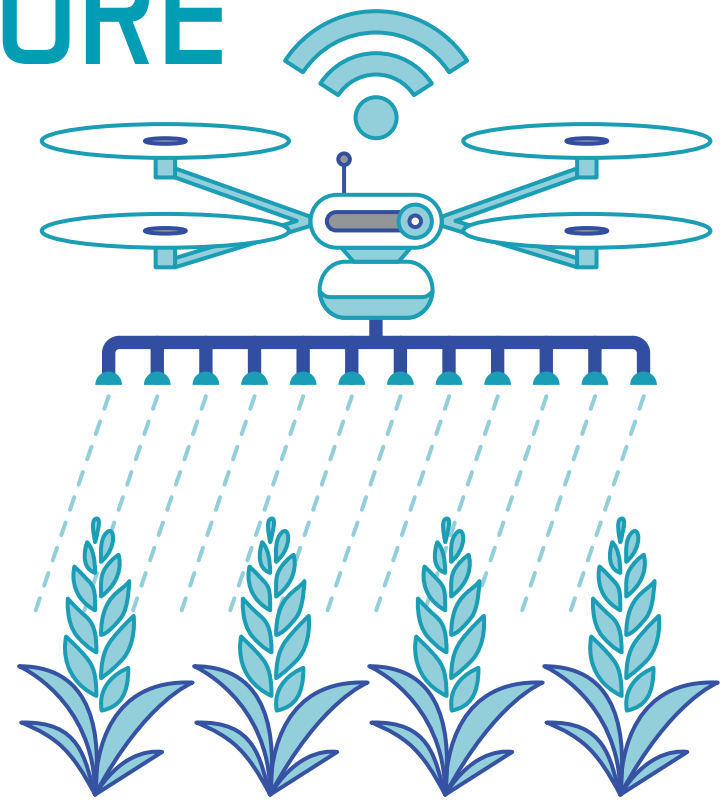
SMART AGRICULTURE



Although the share of agriculture in the GDP of Asian countries has steadily declined, it still plays important roles in overall economic growth and poverty reduction. Agriculture continues to provide employment in rural areas, especially for women; supply raw materials for agribusiness and the food industry; reduce hunger and poverty; and enhance national food security. It also provides social and environmental services. However, the sector faces multiple challenges in the 21st century.

By 2050, agriculture must feed about 10 billion people. It will also need to produce more feedstock for a huge bioenergy market. Enhancing national food security remains a top policy goal for most APO member governments. However, land and water for agriculture will become increasingly scarce. Labor shortages in rural areas, rapidly aging farming communities, and lack of interest of youth in farming as a profession threaten the sustainability of productive agriculture in many countries. The looming negative impacts of climate change will only aggravate the situation. How can agriculture still feed about 10 billion people in 2050 without overwhelming the planet?

There is an urgent need to transform current systems to promote sustainable productivity in agriculture. That transformation will require new multipronged strategies, innovative approaches, more efficient and sustainable production models, advanced technologies, and reductions in food losses and waste. Building climate change-resilient agriculture and exploring new sources of food will be critical.

During 2017, the APO continued to play a key role in leveraging technology to boost agricultural productivity and enhance the performance of agribusiness and food enterprises. Its Smart Agriculture Program focused on advanced farming technology, modern agribusiness models, advanced food-processing and -manufacturing technologies, and state-of-the-art food safety and quality management systems. The program also focused on successful rural community development strategies and future food. These will contribute to sustainable productivity in agriculture and food security; enhance farm, agribusiness, and food-industry SME competitiveness; and foster inclusive rural development in member countries.

The APO's Smart Agriculture Program projects are grouped under three subprograms: Future Food Systems; Advanced Agricultural Management; and Rural and Inclusive Development.

Future Food Systems

Demand for food will continue to increase in the foreseeable future due to expanding populations. Changes in dietary patterns will also be significant as economic development leads to more caloric and meat consumption. The provision of safe, high-quality food remains a major challenge in developing Asian countries, however. Traditional production methods and existing food products cannot meet the requirements of societies with increasing proportions of the elderly, changes to healthier lifestyles among the general population, and the need to feed more people with shrinking resources.

