Agricultural and Rural Development / Fisheries

Of the 17 Sustainable Development Goals (SDGs), strongly associated goals are shown in color.

Global food production is vulnerable to climate and other natural environmental factors. In particular, food security in developing countries can be adversely affected in a lean year, causing heavy damage to the poor in urban areas and to small-scale farmers and fishers in rural areas.

With a view to the entire food system, JICA is providing assistance to cope with the issues of agriculture and rural development. This initiative is intended to contribute to achieving Goal 1, "End poverty," and Goal 2, "End hunger, achieve food security and improved nutrition and promote sustainable agriculture," which are primary goals of the Sustainable Development Goals (SDGs). In the field of fisheries, JICA is engaged in achieving Goal 14, "Conserve and sustainably use the oceans, seas and marine resources," of the SDGs by utilizing Japan's unique fisheries resources co-management approach.

Agricultural and Rural Development

Overview of the Issue

The environment surrounding agricultural and rural development has been diversifying because of such factors as the rapid advance of globalization, climate change, skyrocketing food prices, growing demand for biofuels, changing food preferences as personal incomes rise, the expanding participation of the private sector, and global competition for farmland. As in many developing countries, farmers account for the majority of the population and three-fourths of impoverished people live in rural areas. Rural residents in developing countries are most affected by these changes.

Among the 17 goals of the SDGs, the most important is "End poverty." According to *The Millennium Development Goals Report 2015*, issued by the United Nations, the number of people living in extreme poverty, living on less than $1.25 per day, significantly decreased over the past 25 years. Almost half of the population in developing countries was categorized as extremely poor in 1990, while the ratio dropped to 14% by 2015. However, this decrease was mainly due to economic growth in East Asia; in fact, over 800 million people are still living in extreme poverty. Notably, around 80% of these extremely poor people are living in South Asia and Sub-Saharan Africa today. On the other hand, while self-sufficiency rates for major grains have improved somewhat and the urban middle class is growing in such regions as South America and Southeast Asia, urban and rural disparities exist. In these regions, there is a need to devise ways to narrow the increasing economic gap between urban and rural areas.

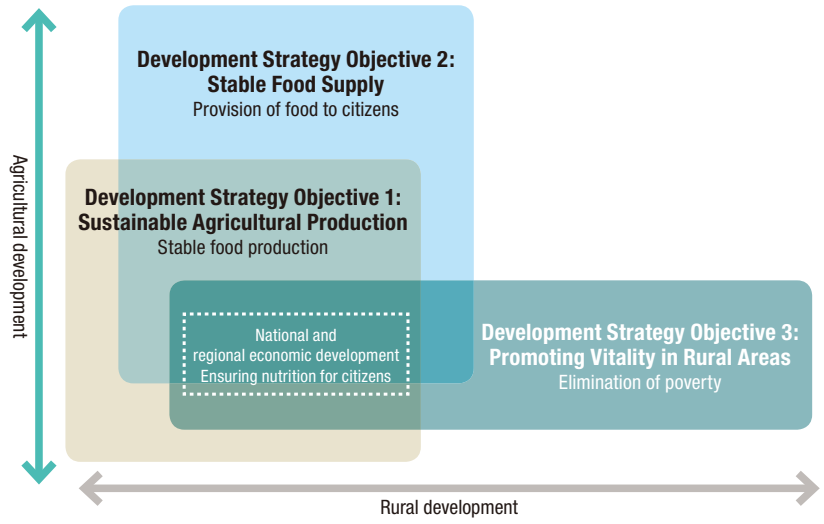
The second goal of the SDGs that comes after ending poverty is "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture." Consistently providing people with the food that they need (food security) is the foundation for economic and social stability and an important policy issue. However, the food security of many developing countries is easily affected by due to such factors as insufficient capacity of government in planning and implementation, underdeveloped agricultural infrastructure, low levels of production technology, and inadequate distribution systems that threaten the food security of citizens.

JICA Activities

JICA's cooperation in agricultural and rural development aims to ensure a stable food supply to people in both rural and urban areas and reduce poverty in rural communities — thereby driving economic development at national and regional levels. Through these activities JICA strives to contribute to achieving goals and targets of the SDGs.

For this reason JICA has established the following three specific cooperation objectives.

