FAO – CHINA
SOUTH-SOUTH COOPERATION PROGRAMME
BACKGROUND

The People’s Republic of China has been actively involved in and largely contributed to FAO South-South Cooperation (SSC) Programme since its launch in 1996. Its achievements were highly praised by FAO and the host countries’ governments. China has become the major participator, supporter and promoter of the SSC Programme. Since 1996, through the FAO-China SSC Programme, China has deployed 1,023 experts and technicians in 25 countries and regions (56 percent of the total FAO SSC experts) of Africa, Asia, the South Pacific, Latin America, and the Caribbean (as of end April 2015). These experts and technicians provided a large contribution in the technical areas of irrigation, horticulture, livestock, agriculture, crop production, agroforestry, agricultural mechanization, food processing, marketing of agricultural products, agricultural machinery manufacturing and others.

FAO-CHINA SSC TRUST FUND

China was the first country to establish an SSC strategic alliance with FAO through a Letter of Intent signed in May 2006. In 2008, the government of China decided to establish an FAO Trust Fund for USD 30 million in support of the SSC Programme. This SSC Trust Fund was a milestone in the FAO-China partnership development which promoted the cooperation to a new level.

In this context, the FAO-China SSC Programme has supported, as of April 2015, 11 SSC country projects and two global projects, in which 287 Chinese experts have been fielded in Mongolia (Phases I and II), Ethiopia, Liberia, Malawi, Mali, Namibia, Nigeria, Senegal, Sierra Leone, and Uganda (Phases I and II), to carry out agricultural technical assistance and extension work. The FAO-China SSC Programme (Phase I) supported eight capacity development activities in China and one High-Level-Forum on SSC Achievements in Africa held in Nigeria. The FAO-China SSC Programme also provided backstopping to the China-Nigeria SSC project, which was funded by the FAO-Nigeria Unilateral Trust Fund (UTF).
LESSONS LEARNED

The aforementioned achievements and results would not have been possible without FAO’s, China’s and all host countries’ joint efforts and commitments. The main lessons learned are as follows:

- **High-level commitment and support**: High-level attention and commitment from each party involved in SSC is a key foundation for the projects’ success. This could timely solve foreseen issues and challenges in implementation and thereby ensure project success.

- **SSC modalities innovated**: In order to strengthen SSC development and sustainability, ongoing innovation and improvement of the SSC modalities is important. The new modalities, such as combining long and short-term experts, enhancement of capacity at grassroots and institutional levels, facilitation of knowledge and technology sharing and transfer, and the networking of the FAO Reference Training Centres in China were introduced and should continue to be built upon.

- **Management strengthened**: The SSC management has been improved by setting effective coordination mechanisms, facilitating backstopping and technical support missions to the fields, developing SSC documentations (SSC Guidance and Operation Manual for the SSC projects’ support by the Chinese Trust Fund), and setting-up a legal framework to ensure the success of the SSC projects.

- **Monitoring and evaluation system established**: To jointly evaluate the project achievements, a monitoring and evaluation system was established by setting-up an appropriate baseline and log-framework for the SSC projects. This allowed for the timely review of the progress reports, and mid-term and final reviews of the project.

- **Communication and visibility improved**: To maximize impact and increase the visibility, communication materials, such as the SSC brochure, the FAO-China Partnership and China-Nigeria SSC booklet were prepared.

THE SSC PROGRAMME ACHIEVED THE FOLLOWING RESULTS:

- over 400 practical agricultural technologies were transferred to the host countries;
- there were 237 pilot demonstrations in more than 80 project sites conducted;
- there were 408 research reports and recommendations prepared and submitted;
- over 1,300 training activities were organized in the field;
- nearly 20,000 local farmers and agricultural technicians received field training, 70 percent of which adopted the technologies;
- more than 65,000 beneficiaries.

THE WAY FORWARD

Based on the successful achievements of the FAO-China SSC Programme (Phase I), the Premier of the State Council of the Peoples Republic of China Li Keqiang emphasized, during his visit to FAO headquarters in Rome on 15 October 2014, that China was willing to continue strengthening the sharing of agricultural technologies, experience and development solutions with other developing countries through bilateral and multilateral partnerships. He also announced a new commitment of USD 50 million to FAO in support of the FAO-China SSC Programme to improve food security and promote sustainable agricultural developments in developing countries.

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CHINA-LIBERIA SOUTH-SOUTH COOPERATION PROJECT

Smallholder farmers benefit from sustainable technologies and new crop varieties

DEVELOPMENT CHALLENGE

Agriculture is the primary source of livelihood for two-thirds of Liberia’s 3.5 million people. The value addition of agricultural commodities possesses tremendous potential to improve livelihoods, income generation and access to food in Liberia. Despite this potential, however, food security and poverty in the last 15 years have been exasperated due to the second civil war and the more recent influx of refugees.

