



RURAL DEVELOPMENT AND FOOD SECURITY FORUM 2019 HIGHLIGHTS AND TAKEAWAYS

DECEMBER 2020

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6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 8632 4444; Fax +63 2 8636 2444.
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Notes:

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Abbreviations

ADB	Asian Development Bank
CO ₂	carbon dioxide
COVID-19	coronavirus disease
DMC	developing member country
FAO	Food and Agriculture Organization of the United Nations
FPC	farmer producer company
FPO	farmer producer organization
GMS	Greater Mekong Subregion
ICT	information and communication technology
IFPRI	International Food Policy Research Institute
IoT	Internet of Things
IRRI	International Rice Research Institute
M&E	monitoring and evaluation
NGO	nongovernment organization
OECD	Organisation for Economic Co-operation and Development
PRC	People's Republic of China
RDFS	Rural Development and Food Security
SDG	Sustainable Development Goal



Sharing best practices. The Rural Development and Food Security Forum served as venue to discuss how to address the farming crisis and malnutrition, and learn about transformative technologies for rural prosperity.

Introduction

The Asian Development Bank (ADB), partnering with the International Food Policy Research Institute (IFPRI) and the International Rice Research Institute, hosted the 2019 Rural Development and Food Security (RDFS) Forum,¹ with the theme “Transformative Changes for Rural Prosperity and Nutritious Food” on 28–30 October 2020 at the ADB headquarters in Manila, Philippines. More than 350 participants, including officials from ADB’s developing member countries (DMCs), multilateral organizations, academics, farmers, and youth attended the forum. The RDFS Forum 2019 was a call to action for DMC governments to provide leadership to generate rural prosperity and effective stewardship of land and water (fresh and marine) resources to provide sufficient, safe, nutritious, and affordable food.

ADB’s new corporate Strategy 2030 promotes rural development and food security as one of its seven operational priorities. ADB will incorporate climate-smart technologies and enabling policies into its operations; catalyze public and private sector investments for rural development; and promote transformative changes to make farming profitable, gender-responsive, highly productive, and attractive to youth. ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. In 2019, ADB committed \$21.64 billion in loans and grants to support our DMCs. ADB’s Strategy 2030, which is aligned with the global Sustainable Development Goals (SDGs), calls for urgent attention to meeting the challenges of poverty, food insecurity, and rural prosperity in Asia and the Pacific region.

The RDFS Forum 2019 aimed to:

- (i) share and learn best practices, recent trends, and innovations;
- (ii) strategize on how to scale up innovations; and
- (iii) identify ways to strengthen cross-institutional and cross-sector synergies, networks, and partnerships.

¹ The discussions presented in this report took place on 28–30 October 2019. This summary reflects the key issues of the pre-coronavirus disease (COVID-19) food system and has limited coverage on the pandemic impacts on the system and pathways to achieve the Sustainable Development Goals (SDGs).

With the theme “Transformative Changes for Rural Prosperity and Nutritious Food,” the discussions focused on three issues:

- (i) farming crisis, with emphasis on transforming unprofitable farming to profitable farming with livable incomes by strengthening agricultural supply and value chains;
- (ii) malnutrition that still significantly impacts Asia and the Pacific, with emphasis on meeting the malnutrition and food safety challenges to achieve ADB’s Strategy 2030 and commitments to SDGs, particularly SDG 2: Zero Hunger;² and
- (iii) transformative policies and technologies for rural prosperity that help overcome structural constraints. These include small farm size and holdings and poor physical and market infrastructure. Policies and technologies that focus on rural prosperity enable rural areas to become spaces of economic development, give impetus to growth, modernized agriculture, and nonfarm goods and services.

The forum outcome and outputs will inform the implementation of ADB’s Strategy 2030 OP5: Operational Plan for Rural Development and Food Security, 2019–2024. ADB’s Strategy 2030 calls for renewed focus of ADB operations in three areas:

- **accelerated rural development** to focus on improved rural services, increased private sector investments, and more jobs in the rural areas;
- **efficient agricultural value chains** to produce and distribute food efficiently from farms to consumers, reduce postharvest losses, improve farmers’ profitability, and provide sufficient, safe, nutritious, and affordable food; and
- **resilient food systems** to ensure food security by sustainably producing more with less resources while addressing malnutrition, and nature-based green recovery effectively combined with climate-smart practices.

The forum had eight plenary sessions. There were no breakout sessions because all the topics are important for all participants to attend, reflect on, and propose the way forward. Information and communication technology (ICT) in the form of the Event App was used to engage participants in real time. Participants used it to ask questions and share insights and recommendations. This Highlights and Takeaways report documents key messages from the RDFs Forum 2019.

The COVID-19 pandemic in early 2020 will have profound impacts on the development and investment planning priorities and approaches. Not all implications of the COVID-19 pandemic on agriculture, food security, and rural development

² Nearly 392.3 million people were severely food insecure in Asia during 2017–2019, while 303.5 million alone were from South Asia. Women aged 15–49 years that met the Minimum Dietary Diversity for Women – MDD-W during the same period were 50% in Nepal and 80% Tajikistan. Globally, less than one in three children aged 6–23 months (29%) met the minimum dietary diversity; the same share in South Asia accounts for 20%. Also see Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children’s Fund (UNICEF), United Nations World Food Programme (WFP), and World Health Organization (WHO). 2020. [The State of Food Security and Nutrition in the World 2020: Transforming Food Systems for Affordable Healthy Diets](#). Rome, FAO.

are yet fully understood and further studies are needed. However, a few points of significance in a post-COVID-19 era include:

- Food security of the urban poor, and daily laborers in particular, is suffering a severe blow due to the pandemic. This needs urgent attention as urban poor, migrant labor, and self-reliant microentrepreneurs (hawkers, petty traders, street vendors) need a minimum intake of nutritious food to survive. They now face disruptions in production supply and distribution chains. These are the most vulnerable groups of the population that need targeted and efficient measures to enhance food security. This has to be independent of what they may earn as daily wages have been wiped out under lockdown situations. There is great uncertainty about these sources of livelihoods reemerging sufficiently in a post-2020 period. ADB has provided unconditional cash transfers and in-kind support to the poor and vulnerable. Emergency assistance during the pandemic included strengthening public health preparedness, procurement of medical equipment, and supplies and medicine.
- Smallholders are the other major vulnerable group, who in the pre-COVID-19 period were already facing existential problems due to high production costs, price volatilities, and climate change-exacerbated droughts and floods. During the pandemic, and in the post-2020 period, smallholders will continue to have limited access to credit, markets, and assured buying prices of the intermediaries or wholesale brokers. It is important to revisit the suggestion of a minimum farmer income for small and marginal farmers to survive in times of crises and enable them to continue to produce for their own consumption and the markets. It is important to note that pre-COVID-19, remittances (domestic and foreign) provided a major safety net for the rural poor in times of crises. The COVID-19 pandemic, however, led to a sharp drop in remittances. Global remittances are projected to decline sharply by about 20% in 2020 due to the economic crisis induced by the COVID-19 pandemic and shutdown. Flows are expected to fall across all regions, most notably in Europe and Central Asia (27.5%), South Asia (22.1%), and East Asia and the Pacific (13%).³
- The COVID-19 pandemic has brought into sharp focus the issues of inefficient markets. The needs of smallholders for basic market infrastructure (hard and soft), including storage facilities to secure short-, medium-, and long-term supply and value chains that can self-isolate and/or self-sustain in times of major disruptions—natural and/or human induced—should be addressed. Many food value chains in DMCs remain informal and lengthy with many handling agents involved, limiting marketable trading volumes, crop quality, and profitability of smallholder farmers. Farmer organizations can play an important role in addressing this structural issue by improving input/output aggregation and empowering smallholders vis-à-vis the supply and value chain transactional actors. Digitization can play an enabling role in facilitating these changes at scale and in a cost-effective manner. Farmer associations and organizations should be provided assistance so that they can establish

³ World Bank. 2020. [World Bank Predicts Sharpest Decline of Remittances in Recent History](#) (No: 2020/175/SPJ). Press Release. April 22.

and manage local market infrastructure such as storage and cold storage facilities. Complementary advisory services on marketing and price volatility management will be critical for smallholders to move toward sustainable livelihoods in the post-2020 era.

- Production and supply of safe and nutritious food are of great importance as avoidance of epidemics and pandemics are intrinsically connected with sale and consumption of safe, nutritious, and quality food. Food safety has become a basic public health and livelihoods issue in both rural and urban areas. Moreover, as the COVID-19 pandemic has disproportionately affected the rural and urban poor, food and nutritional security must be increased, and investments in food safety are a must. This pandemic redefined the food safety challenge. Apart from the safety of food at the point of consumption, other critical factors for maintaining food supply chains are packaging and no-contact delivery, essential food production, and availability of distribution workers. Under the One Health approach, food cold chains and logistics system can in the near future potentially play an important role in the effective distribution of COVID-19 vaccines.
- The COVID-19 pandemic has further exacerbated the pre-existing policy, structural, and market inefficiencies. It is imperative digital technologies are brought to bear to overcome these chronic and persistent constraints. Opportunities for using digital technologies in agriculture, telemedicine, and education (both in terms of working from home as well as remote consultation and teaching via internet) have underlined a post-COVID-19 change in how people in the corporate world and in the health and education sectors may work in the future.
- Post COVID-19, pressure on the rural sector to supply adequate food and nutrition will persist. Despite economy-wide income losses, it is still possible for food demand to remain relatively high due to shifting consumption preference for food (especially nutritious food) compared to non-food items. Hence, policies and strategies should support agricultural finance, technology (including rapid digitalization of value chain), logistics, infrastructure, and transport for a two-way movement of inputs and services and outputs. Investment in data infrastructure may play an important role in improving access to key social services for rural populations. Hence, digital connectivity between urban and rural areas and investments in peri-urban and rural areas are a way forward to reduce the rural–urban divide and distress.



Proactive assistance. President Nakao stressed ADB's commitment to assist DMCs to increase agricultural productivity and profitability, enhance food safety, and improve climate resilience.

Welcome Remarks

Excellencies, Distinguished Guests, Participants, Ladies and Gentlemen:

I am honored to welcome you all to the Rural Development and Food Security Forum 2019. I am encouraged to see strong participation of our member governments, partner agencies, academic and research institutions, the private sector, and civil society. I am particularly pleased to see farmers, especially female farmers and youth from India, Indonesia, Nepal, and the Philippines.

The last time we organized a food security forum was in June 2016. Now with Rural Development and Food Security as one of the seven operational priorities of ADB's Strategy 2030, we need to deepen and accelerate our knowledge-sharing efforts with key stakeholders around the world.

In the last 40 years, the Asia and Pacific region has made tremendous progress in reducing poverty and achieving food security. When ADB opened for business in 1966, agriculture was among its top priorities, since many parts of the region were facing food shortages and even the risk of starvation.

On the poverty front, in 2010, Asia and the Pacific achieved Millennium Development Goal 1 - Eradication of Extreme Poverty and Hunger—5 years ahead of schedule. Extreme poverty, defined as \$1.90 per day threshold, has declined in developing Asia from 69% in 1980 to about 7% in 2015. The agriculture sector has played a pivotal role in delivering these developmental outcomes.

Similarly, the food security situation in the region has shown remarkable improvement in the last 4 decades. Most countries in Asia including Bangladesh and India are self-sufficient in food. This progress was largely driven by the green revolution technologies that put high-yielding seed varieties in the hands of our farmers, accompanied by investments in rural roads and irrigation, and agricultural extension. The region's share in global food production, crops, and livestock has increased.

Despite this great progress, there are still more than 300 million people living below the poverty line. An additional 900 million people who live on less than \$3.20 per day are

constantly at risk of being pushed back into extreme poverty of below \$1.90 per day. Moreover, poverty incidence continues to be higher in rural areas than in urban areas.

