



**Sci-Tech Empowering Rural
Transformation Report**

2023

**Youth Innovation and
Entrepreneurship**



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Foreword

Notwithstanding their inherent vitality and creativity, the youth stand at a critical juncture, where their engagement is indispensable for the realization of Sustainable Development Goals (SDGs) and the pursuit of collective well-being. Nonetheless, it is observed that the livelihoods of rural youth are invariably besieged by myriad challenges. These encompass constrained access to essential assets such as land, limited availability of inputs and services, including financial instruments, and a dearth of opportunities for skill enhancement due to educational barriers, familial obligations, and urban allure, potentially culminating in migration and unemployment.

As the Rural Revitalization Strategy has steadily been implemented in China, more and more rural young people return to their hometowns to start their businesses, and many of their urban counterparts also choose to commit themselves to rural areas. They bring back new technologies and techniques, inspire new rural occupations, integrate the development of different industries, and improve the living environment of rural residents. Practical actions prove that the youth is the pioneering force of rural vitalization. The employment and entrepreneurship of Chinese youth in rural areas can bring experience and inspiration to the development and transformation of rural areas worldwide.

The Thematic Study on Sci-Tech Empowering Rural Transformation is jointly initiated by the China Internet Information Center (CIIC), the Food and Agriculture Organization of the United Nations (FAO) Representation in China, the International Fund for Agricultural Development (IFAD) China Office, World Food Programme (WFP) China Office and the Centre for Sustainable Agricultural Mechanization of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP-CSAM).

CIIC, FAO Representation in China, IFAD China Office, WFP China Centre of Excellence, ESCAP-CSAM jointly compile the 2023 Annual Report on Youth Innovation and Entrepreneurship. The report highlights the useful new technologies and the latest practices in empowering agricultural value chain development. Professor Robert Walker, a fellow of the Royal Society of Arts of the Academy of Social Sciences and a foreign professor at Beijing Normal University, provides special support for this report.

The report aims to draw lessons from China's youth' practices on leveraging science and technology to empower rural development and promote the exchange of experience among developing countries through South-South cooperation knowledge sharing.

Chapter 1: Overview of the polices

According to the seventh population census in 2020, China has a young population of about 399 million, accounting for 16.43% of the global youth. This massive youth group is a powerful driving force for China's sustainable development. The literacy rate among youth is 99% in both sexes. Over last three decades youth unemployment remained average of 8 to 10%. Supporting their innovation and entrepreneurship is always considered a vital development policy and a strategic task by the government. In particular, the policy supporting young people's innovation and entrepreneurial activities related to agriculture – the essential industry of the national economy, rural areas, and farmers, runs through the implementation process of China's Rural Revitalization Strategy and has become a vital component of the set of policies supporting youth innovation and entrepreneurship.

1.1 A brief introduction to the youth talent support policy

Since 2013, governments of all levels in China have nudged, encouraged, and supported young people to actively innovate and start businesses in rural areas by centering around rural development priorities. It introduced and continuously improved relevant policies. The central government and relevant departments have provided institutional guarantees for young people engaging in innovation and entrepreneurship related to agriculture, rural areas, and farmers with the overall policy framework and institutional design and created an enabling environment for innovation and entrepreneurship in society.

The central government and relevant departments have issued a series of policies to encourage young people to engage in rural development (see **Appendix**). Multi-dimensional policies and guidelines are established, covering financial support, fiscal and tax incentives, venue/site support, public services, market access, talent introduction, and training, providing institutional guarantees for young people to shine in the vast rural areas, start their own business or engage in flexible employment, and promote rural revitalization.

Guided by the general guidelines issued by the central government, governments at all levels have given and implemented a series of policies to promote youth innovation and entrepreneurship following local conditions to serve the development of agriculture, rural areas, and farmers (see **Appendix**). These policies encourage and rally young locals to serve rural revitalization, strive for high-level development, and become an influential force for driving local social and economic development.

1.2 The main contents of the youth talent support policies

To promote innovation and entrepreneurship among the youth and encourage them to put down roots in the vast rural areas, China has built a relatively complete and ever-improving set of support policies, covering multiple dimensions with industrial policy development, talent development, and innovation and entrepreneurship guidance at the core. The government also works closely with universities and enterprises and has jointly formed an innovation and

entrepreneurship ecosystem to promote youth innovation and entrepreneurship.

1.2.1 Encouraging youth to innovate and start businesses in rural areas

China actively promotes education on innovation and entrepreneurship in higher education institutions, vocational education institutions, etc., to equip young students with the necessary knowledge and skills. Courses on innovation and entrepreneurship are offered, and innovation and entrepreneurship competitions and field practices are organized, to cultivate the innovator and entrepreneur mindset. The government also encourages students to participate in scientific and technological innovation projects actively and provides financial support and guidance for related projects. More systematic, comprehensive, and targeted policy supports are offered for young entrepreneurs and innovators returning to rural areas, covering eight aspects including market access, financial services, fiscal support, land and electricity use, entrepreneurial training, and incubation parks etc.