DEVELOPMENT SOLUTION

The China-Liberia South-South Cooperation (SSC) programme was initiated to enhance agricultural production, promote the marketing of commodities and undertake local capacity building in economic and value chain improvements. To achieve this, 24 Chinese experts and technicians were deployed to provide technical assistance in crop production, aquaculture, horticulture and livestock.

KEY RESULTS

Since the start of the project, 92 new agricultural techniques, 27 plant varieties and five pieces of agricultural equipment and tools have been introduced. The new methods and varieties have demonstrated quick results in improving food crops, livestock and fisheries, some of which include:

- **Castration technology.** Through simple pig castration technologies, the weight of six-month-old pigs increased by 260 percent, from 25 kg to 90 kg. This also reduced feeding costs by 30 percent, earning farmers an extra USD 20 per pig.

- **Transplanting technology.** The team of Chinese experts implemented dry-bed rice nurseries and parachute transplanting techniques. The promotion of these practices reduced labour intensity by five times the usual amount, improved work efficiency and increased yields to 8.25 tonnes/ha. In one instance, the yield of Chinese hybrid rice was 300 percent more than that of local rice varieties.

- **Vegetable planting.** Chinese experts and technicians taught
local farmers how to produce vegetables between the crop production cycles, allowing farmers to obtain additional income in a relatively short amount of time.

- **Capacity development.** For two years, 38 young Liberian technicians worked alongside the Chinese team of experts as their counterparts. Their close collaboration proved extremely effective in transferring knowledge, techniques and experiences. The Government of Liberia has since formulated an action plan for young agricultural technicians to be continuously trained in the same manner.

**SUCCESS STORIES**

**PIGLET SURVIVAL RATE INCREASES TO 96 PERCENT WITH SUPPORT FROM CHINESE EXPERTS**

Columbus, a pig farmer near the Songhai Centre of Montserrado County in Liberia, has been breeding pigs for the last three years. However, due to the lack of appropriate technologies, sows in his farm only furrowed twice a year with the average weight of 12-month-old piglets being less than 50 kg. Suffering from an annual income shortage of less than USD 500, Columbus invited the Chinese experts to his farm for a field investigation. Following a detailed analysis, the experts provided Columbus with technical assistance on species selection, breeding, grouping, castration and feed formulation.

After six months of monitoring, the six sows selected by Chinese experts furrowed an average of nine times, and the piglet survival rate increased to 96 percent. As a result, the number of pigs in Columbus’ farm increased from 26 to 88, and the average weight of the piglets reached 98 kg, a 92 percent increase. Furthermore, the use of castration technology shortened feeding periods by 35 percent. Columbus was ultimately able to sell 34 pigs with feeding periods of 210 days, increasing his income to over USD 1,500 per year. Having realized its many benefits, Columbus shared the castration technology with eight nearby farmers, helping them to keep an accumulated 97 piglets, 43 sows and eight boars.

**KNOWLEDGE SHARING AND NEW CROP VARIETIES BENEFIT LIBERIAN SMALLHOLDER FARMERS**

Moses, a farmer in Liberia, owns 0.6 ha which he lives on growing cassava, sugar cane, rice and corn. Due to the lack of advanced planting technologies, Moses’s crop yields are low, producing barely enough for personal consumption or sale. Through the SSC project, Chinese experts trained Moses on practical skills and provided him with vegetable seeds, fertilizers and pesticides. He was initially wary of the new techniques and crop varieties. However, after seeing low-lying land become fertile and yields increase from the use of new irrigation techniques, Moses immediately began following the experts’ guidance on building field irrigation facilities. Within days, he requested further introduction of the new varieties and technical assistance provided by the Chinese experts.

**SCALING-UP**

The SSC Programme effectively transferred knowledge that was adopted at the local level, while supporting national and household food security, agricultural intensification and diversification in Liberia. Scaling-up requires more partnerships and increased investment in agriculture. The technologies and varieties introduced could continue to be carried out on a larger scale given adequate resources.

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CHINA-MALAWI SOUTH-SOUTH COOPERATION PROJECT

_China’s technical support improves Malawi’s livestock and aquaculture sectors_

**DEVELOPMENT CHALLENGE**

Despite modest economic growth in Malawi over the last 15 years, growth in the agriculture sector, the mainstay of the country’s economy, has been erratic. While the incidence of poverty has declined, it still remains high: over half of the population lives below the poverty line and more than 20 percent are unable to meet their minimum food requirements. Currently, about 44 percent of children under five are chronically malnourished and many families have been affected by various diseases.

**DEVELOPMENT SOLUTION**

In response to some of these challenges, 18 Chinese experts and technicians were deployed to Malawi through the South-South Cooperation (SSC) project to provide technical support in livestock and aquaculture. The main objective of the project was to support the implementation of the Agriculture Sector-Wide Approach, aimed at enhancing agricultural production in support of national and household food security.