In many parts of the region, farmers are unable to make a livable income. Agriculture endures many risks, including weather, diseases, and financial risks. But market risk is the most devastating to farmers' income. Prices of most farming products vary widely within a year, as well as year-on-year. Market infrastructure and related policies and regulatory frameworks in most DMCs require significant improvements.

Cold chain infrastructure is practically nonexistent in most DMCs. This results in postharvest losses of 30%–40%, lowering the quality of produce, and generating worm and bacteria contamination. This issue is especially serious for perishables, such as fruits and vegetables.

The continued inability of farmers to generate a livable income risks rolling back many of the poverty reduction gains we have made in the last 4 decades. Further, extreme weather conditions caused by climate change, and degraded farmland and water resources are making our task of finding sustainable solutions even more difficult.

For its part, ADB will proactively assist its DMCs to increase agricultural productivity and profitability, enhance food safety, and improve climate resilience and sustainability. We are committed to supporting our member countries to supply sufficient, nutritious, safe, and affordable food. People also want higher quality food as their incomes increase. Let me share three innovative examples.

In Uzbekistan, ADB's \$280 million project aims at modernizing the country's horticulture wholesale markets by reducing distribution and marketing costs and increasing agribusiness profitability and farmer incomes.

In Cambodia, the Lao People's Democratic Republic, and Myanmar, ADB's Climate-Friendly Agribusiness Value Chain projects are targeting to boost net incomes of rural households by increasing climate resilience of rural roads and irrigation systems, developing cold chains, and promoting bioenergy and solar energy access for agri-processing.

In the People's Republic of China, the Gansu Internet-Plus Agriculture Development Project is supporting farmers' access to high-value e-commerce markets by developing smartphone applications. The project is also introducing sensors to monitor in real-time temperature, moisture, and soil nutrients for smart farming and to support food traceability.

At this forum, in the coming 3 days, I invite you all to share your expertise and wisdom with us, and of course among yourselves to respond to rural development and food security challenges. I am also looking forward to your views on how ADB can make a better contribution to the needs of farmers and rural communities.

Thank you.

Takehiko Nakao

President, Asian Development Bank

28 October 2019, ADB headquarters, Manila, Philippines



Information and communication technology as an opportunity. Smallholders and rural stakeholders can benefit from using ICT but they will need advisory and user support.

Farming Crisis

Farming has always historically been a very risky business. Farmers today face both the intensification of old risks, and the extensification and expansion of new risks. It begins with questions of land—access to land, land insecurity, ownership; lack of recognition of title; timely access to high-quality inputs—seeds, water, fertilizer; access to labor, which is complicated in all of these economies; access to credit at the right time and at serviceable cost; weather and climate; and volatility and risks brought about by the market. In agriculture today, we have risks at a larger scale than ever before but that they are also highly context specific.

Insecurity of ownership of and access to land across many countries of the Asia and Pacific region remains a continuing challenge. Many farmers still often do not have clean title or access to their land. Those who have ownership rights often struggle to ensure that the title remains updated, and struggle with mutation and passing on that land to other members of their families. Tenants and sharecroppers—a very large proportion of farmers—are also landless farmers. Tenants and sharecroppers struggle to get basic recognition. This affects their ability to access inputs, to access guaranteed minimum support prices for their produce, to access credit that is often in the agricultural context tied to land and the ability to furnish clean title to land and property.

Farmers are also coping with land fragmentation. Land fragmentation is happening both as a result of family sizes, and generational and intergenerational transfers. But there is also the dynamics of land acquisition at work. In addition, farmers are dealing with declining productivity of their land. This a problem related to access to water

Farmers are also consumers. They are not only consumers of the very produce they grow—as they both buy and sell agricultural produce and food; they are also consumers of inputs. As the journalist Harish Damodaran puts it often: farmers buy in retail but sell in wholesale. The terms of their engagement in both input and output markets tend to be poor.

Mekhala Krishnamurthy, Ashoka University, Delhi, India

but also soil quality. Many farmers, especially small and marginal farmers, are also laborers. They work as paid laborers on other people's farms, off-farm labor, and of course also work as unpaid laborers contributing to household labor in a range of activities as part of the production system. A number of farmers are also aggregators or petty commodity traders. These are multiple roles that the farmer plays.

The *Global Food Policy Report* of the International Food Policy Research Institute (IFPRI) for 2019⁴ highlights several crises facing rural areas. Foremost is hunger and malnutrition. It is estimated that there are still 800 million people globally who suffer from hunger, and 2 billion people who lack micronutrients—the so-called hidden hunger. Majority of the hungry are in rural areas despite rapid urbanization. Many of these malnourished people are in Asia and the Pacific region.

The returns on farming are minimal. In many countries, when we examine the farm enterprise budget, the returns are negative. The youth are not interested in farming because it is a backbreaking drudgery and they do not see a reasonable livelihood coming out of farming. There is a steady out-migration of young people to urban areas and farming is left to women and the elderly. In the People's Republic of China (PRC), the Philippines, and Thailand, for example, the average age range of farmers is 56–58 years. At the same time, the youth, even the children of farming families, are lured to urban areas for better opportunities resulting in the aging of farming populations. Aging farmers are a critical challenge to the region's food and nutritional security.

We are simple farmers. We are the ones who till the land, spend for it, we do everything. We grow onions and chili. We borrow money from whichever source we can find so that we have capital for the farm. We buy expensive seeds, fertilizer, and insecticide. But during harvest, people buy it from us at such a low price. What will be our livelihood? We look for additional livelihood; accept any other job we can get. We do not rely on our land anymore. Even our sons seem reluctant to farm because of our bad experience.

Paulina de Afria, Nueva Ecija, Philippines

Governments have underinvested in agriculture; currently, it is estimated that some \$600 billion is going toward subsidizing agriculture production annually—water, fertilizer, and pesticides; the subsidies do not produce healthy and nutritious food and are usually linked to grain production.

⁴ International Food Policy Research Institute (IFPRI). 2019. [Global Food Policy Report](#).



Investing in the future. Session panelists stressed the importance of increasing annual investments in agriculture and rural development to help reduce the number of food insecure people below 5% of the total population by 2030.

Key Takeaways

- **Land rights and consolidation.** Improve ownership and titling; give recognition to tenants and sharecroppers; combat the question of fragmentation and think about land pooling. Geographic information system technology can make land ownership and land use rights transparent and safe for farmers to pool their lands and move from fragmented farms to larger landholdings that are financially viable.
- **Investment opportunities.** To reduce the number of food insecure people below 5% of the total population by 2030, we have to increase annual investments from the current level of \$41 billion to \$78 billion in agricultural research and development, water resource management, and infrastructure to reduce postharvest losses
- **Agriculture can be made more productive and less resource intensive.** The results of the joint research with the International Rice Research Institute in Bangladesh, Cambodia, and Nepal showed that climate-smart practices could increase profits from rice production and make it less material intensive with lower water use, less greenhouse gas emissions, improved labor productivity, increased carbon sinks, and improved soil quality.

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Key Takeaways

- **Farm income support**, which is one of the key elements that governments are turning to as a way to address the crisis in agriculture, is not a substitute for public investment in agriculture and rural development or for other vital forms of social protection. We must think of farm income support as an important complement, not as a band aid to public investment.
- **Information and communication technology as an opportunity.** Villages can be connected through internet and producers can use apps and conduct e-commerce. Smallholders and shops in villages can sell not just agriculture products and food items but also traditional crafts to urban consumers, and even export to foreign countries. Smallholders and rural stakeholders will need advisory and user support to adopt and diffuse information and communication technology.



Role of the private sector. Government investment in market infrastructure development may be between 25% and 30% and the bulk of the investment will come from the private sector.

Dysfunctional Agricultural Markets and Malnutrition

Markets and malnutrition are inextricably linked. While most people in the region can now afford enough food (post COVID-19), this assumption may not hold), there is a sizable population who cannot afford the right kind of diet to meet their basic nutritional requirements. In terms of affordability, a nutritious diet was out of reach for about 20% of people in Cambodia, and up to 68% in Pakistan. Ironically, very often it was in rural areas that nutritious food was most out of reach. For the person in a household who most needs a highly nutritious diet—an adolescent girl or a woman who has just had a baby is nursing or is still pregnant—their diet is the most expensive of all and the hardest to come by.

Malnutrition is a top global challenge. Malnutrition heavily affects Asia and the Pacific region. When we look at the rates of people being overweight, the fastest rise is seen in Southeast Asia and the Pacific. Nearly half of the world's population who experience the double burden of stunting among children under 5 and overweight adult females live in Southeast Asia and the Pacific. The prevalence of the double burden (% stunting, % overweight) is as follows: Philippines (32, 29); Indonesia (36,

Electronic food vouchers for nutritious food

In Cox's Bazaar, Bangladesh, WFP with support from ADB and the Government of Bangladesh, is helping to build a new set of stores where refugees can come and cash in their electronic food voucher. The beauty of that is that they were no longer just giving the people bags of rice, a can of oil, or a couple of lentils but they were able to purchase the food that is most nutritious and most suited to their diet. A good portion of the money that they spend is for purchasing locally grown food by the host community, which has suffered a little bit by the arrival of so many new people and for whom food prices have also gone up a little bit. So with this very helpful partnership, those refugees who arrive with horrific malnutrition problems are able to address their own nutritional needs while supporting the local community.

Anthea Webb, Country Director, World Food Programme, Bangladesh

26); and Papua New Guinea (43, 50). As far as hunger is concerned, it is estimated that globally there are still 822 million people who are still food insecure—517 million of whom live in Asia and the Pacific. The World Health Organization minimum requirement for vegetables is 200 grams (g) per capita per day. The PRC, Japan, the Republic of Korea, and Viet Nam are doing well as they consume more than 200 g per capita per day. In the Philippines, it is 130 g per capita per day; in Bangladesh it is only 57 g of vegetables per capita per day.

Interestingly, rising levels of carbon dioxide (CO₂) will affect human nutrition by decreasing nutrient density of crops and wild plants globally. Zinc, iron, magnesium, and calcium are declining in wheat and the mineral density is declining as well. Elevated CO₂ levels also decrease nutrient density in wild plants, trees, and herbaceous plants. It is a systemic and pervasive effect on nearly all plants globally. As CO₂ concentrations rise and plants accumulate more sugars and starches, these dilute not only minerals but other nutrients. Research also found that B vitamins, such as B1, B2, B5, and B9, declined in essentially all rice cultivars for which data are available. What is worrisome is that data from elevated CO₂ experiments show a significant decline in carotenoid density that protect against oxidative stress and improves vision and memory in humans.

Inefficient markets. While preharvest value chain issues of improving yield, improving crop quality, and protecting crops from pests are production-related issues causing farmer distress, the postharvest segments of the value chain are equally or in many cases even more vulnerable to market and nonmarket disruptions. In a year where there is a crop failure, the farmer is obviously done in. Paradoxically, in a year that has a bumper harvest, the farmer is equally in trouble as prices crash. Postharvest value chain is either broken, or it is in the hands of vested interests, or there is no coordination. Inefficient markets tend to be harsh on farmers, who lose out both as producers and consumers.

Most developing countries do not have sufficient storage and cold chain capacity. In countries where cold chain capacity is adequate, it is not accessible and/or affordable to smallholders. This results in farmers having limited leverage or pricing power. Another area of concern is the inefficient and ineffective markets and agricultural value chains resulting in high postharvest losses. According to a United Nations study, around 42% of fruits and vegetables, and 30% of grains are lost before reaching the consumers. Perishable produce is lost before it can be processed and/or reach the food plate; most of it actually perishes at farmgate.