1.2.2 Reward and incentivize young innovators and entrepreneurs

To help young people innovate and start businesses, the Chinese government has issued policies covering talent introduction, technical guidance, financing and loans, etc. Besides policy incentives, there are also rewards. For example, Hubei Province stipulates that where conditions permit, rent subsidies for business premises rented by current college students and recent graduates who obtained their college degree within the preceding five years to start their first business, with a term of not more than three years, the local authorities may grant rewards and subsidies to the demonstration bases and youth innovation and entrepreneurship parks with an outstanding incubation record: a maximum of one million yuan for certified provincial-level business incubation demonstration bases for college students, and another one million yuan for certified national-level demonstration bases.

1.2.3 Build a contingent of young innovators and entrepreneurs in the field of agriculture

The young entrepreneurs are encouraged to conduct technology cooperation with government-financed scientific research institutions and other enterprises, promote the commercialization and industrialization of scientific research achievements, and support the commercialization and sustainable development of their innovations and technological achievements. The innovation and entrepreneurship mentor system is continuously improved, and mentors with experience and resources are hired to provide guidance and consulting services for young innovators and entrepreneurs. The mentors can share their personal experiences, offer guidance on innovation and entrepreneurship projects, help solve practical problems, and improve youth innovation and entrepreneurship capabilities. In November 2022, China's Ministry of Agriculture and Rural Affairs and Ministry of Finance jointly issued the Implementation Plan for the Cultivation of Head Goose Leaders for the Revitalization of Rural Industries, planning to cultivate about 10 "head geese" in each county every year, and a contingent of "head geese" leading the revitalization of rural industries in five years, drive the new-type agricultural business entities to form a talent pool across the country and consolidate the human resources support for the revitalization of rural industries.



1.3 Effects of the youth talent support policy

Focusing on critical areas such as cutting-edge science and technology, industrial innovation, social services, and rural vitalization, the financial and policy support is provided to young people to engage in rural development and carry out innovation and entrepreneurial activities in the extensive rural world. According to public data, as of November 2022, there were 2,936 youth entrepreneurship organizations affiliated to county-level youth federations across the country, covering 95.4% of all counties[2]; there were 17,000 mentors at all levels guiding how to solve problems for more than 300,000 young entrepreneurs. In critical areas such as scientific and technological innovation and rural vitalization, and for vital groups such as young entrepreneurs whose startup are in the early stage, the “Youth Create” China Youth Innovation and Entrepreneurship Support Program and the Rural Entrepreneurship Assistance Program for College Students have been launched. So far, they have provided more than 140 million yuan[3] of funding in money and in-kind, effectively alleviating the financial difficulties facing youth entrepreneurs.

Chapter 2: Technological empowerment driving agricultural transformation

2.1 Overview

Agricultural automation and mechanization promote productivity and resource efficiency, ensure food security, and catalyze transformation to achieve a more resilient and sustainable agri-food system. FAO's report *The State of Food and Agriculture 2022* noted that the overarching principle for agricultural automation is responsible technological change, leading to efficient, productive, inclusive, resilient, and sustainable agri-food systems. Responsible technological change is a process that entails anticipating the impacts of the technologies on productivity, resilience, and sustainability while focusing on marginalized and vulnerable groups, including women, youth, and small-scale producers.

Youth extend an essential influence in the process of sci-tech empowerment for agricultural production. The rapid development of agriculture and rural areas has provided a broader stage for young people to use technology to build villages. Among them, young scientists have provided scientific research and technical support for agricultural production; young farmers have returned to their hometowns and are rooted in the land use new technology to promote sustainable agricultural production. In recent years, the number of young people returning to their hometowns for employment and entrepreneurship in China has been increasing yearly. Among various entrepreneurship models, smart farming based on digital technology and advanced intelligent agricultural machinery has become popular for many young people returning to their hometowns.

Mechanization is an essential pillar of agricultural modernization. The integration of agricultural mechanization with digitization, intelligence, and the Internet of Things (IoT) is accelerating, making agricultural production more relaxed and exciting, and attracting the youth. Educated and cultured young people can promote the application of new technologies through mechanization innovation, transforming agricultural production and management methods. This, in turn, helps ensure food security, enhance the quality and efficiency of agriculture, and effectively link small farmers, driving shared prosperity.