**KEY RESULTS**

Over a two-year period, the SSC project successfully introduced 106 new agricultural techniques, 60 new plant varieties and six pieces of agricultural equipment and tools. Below are a few key results:

- **Livestock development.** Pig production, boar castration, dairy cow management and Hyaline layer husbandry technologies were introduced and taught. Advice regarding the use of a concentrated formula for lactating cows resulted in an increase in milk yield of over 20 percent.

- **Aquaculture development.** Three feed formulas have been created to reduce the manufacturing cost by one-third. In addition, a low-cost fish grader was produced using local materials, resulting in over 50 graders being distributed to farmers.

- **Capacity development.** Using the learning-by-doing method, 85 training courses were organized for 2,600 farmers. The expected yield increase is 15 percent.
SUCCESS STORIES

MALAWI FARMERS BENEFIT FROM CHINESE CORN THRESHING MACHINERY

Malawi depends highly on traditional agricultural equipment and tools. As a result, labour intensity is doubled and production is low. Chinese experts and technicians showcased corn threshing equipment made of local Malawian materials. The newly introduced machine increased the efficiency of corn threshing from six to eight times the original amount. In addition, it reduced labour intensity and increased the average production rate. The FAO Representative in Malawi, who visited the project site and used the tools, agreed that they were exactly what Malawi needed to advance its agricultural productivity.

CHINESE HAY CUTTERS IMPROVE EFFICIENCY FOR MALAWI FARMERS

Straw and fodder are the main sources of livestock feed in Malawi. However, the use of traditional equipment and tools in fodder processing, feed formulation and overall herd management presents a significant challenge. It has had a negative effect on the digestion, absorption and production of the farmers' livestock in the region. In response, the SSC Chinese experts designed easy-to-use equipment (manual hay cutters). Costing only USD 30, many farmers were able to afford the hay cutters and improve efficiency in their farms. The cutters, along with millet planters, seedling translators, and corn threshers, proved to increase efficiency at a low cost, and as such were widely accepted.

SCALING-UP

Following the success of the project, the governments of China and Malawi have agreed to develop the initiative further. The agricultural technology demonstration centre in China is being established and will be completed in 2015. This centre will strengthen the capacity development and training modalities of upcoming SSC and future initiatives. As Phase II shows high hopes for progress, further investment would allow for a larger percentage of Malawi’s population to benefit.

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DEVELOPMENT CHALLENGE

Despite some progress over the past decade in reducing hunger and poverty, Mali remains one of the world’s poorest countries. Agricultural development in the country faces various obstacles. To date, there has been low sustainable land development due to limited inputs and inefficient traditional practices, among others. In addition, rice production has faulted due to the availability of seeds and the increased difficulty of accessing competitive and disease-resistant rice varieties. Furthermore, extreme weather (heavy rainfall and floods) often leaves farmers with shortened growing seasons.

DEVELOPMENT SOLUTION

In response to barriers facing agricultural development in Mali and in accordance with FAO’s 2013-2017 Country Programming Frameworks, the South-South Cooperation (SSC) project aims to enhance Mali’s agricultural production through the provision of technical assistance. Through the SSC modality of long-term exchange, 17 Chinese experts and technicians provided support to crop production, aquaculture and irrigation. During their time in Mali, the SSC team successfully introduced 13 new technologies, 28 crop varieties and three pieces of agricultural equipment and tools.

KEY RESULTS

Thanks to the initiative, achievements were made in a number of areas:

- **Aquaculture.** Chinese technical aquaculture experts conducted demonstrations on catfish artificial propagation technology. The method was successfully applied, filling an important technology gap. This exchange introduced effective fish oxytocin, further building the capacity of five local technicians. As a result, 1 to 1.2 million catfish fries have been bred.

- **Vegetable planting.** Chinese experts demonstrated new seedling varieties, new transplanting and close planting methods, bagging, water-saving irrigation and ecological disease prevention. This shared technology accelerated vegetable
growth, shortened the production cycle and improved the overall quality of production.

- **Crop production.** The Chinese hybrid rice variety was introduced through a trial process in order to compare it with the local variety in Mali. After a series of experiments on all aspects that could affect the production rate, the Chinese hybrid rice proved to be better with yields reaching 6 000 kg/ ha.

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**SUCCESS STORY**

**CHINESE CATFISH BREEDING TECHNOLOGY BOOSTS RICE-FISH CULTURE IN MALI**

Catfish artificial breeding technology in Mali (particularly in Selingue district) has been underexplored and underdeveloped. In some areas, the technology has never been introduced. To fill this gap, Chinese aquaculture technicians conducted catfish artificial breeding demonstrations in Selingue Agricultural Development Zone, collecting 80 catfish groups for parental nurturing. Aquaculture technologies such as fish pond clearing, pellet feed formulation and processing, artificial induction of gonad development were delivered through technical trainings.

The trainings were delivered to 50 individuals, five of which were successful in becoming fully trained technicians for the Selingue Agricultural Development Zone fishery station.