Agricultural and Rural Development Assistance Objectives, Philosophy and Goals



1. Sustainable Agricultural Production

Risks involving the food supply are a complex combination of short-term and long-term factors. Short-term risk factors include poor harvests owing to bad weather and accompanying speculation. Long-term factors involve population growth in emerging countries, changes in the demand structure in those countries, limitations on production resources such as land and water, vulnerability to climate change, and competition between rising demand for biofuel and food. JICA is aiming to achieve sustainable agricultural production while addressing the problem of poverty.

In its approach to enable stable agricultural production, first, JICA provides aid for drafting agricultural policies reflecting the characteristics of the partner country's overall agricultural sector [➡ see the Case Study below]. Based on these policies, JICA provides cooperation from the perspective of the overall value chain, from production to distribution and sales. Initiatives include establishing, maintaining, and managing infrastructures for agricultural production such as irrigation systems; improving the procurement and use of seeds, fertilizer and other agricultural production materials; and establishing and utilizing production technology for grain, livestock and other items while supporting institutional strengthening of associated organizations.

In addition, JICA is taking action regarding increasing the resilience of agriculture to climate change. Activities include facilitating sustainable land use, development and study on appropriate technology, developing second-generation biomass energy that does not compete with food production, introducing weather insurance, and promoting the private sector's entry into the market.

Furthermore, along with their rising incomes, citizens of developing countries are increasingly demanding high-value-added agricultural and livestock products as well as taking a greater interest in such food issues as quality and safety. These issues also need to be addressed.

A JICA expert providing instruction on rice cultivation in Uganda, a CARD member country (Photo by Yuji Shinoda)

2. Stable Food Supply

Sustainable production is the premise for the provision of a stable food supply to the people of a country. In addition, ensuring a stable supply requires the establishment of food supply and demand policies for an entire country that reflect international food security. Creation of a framework for food imports and the proper use of food aid are also necessary.

Africa accounts for the largest portion of people suffering from

Case Study **South Sudan: Project for Comprehensive Agricultural Development Master Plan (CAMP)**

Establishing Peace and Promoting Development

South Sudan became independent from Sudan in July 2011. JICA provided support for developing a comprehensive agricultural development master plan for the establishment of peace and promotion of development in South Sudan.

A Milestone of Agricultural Development

Around 95% of the land in South Sudan is suitable for agriculture, and it is said to have an extremely high potential for agricultural development. However, South Sudan is far from meeting domestic demand for food due to prolonged conflicts, drought, and very small-scale subsistence farming. South Sudan remains heavily dependent on emergency assistance and surrounding nations for food; therefore, development of the agricultural sector has been a crucial issue in the country.

For the creation of a master plan, a task team was formed, composed of South Sudan government officials in charge of crop, livestock, forestry, and fishery sectors. They began undertaking tasks with the JICA expert team. Since there was no accumulated information in South Sudan, the team started with a nationwide current-situation survey. After analyzing the possibility and issues of agricultural development, they determined the direction of development policy and then created concrete project plans. These processes allowed government officials to broaden their experience and knowledge, and they now take pride in their own master plan.

The master plan development team, composed of the task team, JICA experts, and donor experts (Photo: JIN Corporation)

The master plan was officially approved at the cabinet meeting in July 2015. As a milestone for agricultural development over the next 25 years, this master plan is expected to improve productivity, to shift the agricultural system from self-sufficiency to commercialization, and to make agriculture a key industry instead of the oil industry. Based on the master-plan documents including the goals above, the South Sudan government and donors will have discussions to ensure steady implementation of the plans.

Peace is essential for the promotion of development, while development cannot be promoted without peace. In this context, JICA continues to provide assistance in carrying out the master plan.

malnutrition in the world, estimated at 23% of the total population in 2014–2016, and is in great need of expanded food production. The amount of rice consumed in Africa is growing rapidly and there are excellent prospects for achieving sustainable growth in rice production. Therefore, rice is believed to be the key to eradicating the lack of food security on the continent.