This chapter will focus on agricultural production and present case studies generated in China in technological innovation by young scientists and young farmers in two main areas. The first covers digital agricultural machinery technology, sharing innovative modes and practices of agricultural mechanization. It also discusses the opportunities mechanization provides for young people returning to their hometowns based on rice-wheat rotation and intelligent aquaculture case studies. The second is on precision agriculture, showcasing innovations practiced by young scientists and small farmers in addressing food loss reduction, digital cultivation in wheat-corn relay cropping, and youth participation in agricultural sci-tech extension. Lastly, drawing on these Chinese cases, the chapter offers insights and lessons for other developing countries to leverage the strengths of their youth in boosting agricultural production through technological innovation.

2.2 Cases of agricultural production

Digitization, informatization, and technologization of China's agricultural production are steadily advancing. According to the China Digital Rural Development Report (2022), China started exploring digital breeding in 2021. Significant developments have been made in the research and application of intelligent agricultural machinery, breakthroughs in constructing smart large-scale farms, simultaneous advances in digitization, standardization, and scaling of livestock and poultry farming, and several digitally supported aquaculture models have been put into production. The informatization rate of agricultural production in 2021 was 25.4%. The following five cases illustrate how young Chinese farmers and agricultural scientists are engaging in precision agriculture production practice via emerging technologies.

2.2.1 Digital agricultural machinery

Mechanization is a vital pillar of agricultural modernization. On the one hand, the merging of agricultural mechanization with digitization, intelligence, and IoT is accelerating, making agricultural production more stimulating and exciting, attracting the youth. On the other hand, young people, using their knowledge and technology for mechanization innovation, can better promote the application of new technologies and foster the transformation toward sustainable agriculture. Combined with IoT, information technology achieves complete mechanization plus digital management, forging a modern agricultural industrial chain.

(1) Main approaches of sustainable agricultural mechanization innovation by the youth

With economic development and scientific advancement, digital agriculture is becoming the trend in agricultural transformation. Agricultural machinery is a critical support factor for the growth of digital agriculture. The transformation of traditional agriculture is dependent on innovative agricultural mechanization. By integrating sensors, satellite positioning, remote sensing, and other informational technologies with IoT, complete mechanization plus digital management can be achieved, and a modern agricultural industrial chain can be established.

Case 1: Digital technology boosts rice production upgrade

Post-1980s farmer Sun Zhenzhong is a Ph.D. in agriculture, and his wife Wei Qiao is a master's degree holder in soil science. In 2017, the couple resigned from their jobs and returned to Zhenjiang City to start their entrepreneurial journey of running a company founded by their parents. They established an ecological farm named Run Guo Farm which is managed on rotation practices of rice and wheat crops with a land area of over 25,000 mu.

Armed with a grasp of new agricultural technologies, the couple first digitalized the entire food cultivation chain from tilling, planting, management, harvesting to post-harvest processing and sales. Modern technologies such as geographic information systems, autonomous driving, and remote sensing data in agricultural production enable



Sun Zhenzhong and his wife Wei Qiao inspecting the growth of their crops.

more accurate assessment of climate impacts. In turn, this guides the precise use of fertilizer application, better pre-planned cultivation, field management, and harvesting to achieve modernized agricultural operations. Major practices include:

High-quality mechanized operations throughout the rice-wheat cycle. Advanced intelligent agricultural machinery and equipment such as conveyor system for seeding transfer, smart tractors, unmanned plant protection machines, high-clearance sprayers were introduced in the process. Grain drying, storage, and processing facilities were adopted as well. These measures covered all aspects of grain production, which improved production efficiency substantially and laid a profound foundation for precision and digital agricultural operation.



Grain harvesting at Run Guo Farm

Agricultural product traceability system. By assigning a unique QR code to each plot of farmland, all farming operations such as sowing, agro-chemical spraying, fertilizing and harvesting can be recorded. A field video system was established, displaying real-time details of each farmland block (including size, paddy or dry land, crops, etc.), agricultural operation records (including operation times, agricultural input consumption, etc.), and meteorological information (including temperature, wind, precipitation, etc.), ensuring stable and secure agricultural production in the face of climate change.

Digital agriculture cloud platform. Benefiting from the construction of IoT and other informational systems, the couple and farm managers can remotely monitor field conditions in real-time from the office, monitor soil fertility and crop pest conditions, and promptly schedule pest control, fertilization, and other operations, achieving meticulous and effective management. The cloud platform currently integrates over 20 subsystems, including agricultural machinery IoT remote management system, soil and fertilizer management system, pest monitoring system, field weather service system, intelligent decision-making system, etc. For example, the agricultural machinery IoT system records detailed information about the machine type, operation time, location, and route, which can help obtain automatic scheduling of machinery and improve the efficiency and the effectiveness of costs.