By the end of the project, the original 80 groups of parental catfish had grown and were expected to breed 1-2 million catfish fries. This breeding will further provide fries in over 100 ha of rice-fish culture fields. Based on these results, the introduction of the catfish artificial breeding technology will continue to positively impact aquaculture in areas once dependent on the catching (rather than breeding) of fish.

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**SCALING-UP**

Although the SSC Programme effectively transferred knowledge and technologies to the local farmers, the project has been suspended due to the military coup. All the Chinese experts have departed, and there is no current timeline to resume this SSC project.

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DEVELOPMENT CHALLENGE

Ethiopia’s agriculture sector plays a central role in the economic and social life of the nation, with about 80 to 85 percent of the population employed in agriculture. Despite the economy’s heavy reliance on the sector, Ethiopia has suffered from annual national food deficits. Limited technology, poor management of resources and ineffective agricultural development has limited the further improvement of agricultural production and productivity in the country.

DEVELOPMENT SOLUTION

The China-Ethiopia South-South Cooperation (SSC) project helped to address these challenges by providing technical assistance to enhance agricultural production. Thirty Chinese experts and technicians were sent to provide assistance on crop production, aquaculture, horticulture, livestock and agribusiness. To date, the Chinese SSC team has successfully introduced 52 new techniques, 8 new crop varieties and 31 pieces of agricultural equipment and tools.

KEY RESULTS

The project has helped families to meet their cereal and vegetable needs, increased farmers’ net income, facilitated the use of new skills and knowledge in small-scale irrigation and improved the effectiveness and efficiency of extension services. As a result of the deployment of experts and the cooperation of local people, achievements were made in a number of areas:

- **Livestock production.** The survival rate of chickens has increased to more than 85 percent through the improvement of the insulation and organization of chicken coops and the strengthening of epidemic prevention and chicken feed management. Artificial insemination was introduced to promote local livestock breeding, helping to accelerate the breeding cycle and improve the ewes’ pregnancy rates.

- **Crop production.** Demonstrations on various crop plantations, production methodologies and practical technologies were performed to
enrich the crop varieties and promote their growth. As a result, millet production reached 5,451 kg/ha (a 365.9 percent increase) and the yield of sweet potatoes increased to 429 kg/ha.

- **Irrigation.** Chinese irrigation experts provided suggestions on irrigation development, guided the construction of small irrigation schemes and shared Chinese soil and water conservation practices.

- **Other technologies.** The Chinese experts designed and produced maize threshers and seedling transplants to improve production efficiency and alleviate the labour requirements.

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**SUCCESS STORIES**

**CHICKENS’ LIFE EXPECTANCY IMPROVED WITH ASSISTANCE FROM CHINESE EXPERTS**

Haila, a poultry farmer from Debre Markos Ethiopia, was struggling to turn a profit as a result of the high mortality rate of reared chickens. A detailed investigation into Haila’s poultry farm, conducted by Chinese animal health expert Peng Yansen, revealed that inadequate insulation of the coops was affecting chickens’ life expectancy by causing illness, feather picking and eventually death. To overcome this challenge, Peng divided the spacious coop into several small single rooms, covered the walls with plastic film, lined the floor with wooden chips and straw and heated the coop with charcoal. To curb the feather pecking, Peng adjusted the feed formulation, increased the mineral and salt intake and debeaked the one-week-old chickens. These activities improved Haila’s knowledge and skills in epidemic prevention and feed management, while increasing the survival rate of 1,500 chickens to more than 85 percent.

**FOOD PROCESSING DEMONSTRATIONS IMPROVE SMALL BUSINESS OPERATIONS**

Mesmasret, a college graduate living in Woliso Country in central Ethiopia, attended the food processing demonstration conducted through the China-Ethiopia SSC project. Following the demonstration, she borrowed tools and capital from Chinese cooperates to start a steamed bun business. Mesmasret’s business was highly successful, with her steamed buns selling out within half an hour each day. After one month of business operations, Mesmasret decided to end her steamed bun business and return the borrowed capital and equipment. With the money earned from her first business, Mesmasret now has enough capital to start a brand new business of her choice.

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**SCALING-UP**

The programme effectively transferred knowledge that can be adopted at the local level, while supporting national and household food security and agricultural intensification and diversification in Ethiopia. Scaling-up requires more partnerships and increased investment in agriculture. Given adequate resources, the technologies and varieties introduced through the programme could be used on a much larger scale, reaching more beneficiaries.

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CHINA-MONGOLIA SOUTH-SOUTH COOPERATION PROJECT

Mongolia Enhances Agriculture Production Thanks to Chinese Sustainable Agriculture Technologies

DEVELOPMENT CHALLENGE

No one feels the effects of climate change quite like farmers. In Mongolia, the growing season lasts for just 90 days and weather conditions have grown increasingly unpredictable, affecting crop production and, in turn, dietary diversity and nutrition. Malnutrition is high and diets are imbalanced.