With other donors, JICA launched an initiative called the Coalition for African Rice Development (CARD) in 2008. In order to contribute to food security, the goal is to double rice production in Africa from 14 million tons to 28 million tons over the 10-year period ending in 2018. To reach this target, JICA is providing aid for the formulation of National Rice Development Strategies in the 23 rice-producing countries in Africa and for boosting rice production in line with the strategy of each country. As for the entire Sub-Saharan African region including CARD member countries, rice production increased from 14 million tons in the reference year to 25 million tons in 2014.

3. Promoting Dynamic Rural Communities

For rural development that reduces poverty, it is important to aim for social changes and invigoration in rural villages from the standpoint of developing agricultural economies and enhancing the livelihood of people. Accomplishing this goal requires going beyond simply raising productivity. For instance, the distribution and sale of food must be improved, the food processing sector energized, export promotion measures strengthened, and agricultural management must also be upgraded to increase non-agricultural income and such.

Furthermore, aid is needed that brings together a diverse range of fields. Local administrative functions must be strengthened and rural infrastructures such as community roads and drinking water supplies established. The rural living environment must be improved and level of health and education for residents enhanced. Among other examples of aid is the narrowing of the gender gap.

Moreover, for post-conflict countries, because agricultural and rural development is often a key component of aid, JICA gives priority to these activities.

To stimulate rural development, JICA supplies aid to local administrative institutions in drafting development plans with the participation of rural residents. JICA also provides aid for the establishment of implementation systems that enable the community to raise income and improve people's livelihood, through improving the processing, distribution and sale of agricultural products.

For example, the Smallholder Horticulture Empowerment Project (SHEP, 2006–2009) and the following Smallholder Horticulture Empowerment and Promotion Unit Project (SHEP UP, 2010–2015), the technical cooperation projects implemented in Kenya to support improvement of smallholder farmers' livelihoods, have supported the farmer groups to change their attitudes from "grow and sell" to "grow to sell," introducing the concept of "Farming as a Business." As a result of various support activities—the SHEP approach—to make farmers manage market-oriented agriculture by themselves, the horticultural incomes of the farm households involved in the projects have increased. The effectiveness of the SHEP approach has been recognized by other donors such as the United States Agency

Case Study **Egypt: Project for Strengthening Water Management Transfer**

Popularizing Farmer Participation-Type Water Management throughout the Country

For years, JICA has extended assistance to improve the efficiency of water use in Egypt's agricultural sector by utilizing the techniques and knowledge of Japan's farmer participation-type water management.

Efficient Use of Limited Water Resources

Egypt relies on the Nile River for over 90% of its water resources, and the amount of usable water is limited to 55.5 billion tons per year. Due to this, the efficient use of agricultural water, which accounts for more than 80% of Egypt's total water resources, has been a crucial problem. However, in recent years, illegal irrigation and excessive water intake are increasing in tandem with the popularization of irrigation pumps, and irrigation facilities are also deteriorating. It is difficult for the government to control fair water distribution from upstream to farmland, the tail end.

JICA has implemented three technical cooperation projects since 2000 by utilizing the knowledge of Japan's highly evaluated farmer participation-type water management, which is conducted in land improvement districts. In these projects, several water users associations were established and enhanced to appropriately manage water systems, including branch canal and tertiary canals, called mesqa. In this final project, JICA utilized past outcomes and offered capacity-building assistance for the water users' associations and the Ministry of Water Resources and Irrigation (MWRI), which supports the associations. Assistance was also provided for Egypt to develop a road map, which shows a plan to transfer control of the water system to the branch waterway associations over the next ten years.

JICA also conducted flow measurements with the participation of farmers, experiments on a new water-distribution plan that takes the measurement results into account, and joint repair work. These initiatives produced very meaningful outcomes. Accordingly, one of the pilot sites successfully achieved 17% agricultural water saving and reduced the repair cost of water management facilities by 27%. The road map was also officially approved by the MWRI in March 2016 when the project was completed.

Facility survey at a pilot site to check the aging water facility with farmers

In this project, past initiatives that had been supported by various donors since the 1980s finally obtained a consensus from the MWRI for the future vision and strategies. Now it is the time for Egypt to become independent and push forward the water management transfer in accordance with the road map.

for International Development (USAID), and Japanese Prime Minister Shinzo Abe also touched on it at the opening session of the Fifth Tokyo International Conference on African Development (TICAD V) in 2013. In response to this, JICA places priority on implementing the SHEP approach in other African countries by conducting the JICA Knowledge Co-Creation Program (Group and Region Focus) as well as providing careful follow-up monitoring and technical guidance, covering 20 countries as of May 2016. To broaden the scope of utilization, a computer game is currently under development as a new public relations tool for technical officers in Africa. This game will enable them to have a simulated experience of the SHEP approach.