Ecological management and green sustainable development. The farm utilizes the natural wetland function of rice fields, introduces higher-order predatory species, and combines green plant protection technology to build environmentally-friendly agricultural “ecological islands.” 4R technologies were applied for non-point source pollution management. 4R stands for Reduce the emission at source, Retain pollutants in process, Reuse nutrients, and Restore ecosystem. Through non-point source pollution management and building the “ecological island”, the overall goal of reducing pollutants and improving water quality in small watersheds has been achieved, and the rice quality has been improved.

Case 2: Healthy breeding smart fishery

Post-1990s farmer Gao Lanxuan was born in Nanjing City. She was in an interior design and landscape gardening institute after graduating in 2011. By a chance encountering with agriculture, she resolutely gave up her job in the city, moved to the Liuhe District of Nanjing, and established the Fenglin Bay Eco-Farm in 2023. The farm primarily focuses on aquaculture, with over 1,000 mu of ponds for lobsters/crabs, over 300 mu for fish, and another 600 mu for rice-shrimp rotation. It has been recognized as a national demonstration farm for healthy and ecological aquaculture by China's Ministry of Agriculture and Rural Affairs (MARA).

Traditional aquaculture has a relatively low degree of mechanization, with high labor usage and intensity. As a farm manager dedicated to innovation, Ms. Gao introduced new aquaculture mechanization equipment into the farm by adopting digital devices, including sensors and Internet of Things, and established a Smart Farm. In addition, aquaculture treats effluent water harmless, and a green and healthy ecological system has taken shape resultantly. These investments provided a profound base for initiating and developing more diversified business models such as recycling systems in breeding and planting, integrating tourism with agricultural exposures, etc. Major practices include:

Full mechanization in aquaculture: In the past, aquaculture machinery equipment was limited to fixed-point feed dispensers, oxygenation pumps, and microporous aerators. Manual labor was extensively required for feeding, monitoring water quality, and harvesting special aquatic products. The farm introduced unmanned feed boats and automatic net-lifting machines to reduce labor costs and the risks of heatstroke or drowning under harsh conditions like high temperatures and rain. In recent years, the unmanned feed boat, a newly developed agricultural product, comes with automatic navigation technology to distribute feed or target specific areas for intensive feeding uniformly. This effectively addresses the limitations of traditional feeders which are not suitable for particular aquatic products like crayfish and crabs (unlike fish, crayfish and crabs prefer to hide underwater plants and won't move around following the feed [5]). Using the automatic net-lifting machine significantly reduces the intensity of manual harvesting and shortens the time from the pond to cold chain transport, thereby reducing mortality.

Intelligent monitoring system for aquaculture water environment: To cope with extreme weather attacks such



Fenglin Bay Ecological Farm Aquaculture Demonstration Field



Gao Lanxuan (left) checks the growth condition of crayfish.

as high temperatures and sweltering heat caused by sudden weather changes in the summer and other seasons, the farm employed “IoT + mechanization” technology to build an intelligent monitoring system for the aquaculture water environment. The smart monitoring equipment can be powered by solar energy, equipped with dedicated sensors, and digitally connected to oxygenation equipment. It can monitor water temperature, dissolved oxygen, pH value, and other parameters, uploading them to an online terminal in real time. A synchronized mobile app was developed, enabling real-time monitoring on computers and mobile phones. When water indicators, especially dissolved oxygen, show abnormalities, it automatically activates the oxygenation equipment and sends alerts to both the computer and mobile terminals, facilitating prompt action to prevent losses and achieve efficient digital management.

Harmless treatment system for aquaculture tailwater: Aquaculture tailwater contains a large amount of organic pollutants such as ammonia nitrogen, nitrite, phosphorus feed residues, and excrement from aquatic animals. Direct discharge can pollute the surrounding farmland, soil, and rivers[6]. To maximize environmental protection, the farm, with financial support from the Nanjing municipal government, invested in constructing a comprehensive aquaculture tailwater treatment facility in 2019. After treatment, the tailwater can meet Level III drinking water standards.

Rice-crayfish rotation and circular cultivation: To enjoy the benefits of “crayfish-fertilized rice and rice-protected crayfish[7]” while ensuring fully mechanized rice production, the farm adopted a rice-crayfish rotation model. Due to the sensitivity of crayfish to pesticides and fertilizers, pesticides cannot be employed and the use of fertilizers must be restrained[8], ensuring a natural and non-polluting system[9]. Although the yield is half that of traditional rice cultivation, the selling price of the ecologically grown rice can be 5-8 times higher, resulting in a substantial profit increase.