DEVELOPMENT SOLUTION

Since 2010, 19 Chinese experts and technicians travelled to Mongolia to share their knowledge in technical area’s like, animal husbandry, crop production, food safety and trade. With the experts coming from the Inner Mongolia Autonomous Region of China, similarities were shared in language, culture and agro-ecological conditions with the participants.

KEY RESULTS

Thanks to this initiative, achievements were made in a number of areas:

- Animal husbandry. Forty-two new varieties of fodder and early-maturing corn crops were introduced. The later cultivation was highly successful and accepted as part of the government of Mongolia’s strategy for building the resilience of national herders. Chinese experts and technicians also provided technical support in livestock production and artificial insemination.
- Poultry farming. Egg supplies increased through enhanced intensive farming production and Mongolia’s first poultry farm veterinary laboratory was established.
- Crop production. Seven irrigation and water management systems were installed for demonstration across 4,000 hectares of land. This, along with the development of small-scale greenhouses, allowed the growing season to be extended by about two months. Additionally, 32 new varieties of vegetables for mass cultivation and over ten varieties of trees and flowers were introduced.
● **Food safety and trade.** A Hazard Analysis and Critical Control Points working group was established and completed a report on the establishment of commodity exchanges in Mongolia. The report proposed seven recommendations to strengthen Mongolian law on the agriculture side line product market.

● **Technology extension.** Experts and technicians assisted the Mongolian Agricultural Technical Extension Centre to improve its systems, and provided technical consultancy services to over 30 related companies.

● **Capacity development.** Thirteen training courses were organized, training more than 400 participants.

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**SUCCESS STORIES**

**LOCAL BUSINESS SEES CHICK AND EGG PRODUCTION INCREASE**

During the exchange, Chinese experts provided technical assistance helping Tumen Shuvuut Co. (a leading egg hatchery in Mongolia) establish technical standards, enhance daily farm management and conduct vaccinations. A laboratory for researching hen feed and bacterial testing was also established. Thanks to these contributions, chicks' growth rate jumped from 54 to 86 percent and their survival rate reached an all-time high, 96 percent at the age of 17 weeks. Furthermore, egg supply increased through enhanced domestic feed production and the establishment of the first chicken farm veterinary laboratory in Mongolia.

**SOLAR GREENHOUSE CULTIVATION BECOMES MONGOLIAN PRIORITY TECHNOLOGY**

Hands-on training was held on solar greenhouse cultivation technologies for interested smallholder farmers, the majority of which were women. This training paved the way for the construction of nearly 33,000 m² of greenhouses, introduction of 32 new vegetable varieties and ten kinds of fruit trees.

The introduction and promotion of these winter solar greenhouses has extended agricultural production year-round, improving the quantity and quality of vegetables, fruits and flowers. The government of Mongolia has since identified solar greenhouse cultivation as a priority technology in support of national vegetable production and issued relevant policies to upscale their use.

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**SCALING-UP**

The China-Mongolia SSC project Phase I effectively transferred knowledge that can be adopted at local level, supporting national and household food security as well as agricultural intensification and diversification in Mongolia. Scaling-up requires more partnerships and increased investment in agriculture. The technologies and varieties introduced could be carried out on a much larger scale given adequate resources. Based on these initial successes, the Governments of Mongolia and China are moving ahead with the project Phase II. Phase II will involve the scaling up of key technologies introduced during the first phase and the deployment of 17 long- and short-term Chinese experts and technicians. They will continue to provide technical assistance through South-South exchange to further enhance Mongolian capacities in the technical areas of bee farming, animal feed production, horticulture, poultry production, livestock, animal husbandry and aquaculture.

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CHINA-NIGERIA SOUTH-SOUTH COOPERATION PROJECT

Chinese sustainable agriculture technologies empower farmers in Nigeria

DEVELOPMENT CHALLENGE

Agriculture in Nigeria employs two-thirds of the entire labour force. Nigeria is the world's largest cassava producer and Africa's largest rice importer. However, agricultural production faces a series of hurdles that significantly stifle the sector's performance. Currently, 70.2 percent of the population live on less than USD 1 per day, with the majority of the poor residing in rural areas. In addition, with the current rapid population growth, there is increased pressure on agribusiness sectors to reduce poverty in Nigeria. Failing to curb this pressure could impact future agricultural and economic development in the country.

DEVELOPMENT SOLUTION

The China-Nigeria South-South Cooperation (SSC) programme has facilitated the sharing of technical knowledge and experiences in agronomic practices. A total of 574 Chinese experts and technicians were sent to Nigeria to provide technical assistance on crop production, aquaculture, horticulture, livestock and agribusiness. The new agricultural techniques, crop varieties and equipment and tools introduced by the SSC team are showing quick results, improving the production of food crops and increasing farmers' incomes.