Promoting new multifaceted strategies to make existing food production systems and enterprises more sustainable while exploring future food sources is critical. The APO's Future Food System subprogram aims at enhancing the productivity and competitiveness of food-industry SMEs in member countries by disseminating smart management skills, modern food-processing and -manufacturing technologies, state-of-the-art quality and safety management systems, smart value chain models, and applications of digital technology in food-industry SMEs, as well as exploring potential future food.

To meet those critical goals, the APO organized a variety of projects to encourage the adoption of advanced technologies in the food industry, increase labor productivity through digital technology applications in food value chains, and improve human health while lowering public healthcare expenditures as a result of enhanced food safety and quality.

Three projects implemented in Japan under the Future Food Systems subprogram were well received by participants: multicountry observational study mission on Modern Food Quality Production Process Management Systems; multicountry observational study mission on Food Value Chain Management; and observational study mission from Myanmar on the Innovative Rice Industry in Japan. Special cash grants from the Government of Japan for undertaking those projects are gratefully acknowledged.

Advanced Agricultural Management

Asian agriculture is experiencing common challenges of low productivity, poor performance of agribusiness SMEs, shrinking land and water resources, accelerated degradation of the resource base, huge postharvest losses, low value addition, high urbanization rates, poor environmental performance, and impacts of climate change. In

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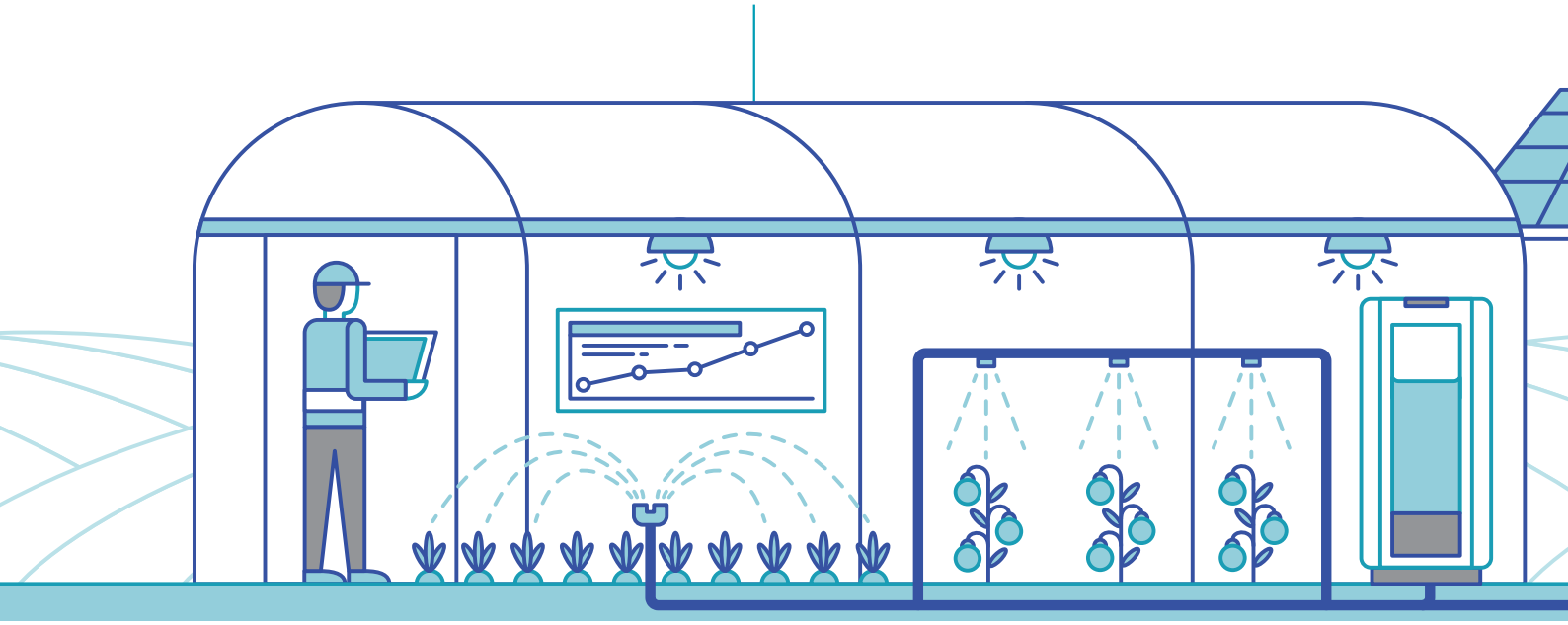


general, the profitability of small and medium-sized producers remains low. Agriculture must take advantage of current technology options to become more productive, sustainable, profitable, and convenient for farmers.

