involves safeguarding our water resources, farmland, forests and grassland. Most pressing is that we must increase the fertility of our farmland and stop the conversion of farmland to non-agricultural practices. Regarding agricultural production, China needs to reduce the use of chemical fertilizers and pesticides, and address issues with livestock and poultry waste, straw disposal, and plastic waste. Use of chemical fertilizers has started to decrease, but application intensity is still 1.61 times higher than the international recognized upper limit for safety. Pesticides have also seen a slight reduction. But both chemical fertilizers and pesticides continue to see increased use on China's three primary food crops. The livestock and poultry industries continue to grow while the effective treatment rate of animal waste is below 50%. Straw yields

are also increasing, but it is used less and less for food, fuel or fertilization so surpluses are often burned. Plastic waste from pesticides and mulch film are also a pressing issue, yet current solutions such as recycling or developing biodegradable alternatives are not economical, so the problem persists. Finally, rural living environments face challenges with sewage and household waste. We are seeing progress in these areas, with an increase in number of towns and villages able to treat sewage and address trash locally, including sorting. Eighty percent of rural areas now have sanitary toilets that can safely discharge waste into the soil—a huge improvement. Challenges in rural ecological revitalization do persist, however, including: insufficient funding, China’s sheer size and varied geography, and poor maintenance and management of infrastructure. In order to address these, we must strengthen Chinese Communist Party leadership, strengthen institutional mechanisms such as policy and regulation, improve human resources, and increase funding.

*Rural Revitalization and Development Strategies: Structural Differences across Countries and Implications for Rural Development in Africa*

Dr. Stephan Tubene, Associate Professor of Agricultural Economics  
University of Maryland Eastern Shore

Dr. Tubene gave an overview of the extension system in the U.S. and the rest of the world and also provided suggestions for U.S.-China engagement in Africa. The U.S. extension system emerged gradually after acts in 1862 and 1890 created land-grant universities. These schools—like all others—did research and teaching, but also had a third critical component of extension: to bring non-formal education to farmers and other residents of rural communities. The extension system receives federal funding through various agencies, including the U.S. Department of Agriculture, the Farm Service Agency, and the National Institute of Food and Agriculture, as well as state funding through land-grant universities. One primary difference between this structure and rest-of-the-world extension systems is that, while the former features deep integration between extensions and institutions of higher education, the latter features and political and bureaucratic cleavage between the two. This is because extension systems in the rest of the world are under Ministries of Agriculture and institutions of higher education, such as agricultural colleges, are under Ministries of Education. Another difference is that U.S. extensions feature a mix of federal and state funding, rest-of-the-world extensions are centrally funded under Ministries of Agriculture and therefore feature a remarkable shortage of funds. In terms of U.S.-China engagement in Africa, Dr. Tubene suggested both countries are engaging Africa for the primary purpose of securing natural resources. Instead, according to U.S. Ambassador Ray, the U.S. should see Africa as an adjunct to the U.S. high-tech and service sectors. The U.S. and China should also not force Africa into choosing *either/or* between the two powers, rather they should work collaboratively in Africa. Dr. Tubene advocated that China and the U.S. could collaborate to bring extension services and their tripartite mission to Africa. He called on the U.S. and China to approach Africa as partners, not patrons, and to focus on jobs, health, infrastructure and education.

## **Q&A, Day 1, Topic 1:**

*Q. “Dr. Mancl, who funds the rural water treatment systems you described?”*

MANCL: In the U.S., most of the funding comes from local governments. That’s why it’s important to *not* take the expensive urban systems and shrink them down for rural use. Ohio State University has developed treatment systems specifically for rural U.S. and China that are inexpensive to build and operate (SETLL.osu.edu).

*Q. “Dr. Mancl, who monitors the rural water treatment systems and what are the standards for water reuse?”*

MANCL: The trained operator is responsible for monitoring water quality and reporting it to the state every month. Wastewater reuse has three outlets: agriculture, areas not accessible to the public, and public access areas such as parks and sports complexes. Each outlet has different standards for reuse. Public access has the highest standards to avoid odors and people getting sick, whereas reuse for agriculture has much less stringent requirements due to no public exposure.

*Q. “Does the Chinese government have any plans for agriculture projects with African countries or research centers?”*

WEI: In recent years the Chinese government has done some collaborative projects with African countries in rural development and agriculture. Specifically, projects on agriculture technology dissemination, extension programs, and seed varieties have been well received and successful. We could add rural wastewater treatment projects to our list of collaboration. One of our biggest challenges in rural China is treating rural wastewater. I have visited the United States and Europe to see how they do this well. Perhaps, China, the U.S., and Europe can collaborate to build up wastewater treatment systems in rural Africa.

TUBENE: 1890 land-grant institutions are working with researchers at universities and research centers on food security as well as plant and animal protection and disease prevention. We have focused our work in Kenya, Ghana, Democratic Republic of the Congo, and Cote d’Ivoire, but would love to see more collaboration with China in agriculture.

*Q. “What is the future of smallholder farmers in China? And what role do they play in building a more sustainable ecological food system in China?”*

WEI: In China, smallholder farmers are defined as farmers with less than 10 *mu* (1.65 acres) of land—a slightly lower standard than the World Bank’s definition. The majority



of Chinese smallholder farmers actually have only 7-8 *mu*. The government has led many initiatives to link smallholder farmers into the modern agriculture system. The Chinese government's key task is to integrate them into the modern agriculture system. By centralization of the land, we can better manage the land and improve the area for production. With the support of professional agriculture services, smallholder farmers can operate the land in a better, more scientific way.