KEY RESULTS

The project is helping to enhance agricultural production and food security through improvements in water control, crop intensification, aquaculture and agribusiness. Thanks to the initiative, achievements have been made in a number of areas:

- **Food crop production.** Highly effective rice production technologies have been introduced and resulted in significant increases in rice production, from 1 tonne/ha up to 3.5 tonnes/ha.
- **Aquaculture.** The Chinese cage fish farming technology has been adopted by at least 5,000 fishing families in various regions. With the introduction of the technology, a previously idle lake has become the primary income source for nearby populations. Over 50 fish cages
and eight floating bridges were established on the lake with a capacity to produce over 10,000 fish.

- **Horticulture.** Chinese horticulture technicians have been effectively providing technical service on farm planning, orchard establishment and management and vegetable production. A total of 800 moringa seedlings with a 98 percent survival rate were planted, and 10 ha of mango, orange and guava orchards were established.

- **Apiculture.** The Chinese demonstrated and trained farmers on technologies related to wild bee harvesting, Chinese beehive construction, honey production and processing, among others. Beekeeping is now a popular income-generation activity among youth in the area.

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**SUCCESS STORY**

**CHINESE CAGE FISH TECHNOLOGY SPARKS FISH FARM GROWTH**

Mrs Maryam Sadiq Mahmood is the proud owner of the 8 ha Zunnurain Farm which produces fish using earthen ponds. Prior to the SSC programme, only two out of the eight existing earthen ponds were marginally operational. Due to very poor yields, Mrs Mahmood was operating at a loss and was on the verge of abandoning the investment.

One expert (Mr Yu Daquin) and one technician (Mr Pan Xian Fang) from China were deployed to the farm. They introduced the cage fish technology on a nearby lake which had been idle for years as a means to increase catfish production. As a result, Mrs Mahmood’s farm has over 60 fish cages and eight floating bridges operating on the lake. In addition, over 12,000 fish have been harvested and sold from the cages and over 8,000 fish from the earthen ponds. The intervention also created 15 jobs for unemployed youths, women and farmers.

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**HONEY BRAND CREATED WITH THE HELP OF CHINESE TECHNICIANS**

The Chinese SSC technicians taught 31-year-old Yahaya Sani and his family about beekeeping and honey extraction using boxes. As a result of their support, Yahaya now has 48 beekeeping boxes of both Kenyan and Chinese varieties. Yahaya sells an average of six cartons (36 cans) of honey every two to three months at trade fairs and owns the brand Sabuwa Baban Zuma Honey.

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**SCALING-UP**

Over the past ten years, the China-Nigeria SSC programme has touched the lives of more than one million people by increasing food security, generating income for farmers and creating agricultural and off-farm employment for young people.

The first phase of the SSC programme operated as a series of projects. In contrast, the second phase has involved an integrated programme of activities closely aligned with Nigeria’s Agricultural Transformation Agenda. It is clear that while good progress has been made on the SSC programme, many gaps still exist on how to successfully scale up the interventions. Greater attention should therefore be given to the development of institutional mechanisms for scaling up successful interventions.

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Chinese sustainable agriculture technologies increase production in Senegal

DEVELOPMENT CHALLENGE

Agriculture in Senegal faces several constraints that threaten the food security of rural populations. Low yields in aquaculture production, insufficient number of pilot farms and insufficient supervisory personnel in terms of both quality and quantity, have worsened food insecurity and poverty in the country.

DEVELOPMENT SOLUTION

The South-South Cooperation (SSC) project in Senegal contributed to alleviating rural poverty and improving rural households' food security through enhanced agricultural productivity and production. A total of 24 Chinese experts and technicians provided technical assistance to Senegalese farmers on crop production, aquaculture and livestock. Since their arrival, the SSC team has successfully introduced 33 new agricultural techniques, 30 new crop varieties and ten pieces of agricultural equipment and tools.

KEY RESULTS

Thanks to this initiative, achievements were made in a number of areas:

- **Fish feed processing technologies.** The Chinese aquaculture technician trained fish station staff and introduced several practical methods in fish feed processing. These methods were adopted and applied by local fishers, increasing aquaculture breeding and farmers’ incomes.
- **Rice direct seeding technology.** The Chinese rice technicians conducted demonstrations on high-yield rice production technology. In Dagana, these demonstrations resulted in a yield of 11.25 tonnes/ha, a local record.
- **Horticulture.** Vegetable production demonstrations on gourd, okra, spinach, amaranth and pumpkin were performed in Louga area. With the varieties and methods shown in the demonstration, the production of
gourd increased by 30 percent (reaching 3,000 kg). In addition, Chinese experts suggested the intercropping of mangos and vegetables to make better use of arable land and provide local farmers with additional income.

- **Livestock.** The Chinese experts introduced artificial insemination as a means to improve the quality of milk production. By adopting this technology, milk production increased from 1 litre/day to 15 litres/day.