The conclusions of the four country briefs show that by reducing fruit and vegetable postharvest losses, countries like Bangladesh and Viet Nam can save up to almost \$2 billion every year. This amount is far more than the cost of building modern market infrastructure, which can increase the shelf life of fresh produce and reduce the losses. Price fluctuations of fruits and vegetables in these countries are very high, reflecting inefficient value chains. In 2017, the price of fresh potatoes in Lahore, Pakistan fluctuated by 177%. It was even higher for tomatoes since the price fluctuated by more than 800%. If these countries can moderate these fluctuations and reduce prices by 10%, based on 2018 data, the annual savings in lost revenue will



Fixing the value chain. Session panelists said that we need to fix the value chain inefficiencies to minimize postharvest losses and create attractive profit for producers.

I believe that working in a group such as the Farmer Producer Company is more beneficial than working alone. Working alone as a farmer in India is not possible because India does not have a very strong infrastructure. Here, the single operator approach is not good; the supply chain is not strong. Input materials like the fertilizers that are needed by the farmers are not of good quality, and farmers have to be trained on better techniques etc. After the cultivation is over, our company buys all the produce, packs it and then we export it to Europe.

Amarjit Jagap, Green Horizon Farm, Maharashtra, India

be \$815 million for Bangladesh, \$145 million for Nepal, \$825 million for Pakistan, and \$581 million for Viet Nam.

In many cases, partly decomposed vegetables and fruits are bought by consumers. This has a detrimental effect on their health. Fruits and vegetables are not easily available to low-income consumers, who spend 50%–60% of their household income on food. Unaffordability of fruits and vegetables for low-income groups is a major cause for co-existence of undernourishment and obesity in these population segments.

One of the quickest wins for anyone who wants to get involved is to organize storage and logistics. We are not able to bring the goods where they are needed the most. Come harvest time, there is an oversupply in some areas, there is a drop in prices for those farmers; but other areas need those goods too; and there is poor supply and distribution, and we are not very efficient about it.

Enzo Pinga, Earth Beat, Philippines

Key Takeaways

- **Governments need to be sensitized** to the fact that they lose 1%–2% of gross domestic product by not addressing agri-food market infrastructure (hard and soft). The initial improvement of markets has to be government led. Governments have to provide the enabling policy and regulatory conditions particularly land-related issues, and the private sector role is to drive efficient transactions across the supply and value chains. Public–private partnership has to be a mutually reinforcing and beneficial. By just reducing the postharvest losses, an efficient market infrastructure could add 1%–2% to a country's gross domestic product.
- The **producer or farmer has limited power** on pricing or for holding on to the stock. It is not so much about developing segments of the postharvest value chain, as it is about having an integrated value chain. This will require for example: adequate storage including cold storage capacity; the use need of a digital backbone to provide information in real-time on stock levels and inventory, how much is pledged etc. This would be tied into a banking channel, where the farmer is able to pledge the produce, and against a warehousing receipt collects 20% or 30% of the value of the crop. This information could eventually be aggregated to a national level to provide information on overall commodity or produce stocks and inventories. This could inform policy makers and farmers on the potential future demand for the crop or commodity and allow for adjustments in terms of crop choices and cropping areas, thereby avoiding the boom and bust cycles every 3–4 years. This could also help the governments in maintaining a buffer to hedge against price volatility. For example; if warehouses are full and there is excess stock, one-time export would be in order. On the other hand, if there is insufficient supply and low buffer stock, cropping area decisions for the next growing season could be adjusted accordingly.
- **We need to fix the value chain inefficiencies to minimize postharvest losses.** The agricultural value chains, especially of fruits and vegetables, are most often inefficient. These inefficiencies result in high postharvest losses and fail to generate attractive profits for producers.
- **Governments need to consider addressing structural and market infrastructure deficits** in a coherent and proactive manner to secure food and nutritional security and the Sustainable Development Goals effectively and on schedule. These investments are worth every penny. Most of these investments will not come from government; the role of government is to come up with the enabling market infrastructure—hard infrastructure complemented by right policies and regulatory frameworks. The public sector will have to kick-start the market infrastructure development particularly in the hinterland. Government investment may be between 25% and 30%, and the bulk of the investment will come from the private sector.



Connectivity matters. Using digital technologies in connecting rural ecosystem services value chains and human capital with peri-urban and urban growth centers and economies gives opportunities to speed up post-COVID-19 recovery and economic renewal.

Rural Distress

Rural distress is one of the most pressing issues of today—both in the developing and the developed world. Since the 1950s, when economies of Asia, Africa, and Latin America emerged from colonial rule, the primary strategy of development was to try and move people away from farms into industry and urban areas. Modernization of urban centers was supposed to serve rural populations. Following these policies for the last 70 years, the demographic realities are that the global rural population today is 3.4 billion, and is expected to remain at over 3 billion in 2050. An overwhelming proportion of people in developing countries will continue living in rural areas well beyond 2050. The very possibility of absorbing an increasing number of rural migrants in the urban centers of these countries is already severely limited. The kind of challenges that urban populations, the urban poor in particular, face in the developing countries are sometimes even graver than the ones faced by the rural populations.

Rural areas have to become endogenous centers of economic activities. This has not been the case so far. The conventional development model argued for getting everybody out of rural areas and taking them to the cities. This has led to both rural as well as urban distress. The process needs to slow down or even needs to be reversed. A framework that provides for sustained rural development by synergizing rural–urban connectivity that is mutually reinforcing and beneficial is needed.

Governments in the region have yet to have a comprehensive rural development policy. Construction of rural roads, building of rural schools, and provision of basic social services are often presented as a proxy for rural development policy. There are a few initiatives and plans that attach value to natural resources and ecosystem services, and link these to rural wealth creation and prosperity. The Government of the PRC is at the forefront with such policies where farmers are paid for ecosystem services. However, a complex web of subsidies associated with these programs raise fiscal sustainability issues for replication in countries with limited public sector budgets. An unfriendly and complex policy and investment environment greatly disadvantages rural populations and farmers in particular.



Strengthening rural-urban linkages. Session panelists agreed that it is crucial to ensure that development policies align with rural development needs and interests to strengthen rural-urban linkages.

During the COVID-19 pandemic, remote schooling and working from home has increasingly utilized digital means and the internet, particularly areas with good internet access. In particular, in the convalescence and post-COVID-19 phase, patients and doctors are resorting to telemedicine to conduct essential consultations. Muhammad Yunus, Founder of Grameen Bank once mentioned, “The quickest way to get out of poverty right now is to have one mobile telephone.” Currently, 47% of world population uses mobile phones to access the internet. In low- and middle-income countries, 57% of people exclusively use mobile phones to connect to the internet. The importance of mobile internet is growing and this could be one option that helps in rural development.

The Food and Agriculture Organization of the United Nations (FAO) and the European Commission have released a report on *Food Systems at Risk*.⁵ UN-Habitat has developed guidelines for strengthening rural-urban linkages and this is being tried in some countries. There is universal recognition that a systems and integrated

⁵ S. Dury et al. (Eds). 2019. *Food Systems at Risk: New Trends and Challenges*. Rome: FAO, CIRAD, and the European Commission.

approach to rural development is needed. Some rural development practitioners have promoted wealth value chain frameworks to articulate and implement this approach.⁶ CIRAD is developing an integrated territorial (space) approach in collaboration with many international agencies and partners, such as FAO, the European Commission, the United Nations Capital Development Fund, African Union Development Agency (NEPAD), German development cooperation, and French development agency. The Integrated Rural Development Programs (IRDP) of the 1980s and 1990s were expert-led, and decisions were made based on a top-down approach. The CIRAD approach is bottom-up and people centered, CIRAD approach involves multi-tiered jurisdictional and governance arrangements. How efficient and effective these arrangements will be is to be seen.

Key Takeaways

- **Rural–urban linkages.** A key message is to strengthen rural–urban linkages. The development gap between rural and urban areas needs to close, and this has to go beyond just physical connectivity. We have to ensure urban development policies are aligned with rural development needs and interests, that these are mutually reinforcing and beneficial, and we have sufficient human capital (both in the state and non-state sector) available to make this happen.
- **The improvement of internet and mobile phone services,** once further upgraded to high speeds and accommodating bandwidths, can easily bring high-quality services from urban areas to rural areas. The mobile internet will help reduce poverty. Shifts by private sector corporate users in a post-COVID-19 era, increasingly working from home or remotely, will provide an opportunity for upgrading infrastructure in peri-urban and rural spaces. Utilizing digital technologies in connecting rural ecosystem services value chains and human capital with peri-urban and urban growth centers and economies provides opportunities for accelerating post-COVID-19 recovery and drive rural and urban economic renewal and prosperity.
- **Governments** could accelerate economic development, particularly rural development, by strengthening public infrastructure, especially water supply, sanitation, roads, and telecommunication in the hinterland. This will allow for the full utilization of natural and social capital potential of rural areas. Peri-urban, second- and third-tier cities and towns can become economic growth nodes and hubs, thereby decongesting highly polluted urban areas.
- A comprehensive and mutually beneficial **rural–urban policy and investment framework** that emphasizes the intensification of rural–urban linkages, provision of improved internet and digital technology infrastructure, and provision of an enabling policy and governance architecture for efficient and effective public–private partnerships is needed.

⁶ S. Ratner. 2019. *Wealth Creation: A New Framework for Rural Economic and Community Development*. New York: Routledge.



Pushing for more gender balance. More effort is needed to promote lead roles for women and women entrepreneurs in ADB-funded projects.

ADB Experience and Knowledge Sharing (Focus on Gender, Climate Change, and High-Level Technology)

Agriculture projects need to follow a holistic and value chain approach. ADB is already financing operations that adopt integrated approaches encompassing gender equity, climate adaptation and mitigation, water resources management, natural resources management, and use of ICT and high-level technologies. The horticulture value chain projects in Uzbekistan and Pakistan; the use of Internet of Things (or IoT) to promote food safety and traceability in the PRC; the climate-friendly agribusiness value chains sector projects in Cambodia, Myanmar, and the Lao People's Democratic Republic (Lao PDR); and the agriculture and rural development project in Mongolia that assists agro-processing enterprises, are a few good examples.

Under Strategy 2030, one of the cross-cutting themes is maximizing synergy and partnerships with everyone because the task at hand is so vast and bigger than what ADB can do on its own. ADB can only make a difference if it joins forces with partners and relevant stakeholders to improve the lives of people in Asia and the Pacific region. ADB has stepped up its efforts to introduce innovative approaches and technologies under its policy-based and investment loans as well as technical assistance projects. Some of these innovative projects and lessons learned are briefly described below. Other DMCs may consider adopting similar approaches and designs for their projects.

The Tajikistan Pyanj River Water Resources Project is one of the first to introduce satellite-based monitoring and evaluation (M&E) for irrigation systems. This project helps rehabilitate and modernize an existing irrigation system (about 50,000 hectares [ha]). The project prepares updated maps during project implementation and will assess updated conditions at the end of the project in 2022 (and future). Using satellite data will allow before-and-after comparison on parameters such as evapotranspiration (ET), the water use ratio (actual ET/optimum ET as well as dry and wet season cases) to monitor and evaluate system performance.



Out-of-the-box thinking. Session panelists encouraged more ADB-funded projects to be climate-resilient and innovative by using appropriate and culturally-sensitive technology.

In Mongolia, ADB is providing support to agriculture, addressing climate change and empowering women. Financing packages provided by ADB aim to (i) provide support for 15 enterprises to process cashmere, dairy products, and wool products; (ii) provide production support to the herders and farmers; (iii) help introduce cashmere wool testing facility for improving the wool product quality control; (iv) provide support for marketing and certification of products for the international market bringing investors, buyers, processors and sellers together; (v) significantly increase jobs for women in the agriculture sector (e.g., currently, 70% of the employees in the wool processing Gobi Cashmere company are women).