(2) Main achievements of youth-led sustainable agricultural mechanization innovations:

Transforming agricultural production: With young individuals returning to agriculture, the most noticeable change has been the transformation of traditional agricultural production through technological innovation. Agricultural production has shifted from manual labor to mechanization, and further towards automation and unmanned operations; management has moved from on-spot to online, transitioning from extensive to detailed, digital management. Empowered by IT and IoT, managers can remotely monitor field or pond conditions and machine operation quality, and then schedule various tasks scientifically and precisely. For instance, in Case One, satellite remote sensing data can monitor crop maturity. When 95% of the wheat is detected as mature, mechanized harvesting can commence. Once wheat harvesting is completed, the precise timing of rice planting can be based on meteorological monitoring, maximising yields and effectively addressing challenges brought by weather changes. In Case Two, unmanned feed boats replace the traditional “one-person rowing, one-person feeding” method, making agricultural production neither dirty nor arduous.

Improving agricultural production efficiency: One of the primary outcomes of youth-led mechanization innovation is higher production efficiency while freeing up agricultural labor. In Case One, by using drones to spread rice's jointing-booting fertilizer, one machine can cover 300 mu a day. One individual can operate two drones simultaneously, whereas traditional manual fertilizing can only cover about 50 mu per person daily, making machinery 12 times more efficient. Compared to regular mechanization, Run Guo Farm, using smart machines and big data, has increased the management capacity from 200 mu per person to 300-500 mu, further reducing labor by over 30%. Similarly, in Case Two, one individual can remotely monitor all water conditions without manual patrolling via smart water quality monitoring equipment, improving management efficiency by at least threefold.

Achieving cost-effective and efficiency in agriculture: One of the challenges youth-led mechanization innovation addresses is improving resource utilization rates for more economical and profitable farming. For example, in Case One, the young farmer, using big data and professional knowledge, calculated the exact amount of materials needed for each field and used smart machines for precision operations. Scientific estimations show a 30% improvement in water utilization, a 15% increase in fertilizer use efficiency, and an over 20% reduction in pesticide use, boosting rice yield from 450-500 kg per mu to 550 kg, an average yield increase of 9% and a per-acre profit increase of 28%. In Case Two, compared to traditional farming, which requires 1,500 yuan/month for manual feeding and care and 100-400 yuan/day for temporary laborers for patrolling, nighttime surveillance, and fishing, the farm saved over 30% in labor costs with mechanized equipment and digital infrastructure, also avoiding risks and losses due to delayed activation of oxygenation equipment in fishponds.

Elevating green agricultural standards: Youth-led mechanization innovation helps improve efficiency and benefits and promotes ecological balance and sustainable green development. Young farmers use more efficient agricultural machinery for operations, ensuring high utilization rates of fertilizers, pesticides, and feeds, thus reducing pollution to soil and water. They actively control pollution, like using the 4R technology in Case One to manage non-point source pollution and setting up wastewater treatment facilities in Case Two for standard discharge. Additionally, they explore ecological farming techniques for circular agriculture, like producing high-quality rice with an ecological certification in Case One and producing rice that meets natural and non-polluting standards through rice-crayfish rotation in Case Two.

Driving increased income to surrounding small farmers: Through agricultural mechanization innovation, young farmers achieve online and smart farm management, diversify their operations and drive the surrounding small farmers to increase their income. For example, in Case One, Run Guo Farm boosts the income of neighboring farmers by developing contract farming and providing social services. The farm conducted contract planting of 3,000 mu of low GI rice (a rice variety suitable for diabetics with a small postprandial blood sugar response), ensuring high-quality development by providing unified seeds, technological protocols, full mechanization services, unified purchasing, and branding. They established a "full mechanization + comprehensive farming" service center, equipped with over 300 sets of various agricultural machines, and a daily operational capability of 5,000 mu. They built a large-scale grain drying center with a single drying capacity of 1,500 tons. Over seven years, the cooperative has enabled 10,960 small farmers to earn nearly 13 million yuan more.

2.2.2 Precision agriculture

Precision agriculture is an agricultural management strategy that optimizes using inputs and resources through information. Since the 21st century, the technological advancement of precision agriculture has included digital devices and artificial intelligence robots: the former improves agricultural problem diagnosis and decision-making through digital tools or equipping motorized equipment with digital tools for more accurate execution; the latter is operated by machines for diagnosis, decision-making, and execution, with human oversight and maintainance.

According to FAO flagship publication, The State of Food and Agriculture 2022, agricultural automation facilitates the transformation of agri-food systems [10]. Precision agriculture and adopting small-scale equipment – often more suited to local conditions than motorized mechanization using heavy machinery – can improve both environmental sustainability and resilience to climate and other shocks. The following three cases demonstrate how young Chinese farmers and agricultural scientists carry out precision agricultural production practices through innovative scientific technology.

Case 3:

Young scientists propose a new grain loss reduction scheme: whole lifecycle management of mushrooms

As a nutritious, tasty fungal food in modern life, the market demand and production of edible fungi are increasing yearly. With the diversification of mushroom consumption, waste and loss in mushroom cultivation and sales are becoming increasingly severe.