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**SUCCESS STORIES**

**SUSTAINABLE RICE TECHNOLOGIES AND FARM DEMONSTRATIONS IMPROVE YIELD**

Dagana province in northern Senegal is located in the heart of the delta plain of the Senegal river and is a major grain production area. However, due to high seeding rates, uneven fields and lack of fertilizer, the local average rice yield was only 4-6 tonnes/ha. A field investigation performed by Chinese technicians showed that the large seeding quantity is one of the key reasons for low yield. The technicians then identified the appropriate seeding rate and conducted demonstrations with high-yield rice production technologies. These demonstrations resulted in a yield of up to 11.25 tonnes/ha, a local record for direct seeding rice. In light of the positive results, the chief of the agricultural department has promoted the incorporation of the technology into local rice production.

**CATFISH AND TILAPIA BREEDING IMPROVES IN SENEGAL**

The aquaculture technician Zhou Dunxi trained fish station staff on several practical skills such as checking fish pituitary gland and gonads, among others. He also established a set of tilapia and catfish breeding standard operating procedures to increase fish production. The fish feed technician Li Jun conducted investigations on fishery resources and fish feed marketing, developed a set of feed formulations for tilapia and catfish and created standard operating procedures for feed processing, indicating that feed need not be limited to the development of pellets.

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**SCALING-UP**

The programme effectively transferred knowledge that can be adopted at the local level, supporting national and household food security and agricultural intensification and diversification in Senegal. Scaling-up requires more partnerships and increased investment in agriculture. Based on the achievements made in Phase I, the Government of Senegal has submitted the request for Phase II to scale-up the identified priority technologies and accomplishments.

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CHINA-SIERRA LEONE SOUTH-SOUTH COOPERATION PROJECT

Community access to food improved in Sierra Leone

DEVELOPMENT CHALLENGE

Agriculture is the largest sector in the economy of Sierra Leone, employing over 65 percent of the labour force. Although the country has enormous agricultural resource potential, there are still many communities that have inadequate access to food. In addition, an insufficient amount of large-scale holdings, limited market access, inadequate operational funds and lack of agricultural expertise have all hindered further agricultural development.

DEVELOPMENT SOLUTION

Through the China South-South Cooperation (SSC) project, the transferring of agricultural techniques at grassroots level has enhanced agricultural production in Sierra Leone. The project facilitated by Chinese experts worked to increase the performance of the agriculture sector, improve irrigation systems and increase rice, field crop, vegetable and agroforestry productivity.

KEY RESULTS

The Chinese SSC team of experts and technicians successfully introduced 68 new agricultural techniques, 56 new crop varieties and 35 equipment and tools, helping to boost agricultural production. Thanks to the initiative, achievements were made in a number of areas:

- **Virus-free potato planting technologies.** The virus-free potato seeds from China were introduced in the temperate mountain region along with demonstrations on potato planting methods. As a result, more than 8,000 kg of potatoes were harvested in one season and farmers’ annual income significantly increased.

- **Livestock farming.** The Chinese experts and technicians introduced the production of corn as animal feed. As a result, farmers were able to increase their incomes from livestock production.

- **Rice production.** The introduction of a Chinese hybrid rice variety, along with the use of animal waste as fertilizer, resulted
in a drastic improvement in rice yield from 0.9 to 4.1 tonnes/ha.

- **Vegetable cultivation.** Chinese experts identified that due to the short production cycle and ease of marketing, local farmers who planted vegetables such as pepper, tomato, cabbage, cucumber, greens and cowpea would be able to plant three crops of vegetables per year and sell the harvest to generate additional income.

### SUCCESS STORIES

#### VIRUS-FREE POTATO SEEDS PROVE SUCCESSFUL IN SIERRA LEONE

Ms Jallo and her family grow vegetables on 8 ha of farmland. Due to the limited technology used in traditional production methods, her household’s annual income was previously only about USD 800. In May 2011, Mr Jiant (a Chinese technician) introduced virus-free potato seeds from China and conducted successful potato planting demonstrations on Ms Jallo’s farmland. In December 2012, Ms Jallo harvested more than 8 000 kg of potatoes and 25 000 kg of cabbage becoming one of the largest local vegetable producers in her town. In addition, her annual income reached over USD 20 000. Ms Jallo’s success in producing potatoes and other vegetables also helped spark the interest of surrounding farmers in the new seeds.

![Vegetable garden](image)

#### FARM YIELDS INCREASE FOR SMALL-SCALE FARMERS IN SIERRA LEONE

Musa Alhassam Korlugbonda, a farmer from Kenema District in Sierra Leone, plants rice, corn and other crops. Due to the low yield and small scale of his crop production, however, his family struggled to earn an income and sustain their livelihood. Musa sought help from the SSC Chinese technical expert (Mr Wang) in his district. Following a field investigation, Mr Wang helped Musa to upgrade his farm’s productive activities through the transfer of practical agricultural techniques, particularly the production of corn as feed to increase income from livestock production. Musa’s farm now produces corn feed in production seasons and uses stored green corn stalks as feed in the dry season through the corn stalk green storage technology.