In South Asia, ADB currently focuses on (i) water, (ii) rural roads, and (iii) agribusiness. The Madhya Pradesh Irrigation Efficiency Improvement Project in India is introducing a pressurized irrigation system that will increase irrigated areas from 58,000 ha to 125,000 ha using the same amount of water, and with better irrigation service delivery. Design-build-operate contracts were introduced, where two contractors were appointed to design, build, operate, and maintain the system for 5 years. Water user fees are to be collected by the service contractors. In agribusiness, ADB is supporting the AgTech Application in Agriculture in Andhra Pradesh, India, which has the highest growth in the horticulture sector (17%), is ranked first in the ease of doing

business index (2017), and is the leading state for AgTech-driven innovations. A digital platform will be created where farmer producer organizations can get access to needed data, and farmer mobilization facilitators are engaged to help organize and collect data, disseminate information, build capacity, and provide advisory services.

In the Greater Mekong Subregion (GMS), the Climate-Friendly Agribusiness Value Chains Sector Project is being implemented in Cambodia, the Lao PDR, and Myanmar promoting safe and environment-friendly agro-based value chains aimed at (i) climate-resilient agribusiness value chain infrastructure, (ii) climate-smart agriculture and agribusiness, and (iii) an enabling environment for climate-friendly agribusiness.

The private sector operations of ADB complement what is being undertaken on the public sector side. While the work with governments is focused on the supply side, ensuring that factors of production are in place through irrigation, rural roads, market infrastructure, standards etc., private sector operations focus on demand. One of the models is on contract farming. In Bangladesh, ADB works with a company called Pran, which operates a potato chip factory. The company maintains contracts with 2,000 potato farmers to supply the right kind of potato. In Bhutan, ADB supports a hazelnut processor, which has helped 15,000 farmers plant hazelnut trees on their land. The company has already deployed about 200 extension workers and monitors who have travelled throughout the country to help farmers with the needed advice. They have developed their own app and have the technology. In Timor-Leste, ADB has ensured that intercropping for coffee farmers is part of a technical assistance.

Key Takeaways

- **Innovation.** ADB-funded projects need to be innovative by using technology that suits the local project implementers and beneficiaries.
- **Climate smart.** Projects need to demonstrate and deliver increased benefits and climate resilience.
- **Gender balance.** Increasingly, ADB-funded projects promote lead roles for women and women entrepreneurs. More needs to be and can be done.
- **Private sector.** Foreign direct investments in conjunction with equitable contract farming models and technology transfer can drive inclusive and equitable growth in agriculture and agribusiness value chains, thereby benefiting producers as well as consumers.



Key ally in rural development. The active participation of the private sector is essential to drive transformative changes in rural areas.

Knowledge Sharing among ADB Member Countries

India, Farmer Producer Organizations. The Government of India has ranked Maharashtra as number 1 in its Agricultural Marketing and Farmer Friendly Reforms Index in the country. The formation of farmer producer organizations (FPO)/farmer producer companies (FPC) is a process where primary producers, especially small and marginal farmers form a collective, so they become a formal legal entity. This is now one of the most effective ways to respond to agricultural challenges such as access to input and output markets, quality inputs, technology applications, improved logistic and public investment. Under the special provisions of the Company Act 1956, the FPOs have registered as FPCs. The FPOs have since emerged as one of the most appropriate institutional formats in Maharashtra to mobilize farmers. It not only builds their capacity, but also increases their production and marketing bargaining power as a group. Most FPOs formed in India are in the early stage of their operations with about 100 to 1,000 farmers as shareholder members.

Singapore. Harvest More with Less. Water-Smart Farms and Vertical Farming. Singapore needs to establish food security due to increased supply chain uncertainties. It has limited land, high costs of water and energy, climate change, supply disruption, and population growth. Singapore has launched indoor farming and uses any space found suitable to grow food. One such space being considered is walls of large housing estates. Singapore is breaking away from traditional farming methods changing from centralized to decentralized farming, thus utilizing very small spaces like 200–300 square meters per housing block in around 10,000 housing blocks. In Singapore, climate control is very important and so is biosecurity, which is crucial to be able to farm 100% free of pesticides. At the newly refurbished Funan Mall in Singapore, a pilot farm on the sixth floor is being showcased, which grows rice. Singapore is also training young people from the region in a capacity building academy on how to grow capsicum and strawberries using modern technologies. Trainees returned to their respective countries and started producing food and exporting to Singapore.

Thailand. In 2018, Thailand produced over 39 million tons of food, of which 55% was consumed domestically, about 40% was exported, and 5% was kept as inventory.



Harnessing creative thinking and partnerships. Session panelists showed that it was possible for countries to climb up the food security and international trade ladder through innovation and technology.

Some of the exports included unprocessed, semi-processed produce while others such as canned tuna, cassava starch, canned pineapple, food flavors and sauces were exported as processed goods, as well as ready-to-eat meals. Most of the exports are to the PRC, Japan, the United States, and the six Southeast Asian countries as well as the United Kingdom. Thailand is ranked 12th as a global food exporter but has only 2.36% (2018) of the global market share. Contributory success factors include farmers willing and ready to adapt to new production methods and innovations, cheap labor but now losing this competitive edge to some neighboring countries, economies of scale and food processing capacity, and productive collaboration between food processors and universities in Thailand. The government has also directly contributed to the food sector by establishing a Bank for Agriculture and Agricultural Cooperatives. The Ministry of Agriculture has a Department of Rice, and an Agriculture Research and Development Agency. These are all geared to supporting farmers and providing funding for projects relating to agriculture. However, Thailand is progressively becoming an aging society. Thailand needs a new business paradigm, as the younger generation does not wish to be farmers.

Using 5G technology could help monitor crops remotely, as well as data-driven high-resolution imaging technology to provide early warning, could help keep costs down. Using artificial intelligence technology, data analyzing techniques can also match demand with supply by using real-time data about consumer preferences and choices.

Turkey. It is the only country located between Asia and Europe and has four different climate zones with rich crop diversity. Turkey has the second largest agricultural economy among the Organisation for Economic Co-operation and Development (OECD) countries and is ninth globally. The portion of female labor in Turkey's agriculture is ranked as third largest in the world. Turkey produces over 54 million tons of fruits and vegetables, which is 3% of the total global production. Turkey is also the world's fourth largest producer of fresh vegetables, and the seventh largest producer of fruits, with an annual trading value of \$2.5 billion. Forty years ago, farmers were using traditional heating systems. Since the 2000s, modern heating systems have been introduced in the greenhouses. For example, banana production has now been switched to greenhouses to maintain higher quality. To keep the banana greenhouses heated during winter, Turkey is using geothermal energy sources. Turkey has nearly 3 million tons of installed cold storage capacity, which is very essential for exports and cold chain management. One of the advantages Turkey has is the availability of nearly 500,000 tons of naturally cooled underground storage facility (average 10 degrees Celsius) for lemons, potatoes, and onions, thus saving operating costs. Turkey's successes are due to government support, which came in the form of loans, for building greenhouses and cold chain storages. The government also supported the introduction of good agricultural practices and organic farming.

Sri Lanka. The Sri Lanka experience shows how private and public sectors can get together to assist farmers. Silvermill is a coconut-based company that helps coconut farmers derive better value from their land, which is fragmented. The national average yield is 45 coconuts per tree, whereas good yield expectations hover between 100 and 120 coconuts per tree.

Key Takeaways

- **Role of government.** The India, Singapore, Sri Lanka, Thailand, and Turkey case studies underline the fact that government support is essential in transforming the sector.
- **Innovation and technology.** Using modern technology, innovative and out-of-the-box thinking has helped these countries climb up the food security and international trade ladder.
- **Private sector.** Active participation of the private sector (farmers and producers, small and medium-sized enterprises, and agro-industry) is essential to drive transformative changes.



Promoting inclusiveness. Several organizations and clients are joining hands on portals and apps to provide their services on an easy-to-use platform.

Financing Agripreneurs and Rural Small and Medium-Sized Enterprises

The most important challenge in the world today is eliminating poverty. It is number one on the UN Sustainable Development Goals for a very good reason. Development organizations today struggle with the one big issue, which is connecting with people in remote, rural areas effectively and efficiently—the last-mile users. It is argued that we cannot solve poverty without addressing financial inclusion, and financial inclusion at any sort of scale without technology is unthinkable today. The mobile phone changed the world for most of the people and smartphones brought convenience previously unimaginable. Introduction of affordable smartphones have enabled farmers to do basic things in a simple and intuitive way: ordering inputs, renting equipment, selling produce and getting paid for it, and keeping records.

The solution needs to be easy to understand. People should have easy access to information and advisory services to help solve the multitude of challenges that constrain technology diffusion and uptake such as limited user experience, low literacy, poor connectivity, and recording of transactions to improve trust and cooperation. Organizations need to connect with last-mile users (e.g., small farmers in remote areas); the sellers, who need a more efficient way to provide products and services at scale, and have reliable means for timely payment collection; the

Agripreneurship or agritech, the term used in India, has seen phenomenal progress. The new models are building demand orientation in the supply chain, reducing number of intermediaries, making the supply chain more transparent, efficient, and ultimately benefitting the farmer, who are not only assured of income because of the demand for their produce, but the ability to raise low-cost lending. Market linkage models will essentially enable solutions to a lot of these financial challenges that currently banks and non-banking financial corporations face.

Hemendra Mathur, ThinkAg and Bharat Innovation Fund, India



Easy-to-understand solutions for all. Session panelists emphasized that technology must be inclusive, easy to use, and affordable to benefit more people.

commodity buyers, who want to trace produce or buy ethically or improve quality and show origin of goods to their customers; the nongovernment organizations (NGOs) that are already investing millions of dollars and need transparency of the impact of their projects; and the banks, the insurances, and microcredit companies that need a better way to connect with those last-mile communities.

These organizations and clients are joining hands on portals and apps to provide their services on an easy-to-use platform. This is a one-stop shop of services bringing the farmer and service providers together, including the banks. While in the short term clients and suppliers are financially sponsoring (e.g., \$50 smartphones for producers), in the long term small transaction fees are expected from millions of farmers. Working with farmer collectives as a company has opened up avenues of market linkages, advisory services as well as institution-building that become relevant in addition to finance. However, one of the constraints of a nonbank finance company in some countries is that government and multilateral development organizations focus on delivery of their projects through banks. Nonbanks are not considered part of that delivery mechanism.

Key Takeaways

- **Role of public ecosystem.** There is a huge role for public ecosystem, whether it is federal government, state government, or institutions like the Asian Development Bank. They need to come together to make things happen.
- **Open source digital platform.** An Agristats, which can be accessed by banks, insurance companies, government, start-ups, and farmers needs to be established and operational. Parameters could include information about the farmer—who he or she is, his or her location, what the farm looks like, what the produce is. Essentially Agristats links the farmer to the farm ID. It can have multiple layers such as soil nutrition, water stress, and market, which can build many interesting products and services beneficial to farmers. The technology is available and ready for diffusion and adoption.
- **Inclusiveness.** If the intention is to reach the ultimate beneficiary, the vehicle to reach that target group should be irrelevant; one should be agnostic to the delivery vehicle but focus on the destination. Public–private partnerships could explore other forms of entities that could make the program meaningful and successful for the intended beneficiaries, such as nonbank financial corporations.
- **Technology.** Must be easy to use and affordable.



Cooperation as a vital factor. Individual farmers need to acquire knowledge of practices and solutions adopted by other farmers to solve common problems.

Voices from the Field: Farmers' Experience

Smallholders as well as commercial farmers shared their first-hand experiences of challenges, difficulties, and successes in the businesses they operate with policy makers and other stakeholders.