Fisheries

Overview of the Issue

Fisheries resources from the oceans, rivers, and lakes are important sources of food for people in developing countries. According to the UN Food and Agriculture Organization (FAO), fish and fishery products constitute more than 20% of animal protein intake in many developing countries. In addition, the fisheries sector plays an important role in terms of providing a valuable means of livelihoods for the most vulnerable populations, such as women-headed households and those people who do not possess production assets. Developing countries account for 54% of the world's exports of fishery products in value terms and 60% in volume terms (2012), making this industry vital for the economies of developing countries to earn foreign currency. As of 2014, world fisheries and aquaculture production is 167 million tons. However, the capture production from marine waters reached a peak in the 1990s, and it is believed that these resources have been almost fully exploited since then. In recent years, stagnant capture production has been supplemented by rapidly growing aquaculture production, which now accounts for 40% of total fisheries production. Yet, the aquaculture industry today is still highly dependent on capture fishery production for feed and seed, which may constrain further growth in the sector. There are also concerns that some forms of aquaculture are prone to cause negative impacts on coastal ecosystems. Therefore, it is a key challenge for developing countries to effectively preserve and manage fisheries resources and ecosystems while ensuring the sector's contributions to social objectives such as sustainable development and poverty reduction.

JICA Activities

Overfishing has now become evident throughout the world, which may shake the foundation of the livelihoods of many coastal communities. Thus, proper management of fisheries resources should be given the highest priority [➡ see the Case Study on page 97]. At the same time, it is also necessary to promote aquaculture and supplement the stagnant supply of fish from capture fisheries. In this way, fisheries resource management can be pursued in a sustainable manner while meeting the increased demand for fish and fishery products. When it comes to the fisheries sector's contributions to national food security, management of fisheries resources and promotion of aquaculture are very important, like the wheels of a vehicle.

With regard to sustainable growth and poverty reduction, development efforts should not be exerted only on increasing

Case Study **Viet Nam: The Project for the Development of Crop Genotypes for Midlands and Mountain Areas of North Vietnam**

For Production of High-Value-Added New Varieties of Rice Using DNA Information Technology

This project is a Science and Technology Research Partnership for Sustainable Development project to assist the Vietnamese government in achieving its goal of "Developing new high-yield varieties of rice using minimal agricultural materials that are resistant to pest damage and with a short cultivation period, and adapting the varieties to Viet Nam."

Preparing to Spread Superior Lineages throughout the Country

Based at the Vietnam National University of Agriculture, this project started in December 2010 and continued for five years.

The goal of this project was "Strengthening the rice breeding system to develop promising lines adapting for natural and socioeconomic conditions in the midlands and mountain areas in northern Viet Nam." In order to achieve the goal, the project team developed (1) two lineages whose growing period is ten days shorter than regular lineages, (2) a lineage whose yield is increased by 5–10%, and (3) a lineage that is resistant to pest damage and cold. The new variety in (1) is already being cultivated on 500 hectares of farmland in the north-central part of Viet Nam. Preparations are now underway to spread these varieties throughout the country.

Cultivation and crossbreeding tests were performed in a warm experimental station about 1,300 km south of Hanoi, where the university is located. Thanks to the warm test environment, the project team accelerated the generations of the varieties to three per year, when it usually produces one generation a year in Japan. This advantage greatly contributed to furthering the research.

Utilizing the acquired knowledge and techniques and experience-based know-how, young Vietnamese researchers who participated in this project are expected to continue their research at the Center for International Plant Research Viet Nam/Japan, which was newly established at the university.

Counterparts at the Vietnam National University of Agriculture receiving a lecture on DNA markers

Having a variety of social and natural environments, Viet Nam is the epitome of rice cropping in monsoonal Asia. Developing rice varieties suitable for each region in Viet Nam is anticipated to adapt and spread superior lines to rice-growing regions around the world.

production; due attention needs to be paid to maximizing the economic benefits from fisheries resources. By taking advantage of traditional knowledge and experiences of utilizing fisheries resources in Japan, JICA focuses on value chain development that involves comprehensive interventions from capture to consumption.