In the 2022 Youth Innovators for Food Loss Reduction campaign, a team of young scientists from the Agricultural Information Institute of Chinese Academy of Agricultural Sciences (CASS), proposed a solution to reduce losses and waste in the entire lifecycle of mushroom production based on AI technology. This solution comprises an automated intelligent software and hardware system, with primary functions including: 1) Detecting pest-infected areas during the early stage of mushroom growth using deep learning visual algorithms and identifying their species, which helps in targeted treatment to eliminate pests. 2) Automatically inspecting and multi-standard quality grading mushrooms, dividing the mushrooms on the shelf into different grades based on various criteria, and tailoring harvest strategies accordingly. 3) Using a mushroom posture analysis algorithm and suction cup picker robot, mushrooms are harvested without damage. After harvesting, the mushroom cap is packaged, and the stem is recycled and processed, maximizing mushroom utilization. 4) Sales channels are finely managed based on the aforementioned quality grading and non-damaging harvesting. The optimal sales path is determined to achieve the least loss and highest profit using AI big data analysis algorithms.

Currently, the team has developed the first generation



The first-generation intelligent mushroom picking robot developed by the young scientist team from Agricultural Information Institute of CASS.

of intelligent mushroom picking robots and formulated a work plan for mushroom lifecycle management loss reduction. With the support of the Chinese Academy of Agricultural Sciences, the team will comprehensively promote regional extension of the project cooperation.

Case 4:

Young farmers team transforming fields: Neixiang county wheat-corn rotation digitalized crop-cultivation cycle demonstration zone

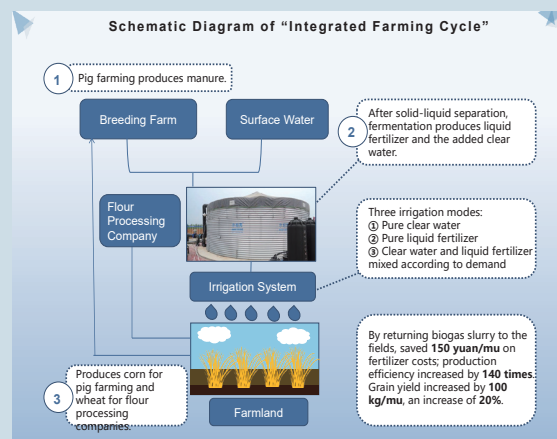
Neixiang County is located in Nanyang City, Henan Province, a traditional wheat-producing region. The town of Guanzhang in Neixiang has rugged terrain, numerous hilly areas, thin soil, and irrigation difficulties. Due to the low technological level of traditional farming, it has been challenging to increase grain yield.

In 2017, fresh out of college, Wu Zukun joined the local pig breeding company, Muyuan Group, researching environmentally friendly recycling techniques for waste materials like pig manure. He combined the company's needs and gradually shifted his research focus from rice paddies to dryland crops such as wheat and corn. He explored the technique of returning biogas slurry to the field, which not only enhances soil fertility but also reduces the use of chemical fertilizers, establishing a “breeding-biogas slurry-green agriculture” integrated circular economy model.

In 2021, Neixiang County, in collaboration with Muyuan Group, initiated the “Digitalized Crop-Cultivation Cycle Demonstration Zone” project. Wu Zukun formed a team of college graduates, including Li Dong, Zhu Mengzhao, Lyu Wenkai, and Zhang Xiaohong, known as the “Post 1990s Team”. They adopted a holistic approach using satellite remote sensing data, drones, multispectral scanning data, and real-time field monitoring systems, investing an average of 5,000 yuan per mu. They focused on improving the water sources, irrigation systems, integrated water and fertilizer systems, and intelligent monitoring systems. They transformed the productivity of fields that were previously



Neixiang County's Wheat-Corn Rotation Digitalized Crop-Cultivation Cycle Demonstration Zone, where corn continues to be processed as feedstock for pig breeding, and wheat is supplied to flour processing enterprises.



The water treatment device Water Tank

subject to adverse weather conditions, low yields, and irrigation difficulties. That same year, they planted their first crop of corn.

The irrigation system in the project area channels quality water from a high-altitude reservoir 20 kilometers away through underground pipes, combined with manure supply from surrounding farms. Using an automated sprinkler system, one person can complete the irrigation of 6,200 mu in 5 days, reducing fertilizer use by more than 50%. In contrast, traditional farming methods require 140 people.



Wu Zukun's "Post 1990s" team

Introducing new machinery and technologies greatly increased efficiency, liberated human labor, and transformed agricultural production from a labor-intensive task to a technically-driven operation, bringing new opportunities and space for rural development.