Paulina de Afria, Philippines borrowed so much money and spent so much in planting and yet the market price of the onions for the producer is very low. In the recent cropping season, she could not even recover the cost of production. She and her husband are wondering how to give their children a better life. *Indra Gunawan, Indonesia* sees farming today is a profession with high cost and low return. Farming involves complex problems, such as shrinking farmland, decreasing quality of soil, lack of farmer-friendly technology, climate change impacts, and lack of young workers engaged in farming. In addition to the marginal returns that he gets from farming, he identified water as a major constraint—lack of equipment and technology hampers access to water. *Jit Kumari Yogi, Nepal* lamented lack of affordable and readily available seeds and fertilizer, access to electricity to operate irrigation pumps, and lack of knowledge about handling crop diseases and pests. The volatility of rainfall is also a big problem. A lot of people are moving out of the villages and going overseas for employment because there is no income from farming anymore. Since she does not see any future in farming, she has put all three of her sons through school giving them an education in the hope that they can find other sources of income. *Marites Alin Castre, Philippines* mentioned cultivating long chili and onions on 2 hectares of land and lacking capital to cover even production costs, a volatile market price for the recently harvested onions, and the floods that destroyed the crops leading to a cycle of debt.

On the other hand, *Ganpat Parthe, India* reported successfully growing organic strawberries in the Western Ghats. With support from the Government of India, Ganpat Parthe and his fellow farmer group have secured a Geographical Indication Certification, doubled the price for their organic strawberries compared to ordinary strawberries, and sent the fruit directly to the consumers after receiving orders and online payments in advance. Apart from organic strawberries, he also practices



The benefits of working collectively. Farmers from session shared the benefits of organizing themselves into cooperatives or producer organizations to link with the market and engage the private sector.

apiculture, collecting honey jointly with 1,900 small farmers, who are also involved in beekeeping. **Bektashev Jakhongir Rakhimovich, Uzbekistan** diversified from milk to growing walnuts because there was demand from overseas customers coming to Uzbekistan to buy walnuts. With a loan from ADB, Bektashev managed to create 32 new jobs in the Ferghana valley. **Amarjit Jagap, India** reported successfully exporting pomegranates to the European market. He suggested solutions such as young farmer leadership, connecting marginal farmers, sharing knowledge, putting right person at right place, involving women, focusing on specific crop, and establishing an FPC. **Mariano da Costa Alves, Timor-Leste**, started developing high-value coffee and linked the coffee farmers to end customers like a coffee shop, in order to eliminate the role of the intermediary.

Jose Romeo Ebron, Philippines is active in a cooperative, which is part of a regional network called Asian Farmers' Association for Sustainable Rural Development. The challenge is not just about inefficient markets but inefficient agricultural production. The Asian Farmer Association is now responsible for agricultural investments facilitating positive cooperative-to-cooperative production. **Patrick Renucci, Philippines** shared information about a technologically advanced rice processing complex that procures palay from farmers, and a program to help farmers to get

out of poverty and become debt-free. *Sehar Iqbal, India* reported about a group of farmers in Kedia, Bihar, India, who have come up with a model that reduced use of chemical pesticide down to zero, reduced use of chemical fertilizers by more than 80%, improved soil quality thus increasing moisture holding capacity, and replenishing all 30 shallow wells in a year when the surrounding villages have been hit by a drought. Input costs have been reduced by 92.5%.

Key Takeaways

- The **farmer** has to focus on her or his own field but work in cooperation with other farmers. Individual farmers cannot solve their problems on their own; they need to acquire knowledge of practices and solutions adopted by other farmers to solve common problems.
- **Food security.** It is important to address the issue of food security because the issue is not just to have enough food but to have access to nutritious food.
- It is important to diversify production within a viable and sustainable agro-ecological system—both to enhance nutritional and income security, and resilience to climate change and COVID-19-like disruptions. Monocultures can be a viable option within a diversified agro-ecological landscape but one has to be judicious in their use given their high vulnerability to (i) pest and disease outbreaks, and (ii) market price volatility.
- **Producer organizations.** Farmers need to organize themselves into cooperatives or producer organizations. This is one way to link with the market and engage the private sector. Individually it is very hard but as a collective group or organization, it will help farmers and producers gain economies of scale, bargaining power, and have better access to mechanization and technical know-how, finance, and investments.



The benefit of nurturing noncognitive skills. Investing in the noncognitive skills of young farmers such as motivation, integrity, and interpersonal communication skills will boost their ability to help transform their communities.

Voices from the Field: Youth Perspectives

Youth and youth representatives shared their views about farming and employment in rural areas. They shared their aspirations and experiences to explain (i) hindrances they faced in taking up farming full time, and (ii) other nonfarm employment opportunities that can be developed in the rural areas.

Youth is a critical life stage where individuals shift from dependence to independence. It is also a time when youth between 15 and 24 years make their own decisions. They are empowered with the possibility to make those decisions. Investing in youth means the possibility to change the future of the coming generations. Eighty percent of youth aged between 15 and 24 years live in rural areas in developing countries. Most of them are in Asia and sub-Saharan Africa. However, projections for the future foresee that by 2050 the percentage of youth living in rural areas will more than double in sub-Saharan countries while remaining the same or declining in Asia. Youth are central to rural development, as they are the foundation of success; for successful transition young people need to become *productive, connected, and empowered*.

The *World Development Report 2018*⁷ has underscored the importance of noncognitive skills such as motivation, integrity, and interpersonal communication skills over technical skills. Therefore, investing in noncognitive skills of rural youth is

Agriculture is high risk and I am speaking from my experience in the Philippine context: in our current food system, the ones that risk the most are rewarded the least. It is really hard to convince young people to get into agriculture, which does not hold much promise.

Enzo Pinga, Earthbeat Farms, Philippines

⁷ World Bank. 2018. [World Development Report 2018: Learning to Realize Education's Promise](#). Washington, DC.

Youth who have left farming mentioned instability and low return from farming as reasons for leaving. The five challenges that need to be addressed for retaining youth in farming are: (i) providing timely response support (extension) and inputs to farmers; (ii) increasing the reliability of farmer incomes and returns; (iii) reducing instability; (iv) scaling up capacity; and (v) increasing their participation and hearing their voices.

William Lucht, Youth for Asia, NGO and Civil Society Center, ADB

of fundamental importance. Connection creates new opportunities for rural youth. Empowering not only means giving the right but also includes the possibility of exercising those rights.

We have seen the use of purchase guarantees, which were built slowly from ground up, with small volumes of produce. This is very accessible to women and they can take this up as they can work in their backyards. We have young farmers who can actually use cell phones, which was a great moment of rejoicing as orders could be placed via apps. Farmers, especially youth, do take up positions of leadership. When we bring them to another farm to demonstrate, the learning effect is amazing as they see that more young people are applying the methods and systems and the youth farmers are part of a bigger system. Rural youth will increasingly take up opportunities if provided with more support.

Charlene Tan, Good Food Community, Philippines

Rural households may be categorized as (i) transitioning, (ii) diversified, (iii) specialized, and (iv) subsistence farm. Majority of youth in transitioning households are engaged in off-farm opportunities. The challenges that rural youth face are of four kinds: (i) capacity and skills; (ii) access to markets; (iii) access to land; and (iv) gender norms. They lack cognitive and noncognitive skills. Investing in youth will thus require investing in cognitive, and particularly noncognitive abilities and skills that are key to bringing about the necessary structural and digital transformations for agriculture to be productive and profitable in the current rural context. If access to finance is a constraint in rural areas, access to finance for rural youth is even more difficult.

Policies to support rural youth in accessing land and finance are of fundamental importance. Regarding gender norms, women face a triple challenge: they are female, young, and live in rural areas. They also face family pressure and social norms. All these constraints are embedded in a broader context, which is underscored by demographic changes, challenges of climate change, gender



The future of farming. Youth representatives urged the audience to support more young people to go into farming and to push for policies that will help them access land, technology, and financing.

balance, and the digital revolution that intensifies the rural–urban divide.

Partnering with the private sector is fundamental in an era where public funding is declining and the international community’s support to agriculture is decreasing. Governments need to give continuous support to incubate ideas and finance start-ups and empower rural youth to take part in decision-making. Youth participation is crucial in designing interventions that fit their needs. Their involvement will increase their ownership and enhance their agency.

The main messages from the IFAD report⁸ are (i) rural investment policies for youth should be embedded in broader rural development context; (ii) policies must find a good balance between creating broader rural opportunities and fostering youth-specific ones; and (iii) *productivity, connectivity, and agency* are the foundations of rural development and these have to be factored in policies and investments that promote the role of the youth in rural transformation.

⁸ International Fund for Agricultural Development. 2019. [Creating Opportunities for Rural Youth: 2019 Rural Development Report](#).

One defining characteristic of the importance of youth for the future is their openness, and willingness to adopt new ideas, innovations, and technologies. That is the key ingredient if the youth are to become the future in farming. In Agritech, a lot of founders are young, ambitious, and digitally savvy. This openness to digital technologies is not limited to expensive “high-tech” solutions; any improvement over current practices is seen as innovative, something the youth are willing to try, adopt, and change. So they are open to improved seeds, tools, mechanized improvements, and biological controls. With proper training and guidance there is a role for youth to play in the future in terms of technology disseminators or incorporate it into their livelihoods or teach it to others.

Reginald Lee, Grow Asia, Singapore

Key Takeaways

- **Noncognitive skills.** Promoting noncognitive skills among youth has been found to be more important than merely focusing on technical skills. Being connected creates new opportunities for rural youth. Empowering does not only mean giving rights to people but also includes the possibility of exercising those rights.
- **Encouraging youth to take up farming.** Young farmers, who can actually use cell phones to place orders via apps, and farmers, especially youth, do take up positions of leadership. When youth visit another farm to demonstrate, the learning effect is amazing. More young people are applying the methods and systems and the youth farmers are part of a bigger system.
- **Supportive policies and partnering with the private sector.** Policies to support the rural youth in accessing land and finance are critical just as partnering with the private sector is, which can provide platforms for start-ups and incubation.
- **Innovation and technology.** Adoption of new ideas, innovation, and technologies are the key ingredients if the youth are to become the future in farming. Being open to using improved seeds, tools, mechanized improvements, and biological controls makes youth ideal technology disseminators.



Call for greater investments. It is important to increase the private sector investment projects within the next 5 years from around 10% to at least 30% to help achieve the goals in rural development and food security.

Closing Remarks

I love giving closing remarks because I know I am facing people who are truly committed to this cause and stay all the way to the end. So, I know I will get a standing ovation at the end. You have heard all the substantive discussions, especially the discussion in the last session consisting of all the key people delivering this program. Let me thank and congratulate that group again. Also more importantly, the audience and participants who came from within this building and outside. I know it is a lot of travel they have to do. This forum is also not happening miraculously, and there are a lot of people behind the scenes who are making this happen. I would like to thank all of you.

This is really a very important topic for ADB and one of the key things that is different from previous long-term strategies is the area of agriculture, food security, and rural development. We have the space for us to thrive but the challenge is daunting; we need to work with everybody to help us achieve this.

In terms of takeaways, we need to:

- continue to focus on smallholders;
- invest in infrastructure in rural areas as much as in urban areas;
- acknowledge the huge role for governments to play in making sure there is an enabling environment;
- work collectively in the countries as well as in this building to make sure that there is no urban bias;
- harness the potential from AgTech and FinTech as well and all the other digital technologies;
- ensure that women, girls, and youth continue to thrive by creating an enabling environment;
- mitigate climate change challenges that we are facing in all our priority areas, especially in rural development; and finally,
- increase the private sector investment projects within the next 5 years from around 10% to at least 30%, so we need to crowd in private resources.

With all these great ideas, we now have enough knowledge to move forward until the next time we meet. We will be interacting with many of you through our operations and work.

On behalf of President Nakao, and Vice-President Susantono, I am very happy to bring this forum to a closure and thank everyone for being here.

Thank You.

Woochong Um

Director General, Sustainable Development and Climate Change Department, ADB

APPENDIX 1

Voices from the Field

Amarjit Jagap, Maharashtra, India

Amarit Jagap studied horticulture in college and in 2013 went back to his hometown that is known for their pomegranates. His background in horticulture allowed him to recognize that there is much room for improvement in pomegranate cultivation and he set out to apply his knowledge on his own pomegranate farm. In 2016, he established the Green Horizons Farmer Producer Company and worked with other farmers so they could export their pomegranate to Europe. They are now able to export to different countries in Europe as well as supply different local chains. They now have over 300 farmers working with them and 60% of their employees are women who are appreciated for their accuracy in detailed technical work, which is a key factor in ensuring that their produce are residue-free.