*Q. "Dr. Tubene, what is the definition of 'small farm' in the U.S., and what are the megatrends in terms of how these small farms will develop in the future?"*

TUBENE: Technically, if you produce \$100 worth of product in the U.S. then you're a farmer. Most farmers have less than 10 acres of land, but they of course produce much less than the large-scale farming operations. These small farms don't produce traditional crops such as wheat, corn or soybeans; rather, they focus on specialty crops such as hot peppers for niche markets in nearby cities.

## Topic 2: Evolution of Urban-Rural Relations

### *Promotion of Carbon Peaking and Neutralization, and Rural Revitalization*

Dr. JIN Shuqin, Professor and Director<sup>[1]</sup><sub>[SEP]</sub>

Research Center for Rural Economy, Ministry of Agriculture and Rural Affairs

In September 2020, President Xi Jinping announced to the United Nations General Assembly that China aimed to achieve carbon emission peak before 2030 and carbon neutrality before 2060. Rural areas represent a very small share of carbon emissions, but are still an important component of achieving these goals. Carbon emissions have had three phases in rural areas:

- 1961-1978: Stable growth in carbon emissions
- 1979-1996: Rapid increase in carbon emissions due to economic reforms and increased productivity
- 1997-2018: Increased carbon emissions due to energy consumption, then a decrease of emissions the last three years due to reduced use of chemical fertilizers and pesticides

Primary contributors to carbon emissions in rural areas are crop planting, livestock breeding and machinery energy consumption—each constituting roughly one-third. Energy consumption continues to trend upward and must be the focus of efforts.

Several challenges remain:

- Farmers' incomes must increase while also greening agricultural practices.
- A carbon emissions baseline is undefined by province or industry, and increasingly unclear at city and township levels where implementation happens.
- People don't understand the issue, terminology, or what needs to happen.
- Officials respond in two extremes, either pushing forward energy-intensive projects to take advantage of the "window of opportunity" before new restrictions kick in, or implementing in the extreme by restricting or turning off electricity and harming normal economic activity.

China will not achieve these goals in all industries, in all regions, all at one time: there is no one-size-fits-all solution. It took developing countries a long time to achieve carbon peaking and China will learn from them, but China is also still developing. Rural China must focus on improving production and farmer incomes while reducing carbon emissions. It will identify metrics for success, actively develop carbon markets, speed up research, and adopt the right techniques and technology. And rural China will utilize low-carbon efforts to drive rural green transformation by reducing agricultural inputs, re-purposing waste, and revolutionizing feeding methods.

### *Rural Society through a Social-Demographic Lens*

Dr. David Brown, International Professor of Development Sociology, Emeritus  
Cornell University

Dr. Brown introduced how a social demographer would view rural society. First, he established that population change impacts the well being of rural and urban

communities. In the U.S. for example, the rural population has remained roughly 46 million since 2000—constant in absolute terms, but a decreasing proportion of the total population (from 20% in 2000 to 14% in 2019). Changes in population composition—not just size—are equally important to community well being and can be “demographic deficits” or “dividends” to their communities. An ageing population, for example, can bring strain on a social services system, or bring robust pensions to retirement communities. Income sources, education and family structures all influence the dividend-deficit nature of these changes. So we see that population matters, but demography is not destiny. Population changes affect social and economic changes directly, but also indirectly, and can be mediated by institutions. In fact, the same population changes can have different outcomes in different communities, depending on political will, social salience, and available resources. That is to say, rural areas are diverse and there is no one-size-fits-all solution to rural issues—either in the U.S. or China. Finally, Dr. Brown rejects the rural-urban binary. Rather, the *rural + urban* view suggests a dynamic interface between the two and that the boundary that divides also brings together. Human activities flow across these boundaries, including labor markets, waste management and food ecosystems. Government also extends beyond urban-rural boundaries, including land, water and wildlife management, which raises the question: Is regional governance democratic? If governing multiple places in a regional way, are regional governments responsive to the populations they govern? In place-by-place governance, there is a direct relationship with the governed, but at a regional level, such as the rural-urban interface, there remains a challenge to provide democratic governance.

### *The Evolution Process, Obstacles in Integration and Supporting Policies of China's Urban-Rural Relations*

Dr. NIAN Meng, Associate Professor and Head of Urban and Rural Relations  
Research Division  
Rural Development Institute, Chinese Academy of Social Sciences

Dr. Nian presented an overview of the development of urban-rural relations in China, key challenges, and suggested policies. Urban-rural relations are defined by three critical time periods:

- 1949-1978: Efforts focused on the establishment of the People’s Republic of China and developing industrial capabilities, with a strong rural-urban divide.
- 1979-2002: Reform and Opening led to dramatic economic growth and a growing gap between urban and rural China.
- 2002-present: China entered the first phase of a well-off society and first made concerted efforts to resolve the development gap between urban and rural areas.