The objective of the Advanced Agricultural Management subprogram is promoting applications of advanced technologies in farming operations and agribusiness enterprises. Those applications can increase sustainable productivity in agriculture and agribusiness enterprises, promote better management of land and water resources, establish climate change-resilient models, and accelerate value addition. The APO organized numerous projects on sustainable, smart agriculture management-related topics in 2017. Expected outcomes include: the adoption of smart technologies in farming and agricultural supply chains; increased labor productivity, farmers' profitability, and agribusiness competitiveness; more youth engaged in farming; and improved food security in member countries.

Greater automation in farming can contribute to higher labor productivity and raise agribusiness competitiveness. Although the social structures and economies of APO member countries are diverse, advanced agricultural and agribusiness management skills and technologies can meet the current and future needs of all. Time will be required to confirm that systems remain future proof, but the adoption of appropriate digital technologies can only enhance sustainable productivity in agriculture.

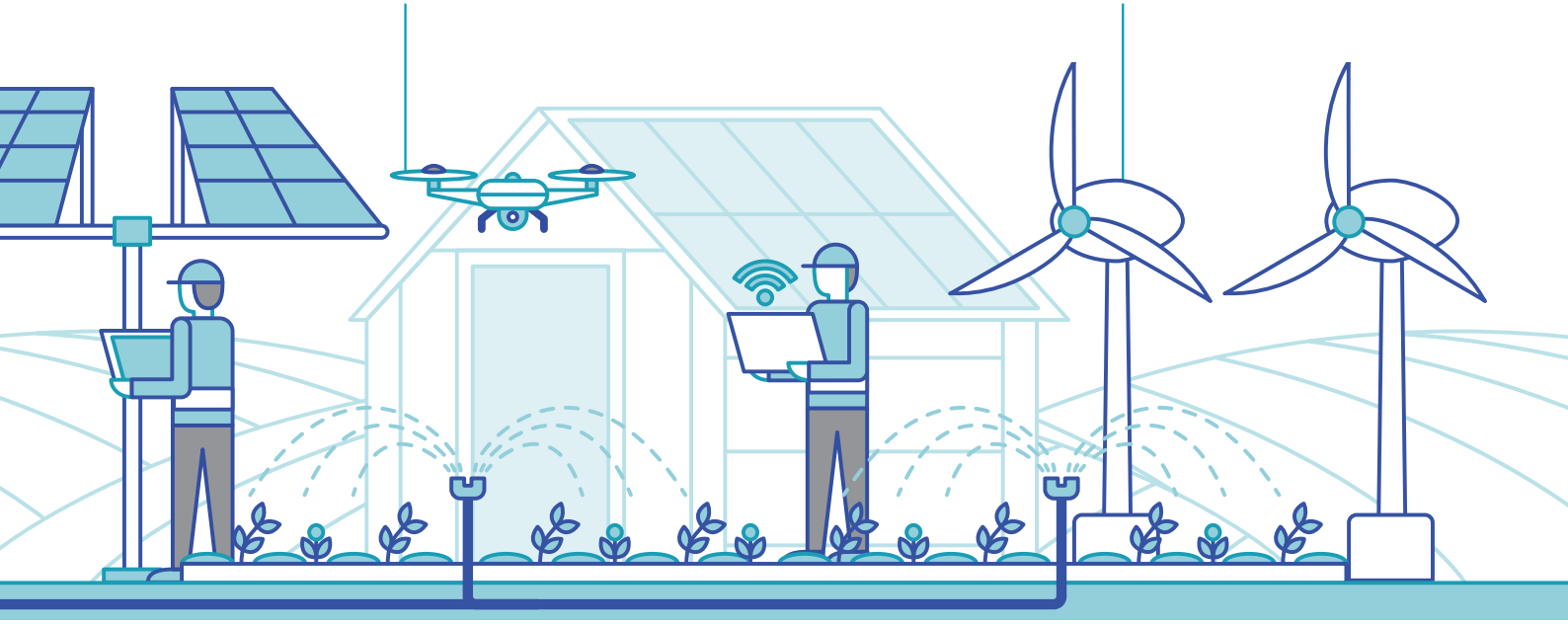
Two examples of 2017 projects relating to future-proof agricultural technologies were the: Conference on Smart Agriculture for Sustainable, Inclusive Productivity in Japan; and Asian Forum on Futuristic Technologies for Sustainable Farming in Thailand. Both entailed discussions on emerging concepts of smart agriculture, future food production systems, futuristic technologies for sustainable farming, smart water systems, hydromembrane technology, smart agricultural mechanization, precision agriculture technologies, IT applications, high-tech rice growing, Farming 4.0, and biomass utilization for energy and resources.