Ganpat Parthe, Maharashtra, India

Ganpat Parthe has been growing strawberries in his farm with his family since 1992. In 2015, he decided to convert and devote part of his farm into producing organic strawberries, which he can sell for a premium price. He also has a 200-box apiary that aids in pollinating his organic strawberries. To boost their income, he also opened his farm to tourists, after recognizing how they could not only sell their produce directly to consumers without any costs on transport and logistics and the need for traders or intermediaries. He is part of a group of organic

farmers growing different crops and engaged in agritourism and is committed to encouraging other farmers to do the same.

Indra Gunawan, West Java, Indonesia

Indra Gunawan is a rice farmer and member of a farmers' group that collectively owns 25 hectares of rice farmland that produces 6.5 tons of rice every year. He said that they could have more yield if only they are not dependent on the rainy season. Their irrigation systems are not properly maintained and unreliable. As a result, many farmers cannot harvest enough rice for their own consumption and for selling. Some farmers try to augment their income by planting other crops but lack the financial and technical capacity to achieve a good harvest. He would like to receive training support from the government as well as better irrigation infrastructure.

Jit Kumari Yogi, Bardiya, Nepal

Jit Kumari Yogi is a farmer in Nepal who, together with 56 other small holder women farmers formed a group to work collectively for one another and save money. In 2012, they established the Sustainable Social Women Cooperative (Deegopan Samajik Mahila Sahakari) through which they were able to acquire financial support from a bank that they used to buy cows and build cow sheds for 12 of their members. Once the members have repaid the loan the funds were used for another batch of 12 members who invested it on raising various

livestock and producing vegetable crops. The cooperative has since grown to 40 groups with a total of 620 women members. Their primary goal is for each member to be self-sustaining entrepreneurs.

Javed Iqbal, Nankana Sahib, Pakistan*

Javed Iqbal grows wheat, rice, and fruit trees in his 2.8-hectare farm. Although his crops are generally profitable, the weather is a major factor that affects his yield. Climate change has made weather events unpredictable and nonseasonal thunderstorms and hail, for example, caused severe damage to his crops. He said that another big concern for the farmers is the proliferation of counterfeit fertilizers and adulterated seeds that both affect the plants' growth. He said that farmers are being deceived or placed at a disadvantage at almost all stages of the value chain and calls on the government to put in place systems and infrastructure that would help them.

Anna Mariel Valdez, Tarlac, Philippines

Anna Mariel Valdez is a chairperson of their community's youth council. Having grown up in a family of rice farmers, she has experienced working in a farm when she was younger but her father, a rice farmer, forbade her to even consider going into farming, believing there is no bright future for her in agriculture. She disagrees though, and recognizes how important agriculture is for food security and self-sustainability and how vital it is to encourage the next generation to go into farming through training and a change in mindset among parents and their children.

Cherrys Abrigo, Laguna, Philippines

Cherrys Abrigo put up Sierreza, a zero-waste store and café to support the products of organic farmers from indigenous communities in

remote areas. She brings the produce from the indigenous communities and sell it to customers of Sierreza, which is located in an urban area, where demand for organic produce is high. The success story of Sierreza is encouraging farmers from other areas to follow the same business model. Abrigo believes the framework can be replicated in other areas and hopes that other communities would adopt the Sierreza business model.

Christine Jodloman, North Cotabato, Philippines

Christine Jodloman grew up in a rural farming community and saw all around her the struggles of rice farmers and the irony of growing the country's food but not having enough food for themselves and their families. Having a deep concern for food security and the future of agriculture, she designed Program Accelerator on Local Agripreneurship for Youth (PALAY) Initiative together with other children of farmers to encourage young people to consider farming as a viable career. They have since changed their name to Food Secure Philippines with an advocacy for sustainable farm-to-fork lifestyle for everyone.

Enzo Pinga, Laguna, Philippines

Enzo Pinga was 26 years old when he established Earthbeat Farm together with investor-partners in San Pablo, Laguna. Earthbeat grows high-value and specialty crops for hotels and restaurants in Manila and has also partnered with farmer groups from different parts of the Philippines to grow crops that are in high demand, connecting farmers with buyers, aligning farmers with market needs, and ensuring their produce gets sold. He believes that establishing processing and storage facilities in strategic areas throughout the Philippines would help farmers who have no such facilities earn more and uplift their quality of life.

* Javed Iqbal was not able to participate but sent his impressions in writing.

Jojo Romeo Ebron, Bukidnon, Philippines

Jojo Romeo Ebron grows rice and potato in his 1.5-hectare farm and also raises goats. Farming is a part-time job for him as he also carries out advocacy work for farmer cooperatives with the Asian Farmers' Association for Sustainable Rural Development. As a farmer for 20 years, and with a background in cooperatives, he helped establish a marketing cooperative that brings together 1,500 rice farmers and consolidates their harvest and sells it to a bigger cooperative instead of letting traders take advantage of the small individual farmers. He strongly believes that farmers must help each other to overcome the challenges that all of them are facing.

Marites Aline Castre, Nueva Ecija, Philippines

Marites Aline Castre grows onions with her husband on their 2-hectare farm. Farming is the only way of life they have known but life is much harder now than before. Typhoons, pest infestations, low farm gate prices, and lack of financial capacity have made making money on their land difficult in recent years. They are often buried in debt, and left with no alternative but to borrow some more. Because of their experience in farming, she hopes that her children would be able to get a good education so they would not experience their fate.

Nail Arvin Milo, Tarlac, Philippines

Nail Arvin Milo is a labor assistance and local development employee in the local government of Pura, Tarlac. Although he grew up in a rice farming family, he was discouraged from going into farming and encouraged to find a career away from agriculture. Through his job, he learned that young people like him do want to go into farming but with the help of modern technology that is already available and believes that more youths will be encouraged through education and training.

Paulina de Afria, Nueva Ecija, Philippines

Paulina de Afria farms onions and chilis on 2 hectares of land together with her husband. Their planting season for onion begins in December and harvest takes place in 100 days. They plant chili as summer starts and these are the only sources of income they have. Like many farmers in their area, she and her husband usually borrows money for their farm inputs and have repeatedly suffered heavy losses from typhoons, pest infestations, and price fluctuations. She hopes that they could receive support from the government not only for farm inputs, but against trader abuse and sudden price fluctuations.

Reginald Lee, Singapore

Reginald Lee is the Director for Partnerships at Grow Asia Singapore, a multistakeholder partnership platform created by the World Economic Forum and the Association of Southeast Asian Nations (ASEAN) Secretariat for sustainable agriculture. Grow Asia is focused on smallholder farmers and improving their productivity, profitability, and environmental sustainability by helping organizations and farmers access markets, finance, and information. Grow Asia has over 480 partners across Southeast Asia and cover about 1.3 million small holders in five ASEAN member states (Cambodia, Indonesia, Myanmar, the Philippines, and Viet Nam) and Papua New Guinea. Grow Asia engages the youth through its digital program, fosters linkages between innovators and entrepreneurs, and nurtures start-ups through its accelerator program.

Fatima de Moniz Soares, Manatuto, Timor-Leste

Fatima de Moniz Soares is a 28-year-old coffee shop owner who advocates for and promotes locally grown coffee and works to elevate the quality of coffee produced by farmers in Timor-Leste. As a former barista, she learned about

the different steps in coffee production and has a deep understanding of the needs of local growers and producers. In her coffee shop, which she established after 5 years of being a barista, she serves homegrown blends in her coffee shop and works with coffee growers and producers to market their produce as well as help them secure financial support for better equipment and water supply.

Mariano da Costa Alves, Ermera, Timor-Leste

Mariano da Costa Alves was working as a barista in a local coffee shop when he had the opportunity to visit Bali and Japan to learn about high-quality coffee and how it is produced in other countries. His exposure trip made him realize that local coffee growers and processors had much to learn about producing high-quality coffee. After 4 years as a barista, he decided to go back to his family's farm to establish their own coffee processing center. The coffee he eventually produced won a competition organized by the Timor-Leste Coffee Association, which was established with ADB support. He currently produces coffee for the international high specialty coffee market and dreams of encouraging more young people to go into farming.

Jakhongir Bektashev, Andijan, Uzbekistan

Jakhongir Bektashev is a manager of a livestock farm that produces milk and cattle that used to be run by the Government of Uzbekistan and that has been privatized. After 13 years since its privatization, the farm grew from 200 heads of cattle to 2,000. They have also since diversified their products into producing goat milk and have about 2,000 goats. Through a private sector loan from the Asian Development Bank, they have established a walnut orchard and created employment for another 20 people in their community, rounding out to 200 the number of employees of their farm. He believes farmers in Uzbekistan need financing and training support on modern technologies for farming.

APPENDIX 2

Technology and Innovation Marketplace

AgUnity

AgUnity is an Australian-based start-up founded in 2016 with the ambition to help change the lives of over 1 billion smallholder farmers in the world. AgUnity provides a mobile and blockchain solution, Axsari, which improves trust and cooperation among smallholder farmers. and It is also used as a platform for a range of problems, including mobile banking for the financially excluded, and data collection for developed world farmers. Central to the AgUnity solution is equipping farmers with smartphones and Internet of Things technologies, which transfer agency to each individual farmer and empower their collective voice. The app runs on low-cost smartphones and connects to a secure and free blockchain cloud service that can be accessed offline.

ANT Robotics

ANT Robotics developed a rice seed sowing drone for rice farming with high precision and automatic flight. The rice seed is planted inside a capsule filled with peat moss to provide more effective, precise, and uniformly distributed seed sowing. The seed sowing mechanism is designed based on a spiral spinner that can provide sufficient amount of release force that can overcome disturbances and can propel the seed toward the desired target position. Results of experiments show that the seed sowing mechanism can control the position of the capsule within 2 centimeters.

CropIn

CropIn's SmartRisk™ is an agri-ecosystem learning platform that utilizes advanced satellite imagery, extensive historical and real-time data about land composition, and detailed weather and climate forecasts to help food growers and businesses track, monitor, and evaluate every aspect of cultivation. The artificial intelligence and machine learning based platform provides insights that enable sustainable and productive food security. It is able to detect cropping patterns and predict the future of the crop, informing stakeholders of the associated risks and opportunities. Through this technology, smallholder farmers who are unable to provide collaterals to financial institutions can gain access to financial aid. These loans can enable them to invest in better quality farm inputs or modern farm machinery or equipment that would, in turn, increase their yield and income.

EagleSensing

EagleSensing provides aerial analytical solutions for tropical agriculture. They develop solutions for crop management problems in large scale plantations, using proprietary software created to derive maximum value from aerial photographs and global positioning system data. Their aerial data collection and data analysis services allow farmers to gather crop and field data, assess crop health and growth, and identify problems and areas of concern. EagleSensing specializes in translating complex data into user-

friendly, utilitarian formats to assist clients in all stages of data interpretation and application.

Geora

Geora is a commercial blockchain protocol for agriculture. Its mission is to build technology designed to financially empower farmers and agribusinesses and create new value along agri-supply chains. Geora is founded by farmers and technology experts and provide digital infrastructure to trace, trade, and finance global agri-supply chains. Geora's open source technology helps the community bridge the gap between fundamental technical components and their application to real-world use cases. They do this by making information about physical assets standardized and securely shareable between participants along the supply chain. Through both assisted and self-onboarding programs, Geora is helping its community of technology companies and agribusinesses be more efficient, sustainable, and secure.