During this last phase, the previous binary approach to rural-urban dynamics was discarded in favor of “integrated urban-rural development,” as put forth in the 19th CPC Congress report. Despite this shift in efforts, there are still many challenges to integrated urban-rural development. First, there is still a growing gap between urban

and rural incomes. In 2020, urban incomes were on average 2.5 times higher than rural ones. The household registration system also presents a challenge. There exist extremely high barriers to entry for rural residents—predominantly poorly educated farmers or migrants—to settle in urban areas. There is a wide gap in public services, with the government spending twice the amount on urban residents, and rural residents essentially locked out of accessing services in urban areas. Finally, prominent problems in rural areas inhibit long-term sustainable development. Examples include rural demographic trends such as ageing population, left-behind children, and abandoned villages. The poor living environment, including low treatment rate of wastewater and sewage, is also a limiting factor. Policies that could address these issues are four-fold:

1. Form a unified urban-rural factor market, including labor, land (“same land, same rights, same price”) and financial access.
2. Accelerate the “citizenization” of rural residents into urban areas by reforming the household registration system and improving cost-sharing mechanisms between central and local governments, businesses, and the floating population.
3. Balance the governance, planning and management systems between urban and rural areas so they are not separate or preferential.
4. Continuously increase farmers’ incomes, in particular legally allowing them to monetize their land value.

#### *A Very Brief Overview of U.S. Rural Development Policies*

Dr. Lou Swanson, Professor of Sociology, Emeritus, and Vice President for Engagement, Emeritus  
Colorado State University

Dr. Swanson provided an overview of U.S. rural development policies. First, the history of rural America’s social and economic development has been uneven, with several regions characterized by persistent poverty, such as the Mississippi River Delta, the Appalachian Mountain Range and Native American reservations. Second, persistent poverty is, in part, because the U.S. federal government does not have a set of comprehensive rural economic and social development policies. The important exceptions to this are U.S. Farm and Food policies as well as environmental and natural resource policies through the U.S. Department of Agriculture (USDA) and the Environmental Protection Agency. However, the federal government does manage important physical infrastructure grant programs for the nation’s rural areas, such as USDA’s Rural Development service that, among many services, provides grant funding for transportation, water and wastewater for rural areas. Third, due to the decentralized political structure in the U.S., community and economic development initiatives in rural areas tend to be the responsibility of each of the 50 states. These initiatives depend on available resources and the support of each state and local governments. As a result, low-income regions struggle to eliminate persistent poverty and there is great variation among states in their approach to rural development. Fourth, institutions of higher education— specifically U.S. land grant colleges and Universities—are primary rural

development institutions and have been critical to state and local government development strategies. There are three types of land grant institutions:

- 1) 1862 Land Grant Universities
- 2) 1890 Land Grant Universities (Historically African American LGUs)
- 3) 1994 Land Grant Colleges (Historically Native American LGCs)

Their joint mission is to bring university talent and resources to the communities they serve. LGUs also feature Agricultural Experiment Stations and university-based extension services that have been the primary institutions for the development and transfer of new agricultural technologies to farmers and rancher. Finally, China's agricultural universities and U.S. land grant universities have begun collaboration on transforming university extensions. The *Sino-U.S. Alliance on University-based Agricultural Extension* was established in 2017 and there is much these two countries can learn from one another and do together for the benefit of rural development globally.

### **Q&A, Day 1, Topic 2:**

*Q. China's ageing population and rate of urbanization have led to ghost villages. Did this trend exist early in the United States' urbanization process? If so, how did you address it?*

BROWN: In China, many workers move to cities and leave their children in the village with grandparents. This was never the case in the U.S. Regarding ageing demographics, however, poverty among the older population was always much higher than for young people until the 1940s when the U.S. passed the Social Security Act. This provided a basic pension for the elderly and reversed the trend, such that there is a higher rate of poverty among working-age people than the elderly. Subsidized health insurance for the elderly, known as Medicare, builds upon that.

*Q. What is the percentage of U.S. urban residents moving to rural areas?*

BROWN: There are very few urban residents moving to rural areas in the U.S. In the U.K., there is a substantial number of people moving from urban to rural areas due to a positive view of rural life and an idealized "rural idyll." But in the U.S. in general this does not happen, with the exception of older people in retirement migration moving for amenities, not for employment.

*Q. What are China's plans over the next 20 years, starting with the latest five-year plan, to begin to manage the balance between persistent poverty and rapid transformation of the agriculture sector?*

WEI: We have detailed plans in the 14<sup>th</sup> Five-year Plan to solidify our achievements in poverty eradication and achieve the full modernization of agriculture. Currently underway is the three-year action plan of the rural revitalization strategy and a five-year action plan is in the works (2021-2025). Many efforts, regulations and policies are

pushing forward this plan. Absolute poverty has been eliminated, but how do we address relative poverty? How do we even define it and what is our timeline to address it? We will solidify our achievement in poverty eradication and pave the way for further progress moving forward with the “common prosperity” agenda. We also need to address urban poverty and develop a unified standard across China. We are still doing our research.

*Q. What are the main reasons for the urban-rural gap and how do we address it?*

SWANSON: Rapid industrialization in the southeast U.S. between 1900 and 1935 provided non-farm employment, which softened the loss of farms. Even today, small farms get 90% of their income from elsewhere, so off-farm income and employment opportunities are allowing these farms to maintain operation. In fact, there is an interesting increase in small-scale operations because they can do direct marketing and are supported by consumers in their area. This rural-urban interface is also happening in Anhui Province, China, where urban residents are interested in high-quality food directly produced in their area. These fields of study like rural sociology and agriculture economics present significant potential for U.S.-China cooperation.