Rural and Inclusive Development

Most people in developing Asian countries live in rural areas and include the majority of the world's poor. They are constrained by a lack of productive employment opportunities, poor education and infrastructure, and limited access to markets and services. Those are exacerbated by the aging of rural populations

Focused on modern agribusiness models, rural community development, and state-of-the-art food safety and quality management systems.

Launched program to make food production systems sustainable and explore future food sources.



and migration of the young to urban areas. In many rural communities in the Asia-Pacific, the farming landscape is changing as women and the elderly come to dominate farm workforces. The rural–urban divide is widening, contributing to large-scale migration to cities. Rural communities must adopt new strategies, innovative technologies, and digital transformation for survival and growth.

Updated frameworks for rural development in APO member countries are needed to ensure sustainable socioeconomic development while promoting inclusive growth. The Rural and Inclusive Development subprogram addresses diverse aspects of rural socioeconomic development. Reading mega trends and applying future-scenario thinking, in 2017 the subprogram incorporated emerging global changes into APO efforts to meet specific member country needs.

To foster rural and inclusive development, 2017 projects under this subprogram covered areas such as: e-business modeling for women entrepreneurs; ICT-based services for agricultural extension; emerging roles of producers' associations and farmers' cooperatives; planning and management of community-based rural tourism enterprises; revitalization of rural communities through productivity improvement initiatives; and the Saemaul Undong model of the ROK for community development to ensure inclusive growth. All those projects covered new topics addressing the paradigm shift to digital agriculture and the specific inclusive rural community development needs of APO members.

The expected outcomes of these initiatives are increased labor productivity, competitiveness, and brand recognition through the enhanced role of women in managing e-agribusinesses, wider adoption of ICT-based services, greater role of producers' associations in capacity building for the adoption of new technologies and innovative management skills, and wider utilization of community-driven rural development models.

An exemplary project was the workshop on e-Business Modeling for Women Entrepreneurs held in the ROC. Today, the top world-leading companies are online platform providers such as Google and Amazon. With their global scale, those platforms introduce individual customers to new goods and services through online website interfaces. As digital methods overcome physical limitations to resource access for women, the workshop was applauded by the mainly female participants. Of the 31 attending, nine were from the Asia-Pacific Association of Agricultural Research Institute (APAARI), including non-APO members such as Afghanistan, Bhutan, and Samoa. The workshop showcased the APO's role as a sustainable productivity leader with outreach well beyond its own membership.

In 2017, 47 projects were implemented under the Smart Agriculture Program, which consisted of 26 multicountry ones including face-to-face, videoconference-based and online self-learning activities, and 21 individual-country projects.

Of the 26 multicountry projects, 46% were intended to achieve all three targets of the APO Vision 2020, i.e., enhancing labor productivity, competitiveness, and APO brand recognition; 42% aimed at improving labor productivity and competitiveness; and the remaining 12% were in line with at least one of the three targets. Individual-country projects were designed to meet specific needs and expectations of members based on project proposals they submitted.

During the year, a new three-year (2018–2020) cash grant worth around USD697,000 was also secured from the Japanese Ministry of Agriculture, Forestry and Fisheries.

The Secretariat also implemented six projects in collaboration with four partner organizations, the Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), Cornell University, Economic Research Institute for ASEAN and East Asia, and UN Food and Agriculture Organization. Five were under MOUs with CIRDAP and Cornell University. The year also saw APAARI participating in the workshop on e-Business Modeling for Women Entrepreneurs, demonstrating the APO's outreach beyond the Asia-Pacific as a sustainable productivity leader.