GrainPro

GrainPro provides postharvest handling and storage solutions for agricultural commodities. Their drying and storage solutions use modified atmosphere that help reduce food losses and improve food quality by protecting agricultural products against insect infestation, mold growth, oxidation, and rancidity. Their remote sensing technology enables close monitoring of the inventory and the quality of the stocks, reduces losses substantially, and makes the stocks predictable and insurable. GrainPro products are fit for storing and transporting organic products and do not require the use of chemicals insecticides. The gas barriers of all GrainPro storage products enable quality preservation of stored dry organic commodities.

International Rice Research Institute

The International Rice Research Institute (IRRI) South Asia Regional Centre (ISARC),

in collaboration with national research organizations, has completed an Asian Development Bank-supported pilot project on climate-smart agricultural practices involving direct-seeded rice and alternate wetting and drying technologies with intercropping of vegetables between rice seasons and other appropriate crop management practices in Cambodia, Nepal, and Bangladesh. Application of these technologies using seeds of recommended variety in the pilot areas resulted in savings in water and labor cost and increased yield.

King Mongkut's University of Technology Thonburi (KMUTT)

The STEAM Platform of Transformation, piloted at KMUTT in 2018 in Bangkok, provides an experiential learning and training program on knowledge convergence, circular mindset and strategic communication skills and leadership and entrepreneurship. The STEAM Platform fosters youth leadership, especially in Asia and the Pacific, to accelerate the transformation of today's linear economy towards the emerging circular economy. The STEAM training program involves understanding technology innovation, strategically communicating innovation, and practice of innovation. The STEAM Platform focuses in building and growing ASEAN Youth Leaders and workforce equipped with STEAM knowledge and entrepreneurship skills in driving the region toward a sustainable future with Internet 4.0 and circular economy.

KMUTT Knowledge Exchange for Innovation Center

KMUTT's Knowledge Exchange for Innovation Center (KX) provides an innovation ecosystem support for food tech start-ups and businesses to deliver innovative solutions for a sustainable food industry in Thailand and the region. KX covers over 200,000 square meters of interactive space and provides a comprehensive platform for knowledge exchange among research institutions, start-ups, small and

medium-sized enterprises (SMEs), large corporations, and funding organizations, as well as collaborations on innovative solutions for sustainable development. KX offers deep tech commercialization support in the areas of energy, food and agriculture, mobility, healthcare, and service industries and accelerating the adoption of digital and circular economy.

KMUTT Research Innovation and Partnerships Office

KMUTT has a multidisciplinary team of experts that has more than 30 years' experience in providing technical assistance and management to the Royal Project food plants, KMUTT staff are well-equipped with technical knowledge and skills required to ensure sustainable, safe, and efficient food production. KMUTT has a long history of working with agricultural and food industries in Thailand. KMUTT started in the 1980s by being responsible for the technical management of the Royal Project food processing plants located in rural areas. KMUTT's competencies include automation technology and postharvest technology; various food processing facilities; food safety, security, and quality; consumption and market analysis; and waste management.

KMUTT Social Lab

KMUTT Social Lab is a platform where academic people can apply their knowledge and develop technology to meet community demands. Academic staff and students are encouraged to do field work research and create solutions for real-world problems. The mechanism also encourages varied parties and strategic stakeholders to work hand-in-hand with the community.

The mechanism focuses on three main strategies to improve the beneficiaries' quality of life. These include food security, income generation, and human resource development. The Social Lab implements the concept of

3E4A (Engineering, Energy, and Environment for Agriculture). To adapt these technology transfer efficiently, capacity building for rural people is key to enable villagers to acquire, adopt, and adapt knowledge and technologies for poverty alleviation.

KMUTT Vegetable Production Plan

This vegetable production plan was developed to allocate fair revenue to small farm holders based on their varying skills, limited farmlands, and estimated demand requirements. A model of crop procurement plan under uncertain fulfillment abilities of the farmers and disruption risks was obtained to optimize procurement costs of an agro-business. This research is the second of its kind in the world that simultaneously addresses yield uncertainties, crop rotation requirement, and fair revenue and the first one to directly optimize fair revenue.

Netatech Pte Ltd

Netatech Pte Ltd developed CrowdFarmX, the world's first cooperative farming platform on the blockchain. The goal of CrowdFarmX is to overcome the world's food crisis by facilitating smallholder farmers' direct access to best-practice farming protocols, monitoring, and control of their farms to ensure food safety and maximize production as well as connecting farmers to global demand. CrowdFarmX seeks to form the base of a decentralized and self-sufficient community of farmers and agronomists and aims to ensure stable and secure access to a demand and distribution network. Farmers can potentially participate in aggregated farming and thus benefit by having assured buyers for their produce while buyers benefit from lowered prices with the elimination of costs from traders and intermediaries.

SatSure

SAGE Banker by SatSure is a product suite for banks and financial institutions to increase financial inclusion of small hold farmers, increase

operational efficiency across the lending processes, better portfolio risk management, and reduction of nonperforming assets or loans. SatSure leverages advances in satellite remote sensing, machine learning, and big data analytics. Their geospatial big data platform combines satellite imagery using proprietary algorithms, with weather, Internet of Things, drone imagery, social and economic datasets, and cadastral, among others to generate near real-time location-specific insights with a view to assisting governments and financial institutions to assess and cope with risks in the agriculture sector.

APPENDIX 3

Program

Day 1: Monday, 28 October 2019	
7:00 – 8:30	Arrival and Registration
8:30 – 8:40	Opening Session Welcome Remarks Takehiko Nakao, President, ADB
8:40 – 8:45	Screening of Video
8:45 – 9:00	Session 1: Farming Crisis —The session describes the current challenges of farming and proposes transformative changes in policies and approaches to make farming profitable, highly productive, and attractive to youth in the region. Keynote Address Mekhala Krishnamurthy, Ashoka University, India
9:00 – 10:00	Plenary Session Moderator: Chiara Bronchi, Chief Thematic Officer, Sustainable Development and Climate Change Department, ADB Panelists <ul style="list-style-type: none"> • Mekhala Krishnamurthy, Ashoka University, India • William Dar, Secretary, Department of Agriculture, Philippines • Shenggen Fan, Director General, International Food Policy Research Institute, Washington, DC • Akmal Siddiq, Chief of Rural Development and Food Security (Agriculture) Thematic Group, Sustainable Development and Climate Change Department, ADB
10:00 – 10:15	Group Photo: ADB Management, Keynote Speakers, Panelists, Partners, Invited Guests

10:15 – 10:20	<p>Opening of the Technology and Innovation Marketplace—International research institutions, technology firms, banks, and agribusiness firms showcase their modern technologies and services, and best practices to support rural development and food security.</p> <p>Remarks Woochong Um, Director General, Sustainable Development and Climate Change Department, ADB</p>
10:20 – 11:00	Coffee Break
11:00 – 11:05	Insights and Recommendations from Session 1 —Insights and recommendations are crowdsourced from all participants via a mobile application.
11:05 – 11:45	<p>Introduction of Exhibitors and Technologies—Exhibitors may present their technologies and innovations during coffee breaks.</p> <p>Hasan Moinuddin, Program Specialist (Consultant), Sustainable Development and Climate Change Department, ADB</p>
11:45 – 12:30	<p>Introduction of Guests, Farmers, and Youth—Farmers and youth participants to express their expectations from the Forum or submit a question.</p> <p>Akmal Siddiq, Chief of Rural Development and Food Security (Agriculture) Thematic Group, Sustainable Development and Climate Change Department, ADB</p>
12:30 – 14:00	Networking Lunch
14:00 – 14:15	<p>Session 2: Dysfunctional Agriculture Markets and Malnutrition—The session discusses the impacts of dysfunctional agricultural markets on profits, farm productivity, food quality, high prices for consumers, and malnutrition.</p> <p>Keynote Address Irakli Loladze, Associate Professor, Bryan College of Health Sciences and Adjunct Faculty, Arizona State University, United States</p>
14:15 – 15:45	<p>Panel Discussion</p> <p>Moderator: Jiangfeng Zhang, Director, Environment, Natural Resources & Agriculture Division, Southeast Asia Department, ADB</p> <p>Panelists</p> <ul style="list-style-type: none"> • Martien van Nieuwkoop, Global Director of Agriculture and Food, Sustainable Development Practice Group, The World Bank, Washington, DC • Diwakar Gupta, Vice-President, Private Sector and Public-Private Partnerships, ADB

	<ul style="list-style-type: none"> • Irakli Loladze, Associate Professor, Bryan College of Health Sciences and Adjunct Faculty, Arizona State University, United States • Marco Wopereis, Director General, World Vegetable Center, Taipei, China • Anthea Webb, Deputy Regional Director, World Food Programme, Italy • Jane Gerardo-Abaya, Director, Department of Technical Cooperation Asia and Pacific Division, International Atomic Energy Agency, Austria <p>Discussants</p> <ul style="list-style-type: none"> • Jonathan Hellin, Sustainable Impact Platform Leader, International Rice Research Institute, Philippines • Howarth Bouis, Founder and Former Interim CEO, HarvestPlus, Washington, DC • Lee Pai-Po, Deputy Secretary General, International Cooperation and Development Fund, Taipei, China • Hean Vanhan, Secretary of State, Ministry of Agriculture, Forestry and Fisheries, Royal Government of Cambodia
15:45 – 15:50	Insights and Recommendations from Session 2 —Insights and recommendations are crowdsourced from all participants via a mobile application.
15:50 – 16:15	Coffee Break
16:15 – 18:00	Discussions at the Technology and Innovation Marketplace
18:30	Networking Dinner
Day 2: Tuesday, 29 October 2019	
8:30 – 8:35	Recap of Day 1 Marzia Mongiorgi-Lorenzo, Principal Country Specialist, PRC Resident Mission, ADB
8:35 – 8:50	<p>Session 3: Rural Distress—The session highlights the imbalance in rural-urban development and its significant negative impacts on national economic growth; rural employment; country's food security and nutrition; and urbanization. Specific recommendations are discussed and finalized for governments to consider for focused rural development.</p> <p>Keynote Address Mihir Shah, Distinguished Professor, Shiv Nadar University and Former Member, Planning Commission, Government of India</p>
8:50 – 10:25	<p>Panel Discussion</p> <p>Moderator: Albert Atkinson, Department of Communications, ADB</p> <p>Panelists</p> <ul style="list-style-type: none"> • Mihir Shah, Distinguished Professor, Shiv Nadar University and Former Member, Planning Commission, Government of India

	<ul style="list-style-type: none"> • Thierry Giordano, Deputy Director, Impact and Marketing of Science Directorate, CIRAD • Montserrat López Jerez, Lecturer in Global Economic History, University of St. Andrews, Fife, Scotland • David Dawe, Senior Economist, Regional Office for Asia and the Pacific, Food and Agriculture Organization of the United Nations, Thailand <p>Discussants</p> <ul style="list-style-type: none"> • Saulye Janimkhan, Vice-Minister of Food, Agriculture and Light Industry, Mongolia • Cesar Jose da Cruz, Secretary General, Ministry of Agriculture and Fisheries, Timor-Leste • Duc Chien Dang, Researcher, Head of Division of Commodity Chain and Branding Development, Rural Development Center, Institute of Policy and Strategy for Agriculture and Rural Development, Viet Nam
10:25 – 10:30	Insights and Recommendations from Session 3 —Insights and recommendations are crowdsourced from all participants via a mobile application.
10:30 – 11:00	Coffee Break
11:00 – 12:00	<p>Publications Launch</p> <p>Opening Remarks Woochong Um, Director General, Sustainable Development and Climate Change Department, ADB</p> <p>Keynote Address Bambang Susantono, Vice-President, Knowledge Management and Sustainable Development, ADB</p> <p>Special Remarks Matthew Morrell, Director General, International Rice Research Institute, Philippines</p> <p>Presentations</p> <ul style="list-style-type: none"> • Mark Rosegrant, Research Fellow Emeritus, International Food Policy Research Institute, Washington, DC • Arvind Kumar, Director, South Asia Regional Centre, International Rice Research Institute, India • Md. Abul Basher, Natural Resources and Agriculture Specialist, Rural Development and Food Security (Agriculture) Thematic Group, Sustainable Development and Climate Change Department, ADB <p>1. Ending Hunger in Asia and the Pacific by 2030: An Assessment of Investment Requirements in Agriculture—The report analyzes the impacts of different challenges faced by the agriculture sector in ADB's developing member countries and quantifies the investments required to end hunger in these countries by 2030.</p>