*Q. What's the average education level of American farmers and what does the government do to improve their education levels?*

BROWN: There is not much difference between farmer education levels and education attainment of the overall U.S. population. Most farmers have at minimum a high school education if not one or two years beyond. Most are not necessarily poor farmers. Most—especially small-scale farmers—combine farm and off-farm work, so they likely need additional education for their non-farm employment.

*Q. What is the effect of AI on agriculture and farmers? And what are the trends of AI application in this field?*

SWANSON: AI is very important for large operations. Some extraordinarily large operations may be family farms, but what's important is that they are using minimum tillage or no-till technologies, and have machinery to apply herbicide such that they are reducing amounts used. They have better fallow systems, hybrid seeds, higher productivity, machinery substitution, and land-saving technologies. And they save huge amounts of labor. Today, the amount of labor necessary to produce a bushel of wheat is much less than in the 1930s. Drones now look for soil moisture and search for invasive weeds. AI technology is very important for commercial operations, but less so for small operators, particularly along the urban-rural interface.

## DAY 2, November 2, 2021

### Topic 3: Education of a Modern Agricultural Workforce and Agricultural Production Transformation

Moderator: Dr. KuoRay Mao, Associate Professor of Sociology, Colorado State University

#### *Rural Revitalization Fully Depends on Building Human Capital in Rural China*

Dr. PANG Xiaopeng, Professor

School of Agriculture Economics and Rural Development, Renmin University

China needs a high-caliber workforce for all parts of the economy. In the agriculture sector, China has over 212 million workers, which is a disproportionate percentage of the population (27.7%) compared to South Korea (4.8%), Japan, (3.5%) or the U.S. (1.45%). But China's agricultural productivity is 4% that of the U.S. and education levels are also low. Only 8% of the agriculture labor force have a high school education or above, compared to 87% in the U.S. So, education and training for farmers is high priority. Several government initiatives have been implemented since 2005, including two national training programs in 2019 and 2020, several online efforts during COVID, and the *Building on Human Capital in Rural Revitalization Act* 《乡村振兴促进法》, which includes farmer education and incentivizing city-to-village migration of human resources. China is facing many challenges in building human capital in the agriculture sector. Funding sources are limited, teachers are in short supply, and the quality of courses varies. Most pressing is the question of how China can develop future farmers and utilize technology in order to achieve modernization of agriculture, rural revitalization and common prosperity. To address these challenges, it is critical that we first enhance education programs for youth in both rural and urban China. We should have more agriculture-related courses in our curriculum and train children to love nature and appreciate rural areas. 4H in the U.S. is a good example of this. Higher education is also critical to maximizing success in rural development. Land grant universities and university-based extension services are great examples of how to do this well. China will learn from these examples and hope for opportunity to collaborate between the two sides.

#### *Colleges Can Help Revitalize Rural Communities*

President Rob Denson, President

Des Moines Area Community College

The community college system in the U.S. successfully prepares the population for work in agriculture or any other industry. It is a great partnership between the federal government, states and local communities. There are over 1,000 community colleges in the U.S., and Iowa alone—a relatively small state of 3 million people—has 15 community colleges. These serve many students who also work or receive federal support to finance their college education. Programs offer what students needs and

what employers want, whether credit-degree programs or non-credit certificates. In particular, community colleges are excellent at providing training for local manufacturing or agriculture needs. Our mission at Des Moines Area Community College (DMACC) is to provide quality, affordable student-centered education and training to empower our diverse communities and to serve as a catalyst for economic development. And key to DMACC's success has been developing education centers within easy commuting distance of every citizen in our district. It offers over 230 certificates, diplomas and degrees and last year it served over 70,000 students, about half for degrees and half for certificates. Many come for the first two years of a four-year degree, and many high school students enroll in our programs as well. Also key to DMACC's success is having businesses that want to hire students out of its programs, so all of its programs are managed by a group of companies that do so. It partners with Facebook, Microsoft, and Tyson Foods. DMACC's new automotive technology building is a good example of providing high-tech opportunities to students that prepare them for increasingly automated industries. The college also hosts the Future Farmers of America leadership center to train young farmer-leaders to be successful on their farms and be active in business and industry. DMACC has a large agriculture program, including agribusiness, agronomy, farm management, animal science and sustainable agriculture. It also has a 162-hectare college farm with cattle, swine, alfalfa hay, corn and soybeans so students can learn with their hands. And the college hosts many seminars, government officials and industry leaders on campus. Finally, Forbes magazine just named DMACC the best employer in the state of Iowa—the only state with a community college as number one.