Following the project, Musa’s corn production expanded to 6 ha. In the second half of 2012, the farm had produced 20 cows and 40 sheep and Musa was able to generate an income of USD 3 200. In addition, the success of his farm resulted in the mobilization of 25 farmers for a study on new production management technologies introduced by the Chinese experts.

![Livestock farm](image)

### SCALING-UP

The knowledge transferred through the programme was effectively adopted at the local level, supporting national and household food security as well as agricultural intensification and diversification in Sierra Leone. Scaling-up requires more partnerships and increased investment in agriculture. Given adequate resources, the technologies and varieties introduced through the programme could be used on a much larger scale.

#### CONTACT US

Interested partners are invited to contact FAO for more information.

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CHINA-UGANDA SOUTH-SOUTH COOPERATION PROJECT

China Lends Uganda Support to Boost Agribusiness

DEVELOPMENT CHALLENGE

Uganda is endowed with fresh water resources and high agricultural potential. The population, young and predominantly rural, is mostly engaged in subsistence rainfed farming. The country is vulnerable to extreme climate change, with common events such as rainstorms, heat waves, droughts, and floods having adverse effects on the livelihoods of its population. These factors have put an increased pressure on the agribusiness sector to generate employment opportunities in rural areas.

DEVELOPMENT SOLUTION

Since 2012, 31 Chinese experts and technicians have been sent to Uganda to provide technical assistance in crop production, aquaculture, horticulture, livestock and agribusiness. The team has successfully transferred 25 new technologies, and introduced 17 new varieties such as hybrid rice, foxtail millet and maize, as well as four pieces of agricultural equipment and tools. The new technologies and varieties introduced are showing quick results with improved food crops and have increased the income of farmers.

KEY RESULTS

The agribusiness sector has enjoyed significant results which include:

- **Food crop production.** Demonstrations and comparative tests showed that crops of Chinese foxtail millets yielded three times as high as local Ugandan finger millets. In addition, the Chinese millets have a shorter maturity period, making it easier to avoid Uganda’s dry season. Results also showed that introduced varieties of hybrid rice yielded much higher than local varieties.

- **Cash crops production.** Thanks to the technologies transferred by FAO, the proportion of high quality apples in demonstration orchards reached 85 percent. The weight of a single apple increased and the quality improved as well. In 2014, farmers signed a contract
for 100,000 apple seedlings and are expected to earn more than UGX 200 million (about USD 79,000).

- **Aquaculture.** Uganda has extensive lowlands. Fully utilizing lowland or wetland areas to construct fish ponds is an appropriate method to improving aquaculture, as fish are diminishing in Ugandan lakes. To address this, the Chinese experts conducted demonstrations in three farms, and rice-fish culture and fish hatchery technologies were promoted in many districts.

- **Agribusiness.** With the collaboration of FAO’s team, two Sichuan delegates visited Uganda to look for investments and business opportunities in the agriculture sector. During the first visit, both countries reached a mutual understanding and signed the Sichuan-Uganda agricultural cooperation framework agreement. Following this, three managers of Sichuan companies visited the rice and cotton producing areas.

## SUCCESS STORIES

### BIGGER AND BETTER APPLES FOR UGANDA FARMER

Ugandan farmer John Keith Rwamahe encountered ongoing technical problems while apple planting over the years. In particular, with Uganda’s tropical environment, apple trees do not shed their leaves in the winter and apple growth suffers due to limited light. Through the South-South Cooperation (SSC) initiative with China, a new set of apple production technologies (including seedlings, grafting, soil and fertilizer, pruning and bagging), helped Rwamahe’s yield increase by 90 percent and significantly improve the apple quality.

### HIGH-YIELD HYBRID MILLET CULTIVATION FOR UGANDA FARMER

The Chinese technicians Wei Runwu and Li Honglin conducted the hybrid millet cultivation demonstrations in Muzardi, Mukono District of Uganda. They performed the demonstration using the millet variety of a Chinese technician in a field of 150 m² in comparison with a control field with Ugandan local finger millet. Low seedling density was the key technology in high-yield hybrid millet cultivation, setting 450,000 plants per hectare.

The results from the demonstrations showed that the Chinese millet yields were two to three times more than that of Uganda finger millet, and the growing period was shortened by one-fourth. This result could effectively allow farmers to avoid the adverse weather in the dry season.

## SCALING-UP

SSC between China and Uganda enabled the effective exchange of expertise at the local level while supporting national food security, agricultural intensification and diversification in greater Uganda. Based on these early achievements, both Governments have agreed to move ahead with Phase II.

Priority areas of the project Phase II have been identified through a joint formulation mission which will include horticulture, cereals production, aquaculture, livestock and agribusiness. All of which will be supported through the development of sustainable business models. As China looks for continued expansion and upscaling of this SSC experience, additional resources will be required along with expansion of trade linkages, which is another priority area for Phase II.

### CONTACT US

Interested partners are invited to contact FAO for more information.
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