Today, this young team uses modern technology to cultivate 6,200 mu of grain. From 2021 to 2023, the average yield per acre in the demonstration zone increased from 365 kg to 465 kg, 15% higher than local farmers, bringing both economic and environmental benefits. After project implementation, farmers' income per acre has increased to over 1,100 yuan, a 10% rise compared to traditional farming.

Full of confidence, the team actively coordinates resources to expand into regions like Xichuan and Fangcheng. The team has grown from 5 to 14 members. They plan to achieve two consecutive crops of wheat and corn, increase yield per acre by 50%, and complete an overall transformation of 67,000 mu in 2 to 3 years.

Case 5:

Youth agricultural technology extension: Shunchang county, Fujian province “Science and Technology Courtyard” industry-education-research new integration

Shunchang County is located upstream of the Min River northwest of Fujian Province. Leveraging its resources and comparative advantages, the county has set the goal of developing characteristic industries with the mantra “one grass, one tree, one great saint.” They plan to expand the land area devoted to Juncao (fungi-grass) from 1,650 mu to 4,650 mu and to increase the value chain.

In June 2022, the Shunchang County government partnered with the National Juncao Engineering Research Center of Fujian Agriculture and Forestry University to establish a Science and Technology Backyard - the Shunchang County



Graduate students from Fujian Agriculture and Forestry University conduct research and demonstration on intercropping Juncao with grain crops in Shunchang County.

Rural vitalization Juncao Research and Entrepreneurship Incubation Center. Chief scientists young masters and Ph.D. graduates formed a technology envoy team stationed in the enterprise. Located at the frontline of rural production, Science and Technology Backyard is a technological service platform integrating agricultural technology innovation, demonstration promotion, and talent training. Their zero-distance, zero-threshold, zero-time difference, and zero-cost services benefit farmers and production organizations. They aim to improve production efficiency through technological innovation, enhance farmers' well-being, and facilitate rural transformation and development.

Under the guidance and assistance of young graduate students, Shunchang County has promoted fungal-grass intercropping with crops, Juncao cultivation for edible fungi, fungal-grass farming, and fungal-grass as raw material for panel production enhancing the quality and yield of crops. For instance, nine graduate students have promoted the cultivation of tricholoma giganteum mushrooms using Juncao in various parts of Shunchang, promoting more than 140,000 bags. Two graduate students were involved in promoting bamboo mushroom cultivation using Juncao technology, achieving an 80% utilization rate for forestland, reducing costs by 10%, yielding 160.5 kg/mu (dry) of bamboo fungus from Juncao cultivation, with about 111,100 mushrooms per mu, earning 9,630 yuan/mu.

The technology team further boosted the digitization of Juncao production. The first dedicated digital platform for Juncao, the Smart Juncao cloud platform, is now in use, supporting Juncao S&T promotion, enhancing the industrialization level of Juncao, and providing extensive data support for the development of Juncao ecological management and its value chain.

In the future, young scientists will further assist companies in formulating development plans for the Juncao value chain, providing technological services, conducting Juncao technology training, and leading surrounding farmers in joint development. Shunchang County will rely on the Science and Technology Backyard to promote deep cooperation between the government, universities, and enterprises, drive the translation of technological achievements, and extend the Juncao technology and industrial chain to surrounding areas.



Graduate students from Fujian Agriculture and Forestry University promote the cultivation of tricholoma giganteum mushrooms in Shunchang County.



Smart Juncao cloud platform

2.3 Youth technological innovation in agricultural production: China's experience and inspirations

Agricultural development harbors vast potential for poverty alleviation. The application of new agricultural technologies

provides infinite possibilities for transforming agricultural production methods and operational modes, offering expansive development opportunities for young innovators and entrepreneurs.

Currently, youth innovation in agricultural production faces challenges, including a lack of operational funds; considerable capital input is required for land transfer, infrastructure construction, agricultural machinery purchase, and agricultural input purchase. There is a shortage of professional talent, including high-quality agricultural production management personnel, intelligent agricultural machinery operators, and equipment maintenance personnel. Additionally, supportive policies are insufficient; policies to promote industrial development and entrepreneurship are not yet well-established.

This chapter summarizes young people's unique experiences and characteristics in agricultural production innovation and entrepreneurship, aiming to provide references for other developing countries.

Promote technology-driven approach: Accelerate the construction and availability of informatization infrastructure for agriculture and rural areas, promote the accelerated integration of agricultural mechanization with sensing, navigation, positioning, and other technologies, and enhance the intelligence level of agricultural machinery.

Provide greater policy support: Establish and improve industrial support measures, introduce policies and measures more conducive to youth innovation and entrepreneurship, and encourage the application of new technologies.