*Urban-Rural Population Distribution and Rural Development: International Experience and China's Difficulties*

Dr. DANG Guoying, Senior Professor

Rural Development Institute, Chinese Academy of Social Sciences

Dr. Dang explained how urban-rural population distribution affects rural development and highlighted challenges for China as well as policy recommendations. The rural economy is an integrated system of which field agriculture—farms and pastures—is only one aspect. The population size and density of towns are key indicators of healthy, integrated rural economic development, and there is a high correlation—though not necessarily causation—between the population density of town centers and the value-added output per area in agriculture. So, Dang concludes that China should focus its efforts on developing high-quality township economies. Boosting incomes is key to accomplishing that task. But to raise incomes, farmers are increasingly in need of part-time jobs for supplemental income close to their farms. Such local part-time employment requires four conditions:

1. non-agricultural jobs near farms
2. processing services in the agricultural industry chain based in rural areas
3. farmers' cooperatives that operate efficiently in the agricultural industry chain
4. a rural population several times larger than the agricultural population



The problem is that these conditions are so inadequate in China that rural residents mainly move to work in other places. Also, China's agricultural industry chain is conducive to cities, but has not adapted to rural areas. There are also challenges in rural access to basic public services due to limited scale and ecological protection requirements. According to analysis of France and the Netherlands, limiting the radius of towns and minimizing sprawl is helpful in improving access to public services. Finally, the United Nations and World Bank recently completed an effort to classify the world population into three areas:

- *City*: population size above 50,000 and density above 1,500/km<sup>2</sup>, half of which is covered by municipal facilities
- *Town and Semi-densely Populated*: population size of 5,000-50,000 and density of 300-1,500/km<sup>2</sup>, less than half of which is covered by municipal facilities
- *Agricultural*: population size below 5,000 and density below 300/km<sup>2</sup>

These divisions, however, are difficult to apply to China's population distribution, in part because some of the rural population migrates to cities for work without moving residency. Only by clarifying China's population distribution can it identify specific objectives for the rural revitalization strategy. If China wants a balanced distribution of towns and high-quality development, it should pursue policies that:

- Establish towns with a radius, generally, of 100-300 km<sup>2</sup>.
- Develop rural towns with small city functions, agricultural service centers, and more links to the agricultural industry chain.
- Achieve a balanced distribution of towns such that farmers can reach towns within half an hour's drive and have access to rural public.

### *Enhancing the Economic Ecosystem: Leveraging Resources and Sectors for Multiple Benefits*

Dr. Glenda Humiston, Vice President  
Agriculture and Natural Resources, University of California

Dr. Humiston asserted that in order to achieve healthy agriculture and rural development there must be collaboration among all sectors, especially government agencies, universities and the private sector. However, complicated issues are complicated to solve, especially across regions. Rather than working in silos or starting from scratch, Humiston's approach has been to identify existing entities working on a problem in a region and gather them together to start identifying synergies and resources that are available yet lacking. Critically, these entities also identify who has access to those missing resources and would be willing bring them to the table. The result is a comprehensive response among partners to an identified need in their shared economic ecosystem (An economic ecosystem includes: Research & Innovation, Workforce & Training, Trade/New Markets, Access to Capital, Infrastructure, Supply Chains). At the University of California (UC), Humiston has agreements with over 300 entities in government, academia, and the private sector to deliver on UC's mission. For example, in response to a federal government request for proposal on manufacturing

communities and innovation, 28 counties in California partnered to form the Central Valley AgPlus Food and Beverage Manufacturing Consortium. There are over 1,600 food and beverage manufacturing companies in the region that span the economic ecosystem. Members are able to find synergies, opportunities and solutions because they talk regularly and in real-time with experts in their respective areas. Working together and leveraging one another's resources allows members to move forward further and faster. Similarly, UC Agriculture and Natural Resources is also partnering with others across the economic ecosystem with the aim of making food and agriculture of the 21st century as efficient, sustainable and equitable as possible. Humiston then provided a sample mapping of opportunities for synergy and leveraging within the food system value chain. For more case studies and worksheets on how to ensure key ingredients of the economic ecosystem are part of others' work, Humiston also strongly recommended the book: *Higher Education Engagement in Economic Development: Foundations for Strategy and Practice*.

### **Q&A, Day 2, Topic 3**

*Q. What lessons can China provide the rest of the world in terms of rural industrial development?*

DANG: Ever since Reform and Opening in the 1980s, China has had township enterprises popping up. Then, once these develop to a certain level they transition into a higher-level cluster of communities like large towns, small cities, or even industrial zones. We see this along the Yangtze River, in the Greater Bay area, and the Pearl River Delta. This clustering and development of township enterprises means the free economy can develop even better.

*Q. At U.S. community colleges, how do you evaluate the benefits of the training and internship courses to ensure that students really develop their skills?*

DENSON: These courses are called work-based learning and are very popular in the U.S., particularly since most of our students need to work to put themselves through school. Our faculty, business consultants and trainers work closely with local companies that hire our students in order to determine the competencies our students can learn on the job. This ensures we know what skills to train them in to make them more useful to the company. For example, we partner with Accumold, a local company that makes micro-gears and tools. They schedule our students for weekend shifts so they can go to school during the week. It's all about satisfying the needs of the businesses so they keep employing our students, who get income and training. And our students are able to contribute to the classroom because they're part of the work force. That's work-based-learning.

*Q. How can community colleges and larger four-year institutions collaborate more to leverage other elements of the economic ecosystem?*

DENISON: DMACC has a joint admissions partnership program with Iowa State University (ISU) where students are jointly admitted, have an advisor at ISU from day one, and develop a clear vision for their entire path through our institutions: two-year degree, then four-year degree, then into the workforce. Our partner four-year universities love our transfer students because we've prepared them to be successful in their four-year degree.