Based on the points above, JICA emphasizes the following three areas.

1. Fisheries Resource Management and Ecosystem Conservation

Promoting Co-management of Fisheries Resources among Government Authorities and Fishing Communities

For fisheries line agencies in developing countries whose human and financial resources are very limited, co-management is a realistic option to effectively produce meaningful results since this approach can encourage fishing communities to be proactive in managing their own resources. For the promotion of co-management, JICA combines management measures, which are essential for fisheries resource management but often bring short-term financial loss for fishing communities, with supporting measures that assist better organization and stable livelihoods of fishing communities. This approach will ensure sustainability of fishing communities' efforts on resource management.

Conserving Important Ecosystems

Coastal ecosystems, such as coral reefs, seagrass beds, and tidal-flats are important habitats for fisheries resources as spawning areas and nursery grounds; hence they are called as "critical habitats." Conserving these critical habitats is considered a prerequisite for the sustainable growth of the fisheries sector.

2. Aquaculture Development

Promoting Inland Aquaculture

Since farming fish in inland waters is the most popular way of aquaculture production in developing countries, JICA sees this production system as a priority area for support. By introducing the farmer-to-farmer extension approach, which mobilizes local leading fish farmers as community-extension workers, JICA will effectively promote aquaculture practices in developing countries with minimum support and assistance from the government authorities and institutions.

Developing a Sustainable Aquaculture System

In order to meet the increasing demand for fish and fishery products, new production technologies need to be developed for improved production efficiency as well as for environment- and ecosystem-friendly aquaculture practices. Working with universities and research institutions, JICA will promote the application of Japan's advanced technologies and knowledge in developing countries.

3. Fishery Value Chain Development

In developing countries, fish and fishery products are important commodities that are widely traded locally, regionally, and internationally. Production of valuable fishery products that meet the market requirements will greatly boost the local economy, create employment, and improve the livelihoods of fishing communities.

Case Study **Morocco: Capacity Development of Fisheries Resource Monitoring for Sustainable Management of Small Pelagic Resources**

Proper Monitoring and Assessment of Fisheries Resources with Practical Application of Japan's Technologies

Sustainable utilization of fisheries resources is one of the SDGs. JICA is proactively engaged in improvement of monitoring and assessment of fisheries resources, which is a key effort toward achieving this goal.

Providing a Good Scientific Information Base for Pelagic Resource Management

The coastal waters of Morocco are rich in small pelagic fish species such as sardines and horse mackerel. A large number of small-scale fishers and processors in the country are heavily dependent on these resources. However, the biomass of small pelagic resources is known to fluctuate naturally to a significant degree, which often causes negative impacts on economically vulnerable small-scale fishers and processors. In order to secure stable income and employment for these populations, it is essential to improve the monitoring of pelagic fish resources, which enables better forecast of future fluctuations.

Advanced technologies are required to deal with small pelagic fish species since they are highly mobile migratory species. In this regard, Japan has provided research vessels equipped with sophisticated acoustic survey devices and dispatched Japanese experts so as to support national efforts to strengthen the institutional capacity of resource monitoring. Acoustic survey is a method of estimating the types and quantity of fish in a school by using a special fish detector and analyzing the echo data from the school. It is extremely important to identify echo data differentiated by individual fish. In this regard, some research findings of the project, such as target strength values newly established for major pelagic species, are of great value. Thanks to committed efforts from the Moroccan side together with adequate technical assistance from the Japanese side, Morocco has successfully applied an advanced resource monitoring and assessment method called Virtual Population Analysis.

A marine survey ship conducting an acoustic survey

In the process, a number of Moroccan researchers with various technical expertise, including oceanography, biology, acoustic survey, socioeconomic studies, and resource assessment, took part in the project activities and made remarkable progress in their own research areas, which were then combined for the comprehensive analysis.

Overall, the project has accumulated various research findings and contributed significantly to the improved accuracy of pelagic resource monitoring and evaluation. It is believed that the continued efforts of the Moroccan counterparts in the project will provide a good scientific information base for the sustainable utilization of fisheries resources in Morocco.