	<p>2. Policies to Support Investment Requirements in Indonesia’s Food and Agriculture Development for 2020–2045—The report evaluates Indonesia’s agricultural investments and policies and presents the pathways to end hunger by 2030 with an appropriate mix of investments in agricultural research and development, irrigation expansion and water use efficiency, and rural infrastructure.</p> <p>3. Application of Information and Communication Technology in the Agriculture Sector of Rural China—The report evaluates the use of information and communication technology to improve food production and distribution in the People’s Republic of China and identifies the major constraints and enabling factors in the use of such applications.</p> <p>4. Climate-Smart Practices for Intensive Rice-Based Systems in Bangladesh, Cambodia, and Nepal—The study captures the learning, technologies and outcomes from disseminating climate-smart practices and climate-resilient crop varieties for intensive rice-based systems, and water-saving and direct-seed rice technologies to farmers in Bangladesh, Nepal, and Cambodia. The report also provides policy recommendations to promote climate-smart agriculture in these countries.</p> <p>5. Country Briefs on Dysfunctional Horticulture Value Chains and the Need for Modern Marketing Infrastructure for Bangladesh, Nepal, Pakistan, and Viet Nam—The briefs present country snapshots of wholesale markets in Bangladesh, Nepal, Pakistan, and Viet Nam and offer short- and long-term recommendations to transform these into modern wholesale markets.</p>
12:00 – 13:30	Networking Lunch
13:30 – 13:45	Session 4: ADB Knowledge Sharing and Experience on Climate Change, Gender, High-Level Technology, and Natural Resources Management —The session showcases some of ADB’s innovative projects and highlights the lessons learned so that other countries may consider adopting similar approaches and designs for their projects.
13:45 – 15:25	<p>Panel Discussion</p> <p>Moderator: Ramesh Subramaniam, Director General, Southeast Asia Department</p> <p>Panelists</p> <ul style="list-style-type: none"> • Donneth A. Walton, Director, Environment, Natural Resources & Agriculture Division, Central and West Asia Department, ADB • Qingfeng Zhang, Director, Environment, Natural Resources & Agriculture Division, East Asia Departments, ADB • Mio Oka, Director, Environment, Natural Resources & Agriculture Division, South Asia Department, ADB • Srinivasan Ancha, Principal Climate Change Specialist, Environment, Natural Resources & Agriculture Division, Southeast Asia Department, ADB • Martin Lemoine, Head, Agribusiness Investment Team, Private Sector Operations Department, ADB
15:25 – 15:30	Insights and Recommendations from Session 4 —Insights and recommendations are crowdsourced from all participants via a mobile application.

15:30 – 16:00	Coffee Break
16:00 – 17:30	<p>Session 5: Knowledge Sharing among Developing Member Countries— Some countries in the region have adopted creative and out-of-the-box initiatives on public policy for both public and private investments. Discussions focus on what has been done so far, how these can be used by the governments, and further identify ways to promote policy dialogue and reforms, and public-private partnerships.</p> <p>Panel Discussion</p> <p>Moderator: Mio Oka, Director, Environment, Natural Resources & Agriculture Division, South Asia Department, ADB</p> <p>Panelists</p> <ul style="list-style-type: none"> • India: Farmer Producer Organization in Maharashtra Anoop Kumar, Principal Secretary for Marketing Department, Maharashtra, India • PRC: ADB’s framework approach for supporting PRC’s rural vitalization strategy Suzanne Kay Robertson, Principal Natural Resources and Agriculture Specialist, Environment, Natural Resources & Agriculture Division, East Asia Department, ADB • Singapore: Vertical Farming David Tan, Founder and CEO, CrowdFarmX, Singapore • Thailand: Food Processing and Supply Chain Management Charoenchai (Charlie) Khompatraporn, Head of Sustainable Technology, Management and Design Research Cluster, King Mongkut’s University of Technology Thonburi (KMUTT), Thailand • Turkey: Horticulture and Agri-food Business Development Mustafa Erkan, Professor, Department of Horticulture, Akdeniz University, Antalya, Turkey • Regional: Private Sector Initiatives in Agriculture Cedric Wijegunawardane, CFO, Silvermill, Sri Lanka
17:30 – 17:05	Insights and Recommendations from Session 5 —Insights and recommendations are crowdsourced from all participants via a mobile application.
Day 3: Wednesday, 30 October 2019	
8:30 – 8:35	<p>Recap of Day 2</p> <p>Eric Quincieu, Senior Water Resources Specialist, Environment, Natural Resources & Agriculture Division, Southeast Asia Department, ADB</p>

8:35 – 8:50	<p>Session 6: Financing Agripreneurs and Rural SMEs—Banks, venture capital firms, ICT and FinTech companies who have used successful models to serve rural areas will share their business models and success stories. The gaps in public policies and regulatory frameworks are identified and good practices are showcased through examples shared by panelists for policymakers to emulate. Recommendations to further strengthen and expand such services are discussed.</p> <p>Keynote Address David Davies, Founder and Chief Executive Officer, Ag Unity, Australia</p>
8:50 – 10:25	<p>Panel Discussion</p> <p>Moderator: Donneth A. Walton, Director, Environment, Natural Resources & Agriculture Division, Central and West Asia Department, ADB</p> <p>Panelists</p> <ul style="list-style-type: none"> • David Davies, Founding Chief Executive Officer, Ag Unity, Australia • Anna Charlotte Schou-Zibell, Pacific Liaison and Coordination Office in Australia, ADB • Ramon Duarte, Head, Platform Development at UnionBank of the Philippines • Anil Kumar, Samunnati Finance (Financial Intermediary), India • Hemendra Mathur, Venture Partner, Bharat Innovation Fund and Co-founder, ThinkAg, India <p>Discussants</p> <ul style="list-style-type: none"> • Chori Mirzaev, Chairman of the Management Board, Joint-Stock Commercial Bank “Turonbank,” Uzbekistan • Subhadeep Sanyal, Partner, Omnivore, India • Alex L. J. Shyy, Deputy Secretary General, International Cooperation and Development Fund, Taipei, China
10:25 – 10:30	<p>Insights and Recommendations from Session 6—Insights and recommendations are crowdsourced from all participants via a mobile application.</p>
10:30 – 11:00	<p>Coffee Break</p>
11:00 – 12:30	<p>Session 7: Voices from the Field—Farmers’ Roundtable Discussion—Smallholders and commercial farmers share their experiences first-hand with policymakers and other stakeholders, while expressing the concerns and aspirations of their communities at the international level.</p>

	<p>Panel Discussion</p> <p>Moderator: Carolyn Dedolph Cabrera, Principal IT Specialist (Business Change Management), Office of Information Systems and Technology, ADB</p> <p>Panelists</p> <ul style="list-style-type: none"> • Jit Kumari Yogi (Farmer), Bardiya, Nepal • Indra Gunawan (Farmer), Member of Mekar Tani II, Indonesia • Paulina de Afria (Farmer), Nueva Ecija, Philippines • Jose Romeo Ebron, Cooperative Development Program Manager, Asian Farmers' Association for Sustainable Rural Development, Philippines • Sehar Iqbal, Executive Director, Sajid Iqbal Foundation, Kedia Farming, India • Ganpat R. Parthe, Ankur Farm (Organic Strawberry Farm), India <p>Discussants</p> <ul style="list-style-type: none"> • Marites Alin Castre (Farmer), Nueva Ecija, Philippines • Bektashev Jakhongir Rakhimovich, Manager, "Baht Imkon Rivoj Chorvasi" (Private Farm), Uzbekistan • Amarjit Jagap, Director, Farm Green Horizon (Pomegranate), India • Patrick Renucci, Co-Founder, Chen Yi Agventures, Philippines • Vanchin Tsogt-Ochir, Mongolian Rural Development and Relief Association NGO, Mongolia • Mariano da Costa Alves, Coffee Farmer, Timor-Leste
12:30 – 14:00	Networking Lunch
14:00 – 14:05	Insights and Recommendations from Session 7 —Insights and recommendations are crowdsourced from all participants via a mobile application.
14:05 – 14:20	<p>Session 8: Voices from the Field–Youth Perspectives—In this session, the youth representatives explain the challenges they face in taking up farming fulltime, and other non-farm employment opportunities that can be developed in the rural areas. Potential solutions and constraining factors as well as enabling policies for sustainable rural development and job creation are also discussed.</p> <p>Keynote Address Sara Savastano, Director, Research and Impact Assessment Division, International Fund for Agricultural Development</p>
14:20 – 15:50	<p>Panel Discussion</p> <p>Moderator: Amir Jilani, Young Professional, ADB</p>

	<p>Panelists</p> <ul style="list-style-type: none"> • Reginald Lee, GrowAsia, Singapore • Christine Jodloman, Founder, PALAY and Food Secure Philippines • Cherrys Abrigo, Founder, Sierreza, Philippines • Enzo Pinga, Farmer and CEO, Earthbeat Farms, Philippines • Charlene Tan, Founder, Good Food Community, Philippines • Fatima de Moniz Soares, Timor-Leste • William Lucht, Youth for Asia, NGO and Civil Society Center, Sustainable Development and Climate Change Department, ADB <p>Discussants</p> <ul style="list-style-type: none"> • Matthias Leitner, Young Professional, Environment, Natural Resources & Agriculture Division, Southeast Asia Department, ADB • Jules Hugot, Young Professional, Private Sector Operations Department, ADB
15:50 – 15:55	Insights and Recommendations from Session 8 —Insights and recommendations are crowdsourced from all participants via a mobile application.
15:55 – 16:25	Coffee Break
16:25 – 17:15	<p>Closing Session</p> <p>Moderator: Akmal Siddiq, Chief of Rural Development and Food Security (Agriculture) Thematic Group, Sustainable Development and Climate Change Department, ADB</p> <p>Insights</p> <ul style="list-style-type: none"> • Donneth A. Walton, Director, Environment, Natural Resources & Agriculture Division, Central and West Asia Department, ADB • Mio Oka, Director, Environment, Natural Resources & Agriculture Division, South Asia Department, ADB • Jiangfeng Zhang, Director, Environment, Natural Resources & Agriculture Division, Southeast Asia Department, ADB • Suzanne Kay Robertson, Principal Natural Resources and Agriculture Specialist, Environment, Natural Resources & Agriculture Division, East Asia Department, ADB • Martin Lemoine, Head, Agribusiness Investment Team, Private Sector Operations Department, ADB
17:15 – 17:20	<p>Forum Highlights and Next Steps</p> <p>Acknowledgment of Partners and Organizers</p> <p>Akmal Siddiq, Chief of Rural Development and Food Security (Agriculture) Thematic Group, Sustainable Development and Climate Change Department, ADB</p>
17:20 – 17:30	<p>Closing Remarks</p> <p>Woochong Um, Director General, Sustainable Development and Climate Change Department, ADB</p>
17:30	Networking and Departure

Rural Development and Food Security Forum 2019 Highlights and Takeaways

Smart rural development, effective agricultural policies, and efficient regulations are critical to ensure a sufficient, safe, nutritious, and affordable supply of food to Asia and the Pacific's growing population. Toward this end, the Asian Development Bank hosted the Rural Development and Food Security Forum 2019 to prompt governments in the region to provide the leadership and transformative change needed to generate rural prosperity and effective stewardship of land and water resources. Among the topics discussed were the farm income crisis, food insecurity and malnutrition, and rural distress and prosperity challenges. This publication provides highlights from the forum, including the key takeaways.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



ASIAN DEVELOPMENT BANK
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org