HUMISTON: University of California also has a pathways program from community colleges. But the pipeline starts much earlier, like reaching down to five-year olds with 4H programs, through grade school, high school and then into community colleges. That entire pipeline must be working, especially when we're trying to get young people interested in agricultural fields that aren't seen as lucrative. Our challenge is to convince them there are many, many different types of jobs in that field, not just on the farm, but along the entire supply chain. And they are very good jobs that also make agriculture successful.

*Q. In the U.S., capital and other resources seem to be congregating in the countryside. What is the role of federal and state governments in promoting the concentration of capital and resources in rural America?*

HUMISTON: If we do not get capital into the rural parts of our country, then those communities start fading. Our agriculture, forestry and natural resources industries really need new, expanded, or upgraded manufacturing and supply chain bases, so we need investment capital aimed at those areas in order to make that happen.

DENISON: The governor of Iowa created the Empower Rural Iowa Act, a large initiative that looks community-by-community to help them keep their downtowns vibrant and provide high-speed internet. With the pandemic, our rural communities have filled up again because young people have returned thanks to remote work and our Internet capabilities. And they want their children to grow up in Iowa with our quality education system. So we have focused on making our small towns successful—by developing leaders, growing their manufacturing base, and promoting agricultural production—and we've allocated large amounts of capital to accomplish that.

## **Topic 4: New Agriculture Industry Models to Increase the Share of Benefits for Farmers In the Agriculture Industry**

### *Understanding the Intention to Adopt Information and Communication Technology in Rural Entrepreneurship: An Extended Model of the Technology Acceptance Model (TAM)*

Dr. XUE Yongji, Professor and Executive Director

National Teaching Center of Simulation in Agriculture and Forestry Management,  
Beijing Forestry University

Information and Communication Technology (ICT) has driven innovation, entrepreneurship, and productivity in rural areas as well as increased income and improved livelihoods for rural households. Yet, in China there is still a low adoption rate of ICT in rural entrepreneurship and a dearth of research to explain why. Dr. Xue's study is to identify the major external incentives and internal drivers that motivate ICT adoption in rural entrepreneurship, including the influence of neighbors, policy incentives, perceptions, and industry type. The study was conducted by online questionnaire in Jiangxi due to its strong agriculture and entrepreneurship. Dr. Xue drew three conclusions from the study:

1. The influence of neighbors and policy incentives bear the most and second most influence on ICT adoption, respectively.
2. Perceived ease of use, perceived usefulness, and perceived welfare play a key mediate in the positive relationship between external induction and ICT adoption intention.
3. Perceived ease of use (PEU) to entrepreneurs in the agricultural industry was more likely to be affected by policy incentives; PEU to entrepreneurs in industrial integration entrepreneurship was more vulnerable to the influence of neighbors.

These conclusions have three primary policy implications:

1. Integrate the forces of policy and community; improve the effectiveness of policy supply, and expand the strength of rural organizations.
2. Focus on perceived ease of use to farmer entrepreneurs, with perceived usefulness as the core and perceived welfare as the supplement.
3. Improve the pertinence and strength of external incentives based on industry heterogeneity.

### *Open Prairie Rural Opportunities Fund*

Lee Strom, Partner

Open Prairie Rural Opportunities Fund, LP

Lee Strom is, first, a farmer and, second, a partner in Open Prairies Rural Opportunities Fund, an Illinois-based private equity management firm. During the Bush and Obama administrations, Strom headed up the Farm Credit Administration, which oversees agriculture lending in the U.S. He then returned to Illinois keenly aware that there is a lack of investment in middle America. Tech corridors around San Francisco and Boston have plenty, so young people are leaving rural communities for better opportunities in

the big cities. With Open Prairies, he now focuses on bringing more capital to rural America. Open Prairies has invested slightly over \$51 million into 13 companies—12 of them based in the heartland—all in towns with less than 50,000 people. The companies range in focus from agriculture inputs, production or processing of agriculture products, and information and logistics. And they evaluate companies by the United Nations’ Sustainable Development Goals and ESG factors. Open Prairies’ investment has fueled revenue growth, job growth, and the attraction of an additional \$110 million in outside investment. Strom gave the example of a Wisconsin seed company that used Open Prairies’ investment to acquire another seed company and research new varieties of organic alfalfa with higher protein. Their revenue has grown 210%, their number of employees has increased seven times, and now another investment company has invested in their company. Access to equity and debt capital is absolutely critical for businesses in rural communities. It provides young people with better job opportunities and higher incomes, and it helps rural communities thrive.

### *China's Digital Villages and Rural Revitalization*

Dr. HU Bingchuan, Professor and Head of Agricultural Trade and Policies  
Research Division  
Rural Development Institute, Chinese Academy of Social Sciences

Dr. Hu explains the origins of and initial progress on China’s *Digital Rural Development Strategy*. The Chinese Communist Party Central Committee and State Council released a package of policies in January 2018 outlining the *Rural Revitalization Strategy*. The goals were to, by 2020, establish an institutional framework and policy system, by 2035, to achieve basic modernization of agriculture and rural areas, and, by 2050, to establish modernized agriculture, a beautiful countryside, and prosperous farmers. In May 2019 top leadership issued *Outline of Digital Rural Development Strategy*, which supports the rural revitalization strategy. Finally, the 14th Five-Year Plan, released March 2021, proposed a “Digital China”—to significantly narrow the urban-rural digital divide, achieved through five tasks:

1. Rural digital infrastructure construction
2. Development and management of rural data resources
3. Rural digital industrialization
4. Digitalization of rural industry
5. Digitalization of rural governance

Initial progress is being made. 4G coverage in rural China exceeds 98%, and the rural digital economy is developing rapidly, including e-commerce and intelligent agricultural production. The “Internet + government services” campaign, which strives to improve efficiency and data sharing, has now extended to the countryside. By 2025, the effort aims to expand access to 5G, telemedicine, distance education and other digitalized services. It will establish new technology entrepreneurship and innovation centers for new farmers to assist with business incubation, technological innovation and skills training. It will also continue to focus on e-commerce, smart rural logistics, and rural digital governance. By 2035, the plan aims to modernize agriculture and rural

governance, improve farmers' digital literacy, and provide equal access to basic public services, whether in cities or rural areas.

### *Rural Opportunity Initiative Scholars Program*

Matthew McKenna, Executive in Residence McDonough School of Business  
Georgetown University

The Rural Opportunity Initiative (ROI) Scholars Program is part of the Business for Impact center at Georgetown University's McDonough School of Business. Its mission is to develop educational excellence and experiences in its business students to pursue sustainable rural economic development. ROI promotes investment in rural America through programming, internships, research, partnerships, and advocacy. The initiative works around the country in rural geographies and with partner businesses and organizations to build capacity, infrastructure, and alignment between investors, lenders and local communities. Both America and China need more investment in rural communities. And in fact, there is no lack of funds; what is lacking is communication between rural opportunities and the investment community. Georgetown's MBA program also features the Scholars Program that places students in externships with industry practitioners in the ROI network to develop a talent pipeline for the rural economy. Participants contribute research and written work as thought leaders in the rural economy. They also join professional development, networking and mentorship opportunities because it's so critical that they be connected to the economic partners that can drive this development. McKenna concluded that there is a gap between the high demand of students to work in rural opportunities and discovering the actual jobs that exist in those fields. Economic development demands professional development, job opportunities and students to go make their homes and work in these rural areas.

### **Q&A, Day 2, Topic 4:**

*Q. Where do the funds come from and how do you manage the investment risk and return in the agricultural sector?*

STROM: Funds come from the private sector, as with any other private equity company. Open Prairie has a proven track record in private equity for 25 years. Our partners span the food and agriculture industries, so we do deep dive due diligence on all companies that we invest in, then we manage risk as any other private equity company would.

*Q. How do farmers benefit from China's digital villages?*

HU: We want to cultivate a new generation of farmers through the digital transformation of China. That is the digital economy. For example, for financing opportunities, we often do an evaluation in a single day. A farmer with a few pigs or several hundred chickens, we can do a quick evaluation of their credit in one day, and then approve them for a 50,000 microloan.

*Q. What is the status of “digital villages” in the U.S.? How is digital access affecting the development of agriculture in rural America?*

STROM: Rural broadband and access to digital is incredibly important. There are still vast areas that are underserved. This is extremely important for businesses—they must have access to the digital age and economy to survive. We are collecting vast amounts of data and that digital knowledge is being used more and more, and more efficiently everyday by everyone, including suppliers in the supply chain and creditors. A producer can apply for credit online and sometimes get a response in just five minutes—a line of credit for even \$1 million dollars. But that all depends on broadband access.

McKENNA: Broadband development in the U.S. is mixed. Some rural areas are well connected, while others are not. We recognize the need and we’re trying to fulfill that need through a combination of federal and private resources. The federal government has recently passed legislation to invest in expanding broadband in those areas, and the private sector is also very involved.

*Q. How has digital and information technology impacted agricultural commodity and value chains in the U.S.?*

STROM: It has had a tremendous impact. Consumers are demanding more and more information about their food. For the companies that we evaluate, the ones that can access, utilize and assess digital information to help their businesses grow are the ones that succeed. That’s a key element as we consider which companies to include in our portfolio. Of the 13 of them, four are operating digital platforms. And as costs continue to rise and margins get thinner and thinner, utilizing this information gets more and more important.

*Q. What are suggestions to improve China’s rural farm productivity so that agribusinesses can generate profit?*

STROM: The U.S. has consolidated its agriculture industry in the last five decades. But smaller producers pursuing niche markets are seeing growing demand for organic products and are able to enjoy wider margins for those products. For example, an organic seed company in Open Prairie’s portfolio is meeting demand for organic alfalfa that is fed to cows that produce organic milk. Smaller producers can do well in those markets compared to larger commodity-type producers.

## **Final Reflections:**

### *Comparative discussion of insights on U.S.-China approaches to development*

Dr. Lou Swanson

Professor of Sociology, Emeritus, and Vice President for Engagement, Emeritus  
Colorado State University

Two themes have run consistently through these two days of presentations: the importance of investment and the necessity of collaboration. Rural areas in China and the U.S. need capital investment and, critically, funding must be market-focused and, ideally, a collaboration between government and the private sector. Historically, the U.S. and China both face uneven development between urban and rural areas. Humiston's model of the economic ecosystem ties together well how government and the private sector must collaborate to solve these challenges. But herein lies the divergence between the U.S. and China: the former is a federal, decentralized system, and the latter is a much more centralized system. They both, however, highlight the importance of education in rectifying these challenges, through youth programs like 4H, quality high school education, applied education at community colleges, and land-grant universities and extension services. Consistent among our presenters is also a great deal of optimism. Agriculture has been changing rapidly since the 1950s and there is plenty of opportunity for pessimism about rural-urban polarization and key challenges; however, the solutions put forth by this group give us reason to be optimistic. There is so much opportunity for collaboration in the private sector, higher education and economic development. Bringing these two countries together in collaboration is exactly the purpose of the U.S. Heartland China Association and this event.

Dr. PANG Xiaopeng

Professor, School of Agriculture Economics and Rural Development  
Renmin University

Human capital is the most dynamic and critical factor for successful rural revitalization and rural governance. We need high caliber people in rural education and development. This symposium serves as helpful reference of opportunities for learning. One key takeaway is the importance of youth education, which is critical for long-term prosperity in the countryside. China's education is focused on helping students leave the countryside. But China must help young students develop a passion for nature, like the 4H program in the United States does. Another key takeaway is the importance of leveraging higher education institutions to advance education in agriculture. In the U.S., local colleges and universities make significant contributions to local rural economic development, including sending many talents to many sectors. Teacher training and higher education in agriculture for farmers present great opportunity for collaboration. This symposium demonstrates that there are many opportunities for collaboration in this space. Early in China's development, it adopted the Soviet model. As China has grown stronger, it has transitioned into a hybrid model of Soviet, U.S. and other foreign



practices. Further exploration of successful models is critical to success, so China will refer closely to other countries' practices in revitalizing rural areas. U.S.-China collaboration will bring more opportunities to our rural communities.

### **Closing Remarks**

Dr. DU Zhixiong  
Deputy Director General  
Rural Development Institute, Chinese Academy of Social Sciences

"The Sino-U.S. Agricultural Roundtable Forum: In-depth Rural Development Exchange Seminar" was hosted by the United States Heartland China Association as well as the Rural Development Institute and the Bureau of International Cooperation—both within the Chinese Academy of Social Sciences. Over the past two days, the symposium has focused on the theme of "Rural Revitalization and Development in China and the United States" and explored four key topics:

1. Rural Revitalization and Development Strategies
2. Evolution of Urban-Rural Relations
3. Education of a Modern Agricultural Workforce and Agricultural Production Transformation
4. New Agriculture Industry Models to Increase the Share of Benefits for Farmers In the Agriculture Industry

Sixteen scholars from China and the United States published their research findings and insights at the meeting, from which I have gained many new insights. Two takeaways stand out in particular: First, over the past ten years, China's agricultural and rural development has made great progress, whether measured by infrastructure conditions, the income and welfare of rural residents, or the appearance of the countryside. Yet, in China, the agriculture industry, rural areas and farmers are all still lagging behind relative to non-agricultural industries in manufacturing and service industries, relative to urban areas, and relative to urban residents. This shortcoming is not only a problem that China's overall modernization needs to solve, but it is also the reason why China has repeatedly emphasized that it is the world's largest developing country. It is precisely for this reason that China proposed and officially implemented the *Rural Revitalization Strategy* in 2017. In 2021, China will win the battle against poverty (after solving absolute rural poverty according to Chinese standards) and will comprehensively promote the *Rural Revitalization Strategy*—an important action for the integrated development of urban and rural areas. We believe that with great efforts, China's agriculture will become stronger, rural areas will become more beautiful, and farmers will become richer.

Second, in the process of modernization, despite differences in the history and development conditions of various countries, all countries—especially developing countries—are at different stages of development. This common phenomenon of development is also why we can learn from each other and share development

experience. From the sharing of our American friends at this forum, it is clear that the United States, as a country of immigrants in the New World, does not have the extreme differences between its urban and rural areas or between workers and farmers that we do in our Eastern countries. But throughout its rural development, the United States has also experienced rural ageing, relatively low agricultural efficiency, rural population migration, and economic decline. As a developed country, the United States has many experiences in rural development governance to solve the above problems: the agricultural extension system, rural community construction, driving growth through market expansion, rural development funds and investment companies directing capital to the countryside, integrated urban-rural governance and development, and rural human capital investment, to name a few. China is also encountering these issues in the implementation of its *Rural Revitalization Strategy*, so from the Chinese side it is worth giving great attention to learning from these experiences. In fact, if we take a closer look at how China and the United States promote rural development, we see that while some of our specific practices may differ, the direction of our efforts and our approach to problem solving are very similar. For example, while the government attaches great importance to increasing budget input in rural areas, it should introduce industrial and commercial private capital and financial capital into rural areas, and introduce talents such as resident cadres, volunteer teachers, and rural community service volunteers to rural areas. The issues covered in this forum were extensive and the insights that stemmed from the discussions were very profound. These are merely my observations and takeaways regarding these two aspects.

I would also like to emphasize that the exchanges between Chinese and American scholars like ours in this forum, whether in form or content, are important for promoting mutual understanding between scholars, for informing public discourse, and for promoting rural prosperity and development. It is very useful and I hope this kind of in-depth bilateral dialogue and exchange will continue. Finally, I would like to take this opportunity to express my admiration and gratitude to Ambassador Kenneth Quinn's proposal to host this forum a year ago. And to the U.S. Heartland China Association, the International Bureau of the Chinese Academy of Social Sciences, and my colleagues inside and outside the institute, I would like to express my heartfelt thanks for the efforts extended to make this forum a success. I look forward to seeing you again in the coming year!