Enhance integration of industry-university-research: Strengthen the technological research and development of agricultural mechanization, accelerate technological integration, promote the integration of industry, university, and research in the agricultural production sector, build intelligent agricultural management expert systems, and enhance intelligent decision-making capabilities.

Strengthen efforts in education and training: Strengthen capacity-building, enhance the applications of new technologies in the agricultural production field among young practitioners, increase the intensity and scale of education and training investments, and accelerate the application and promotion of new technologies and models.

Chapter 3: Empowering youth entrepreneurship with technology, promoting smallholder farmers' access to market

3.1 Overview

Youth is a leading force to enhance agricultural value chain development through innovation and entrepreneurship. It is critical for smallholder farmers to gain more access to market in the process of rural development and transformation. In this journey, youth development and capacity building are fundamental for overall rural revitalization and the progress of rural development.

In terms of an entrepreneurship establishment, rural youth, who return home to build their own businesses, could not only help achieve personal growth, but also support to elevate developmental standards through technical empowerment, driving rural value chain development. An increasing number of rural youth is seen returning home to start businesses to apply their acquired technical knowledge and managerial skills from urban experience to rural value chain development. In association with rural infrastructure advancement, the rural youth could boot innovate agricultural business models with innovations, establish local brands even through the internet, gain market recognition, promote local agricultural value chain development, and in turn increase income.

Empowering rural transformation through “study” and “technology” will be the “new normal” for agricultural value chain development. By combining agriculture with field study, back-to-hometown young entrepreneurs proactively promote and introduce new crop varieties and techniques, to strengthen rural value chain, explore local specialties, foster local brands, and propel rural transformation.

The development of rural areas still requires talents who know well agricultural production, agro-business management, and agricultural technologies. Rural vocational education is under vigorously development, which focuses more on training specialized rural talents, empowering agriculture and rural development with technology, so as to bridge the gap of rural labor shortage and to achieve more production efficiency. These are key components for rural youth empowerment.

The capacity building for rural youth, oriented by “demand-driven and improving needed skills” has been widely implemented in China. Rural youth development, focusing on key groups such as vulnerable households who are at the brink of poverty line, households who still need support to sustain family income, or migrant households with less stable income, has been widely taking place to trigger motivation for growth and help more rural youth in attaining stable job opportunities.

In terms of rural entrepreneurship supporting policies, rural youth pay more attention their business plans with a long-term vision. Emphasis is more given on market potential for further development. Aside, there are booming needs for business loans, projects design, and market information service, business management training, favorable tax exemption, and the igniting the roles of farmer cooperatives and association.

3.2 New farmers driving youth entrepreneurship

Talent is the “primary resource,” and agricultural and rural science and technology talents are the foundation for strengthening and enriching agriculture. Many projects, mainly targeting young “new farmers,” have emerged, supporting and encouraging more capable young talents to boost scientific and technological agriculture through entrepreneurship.

3.2.1 New professional farmers

The definition of modern professional farmers has evolved with China’s era of development and practical exploration. The Chinese government proposed to vigorously cultivate new types of professional farmers a decade ago. Some examples that emerged along with digitalization and technical innovations are agriculture digital technicians, agromachinery agents, drone operators, consultants for new types of agricultural business, and farmer live streamers. Other vocations related to green development include agricultural business manager, plant protection technician, forestry pest control operator, and biogas technician.

Besides their traditional identity, new professional farmers also need to have the following characteristics:

- They are market entities, fully entering the market and maximizing returns through all possible choices.
- They have a high level of stability, taking farming as a lifelong profession, and there's there's a succession plan.
- They possess a high sense of social responsibility and modern concepts, understanding culture, technology, and management, and are responsible for the ecology, environment, society, and future generations.
- They have high stability, considering farming as a lifelong occupation, with successors;
- They possess a strong sense of social responsibility and modern concepts, not only having culture and technical know-how and business acumen but also behaving responsibly towards the ecology, environment, society, and future generations^[11].

In January 2017, MARA issued the 13th Five-Year Plan for the Cultivation and Development of New Professional Farmers, clearly identifying the development goals, main tasks, key projects, and specific measures for cultivating new professional farmers during the 13th Five-Year Plan period (2016-2020).

The purpose of training more professional farmers who eagerly adopt agriculture as a profession, understand technology, and are good at management is to promote rural economic and social development, enrich farmers, improve farmers, support farmers, make agricultural operations profitable, turn agriculture into a promising industry, and make farming a respectable profession.

Modern professional farmers differ from traditional farmers. Choosing to be a modern professional farmer is a proactive profession.

- From an economic perspective, it promotes the optimized allocation of labor resources, sustainable development in agriculture and rural areas, participate in the upper value chain and integrated development of urban and rural areas.

- From political and social perspectives, respecting individual choices stimulates the enthusiasm and creativity of farmer entrepreneurs and aligns with the development concept of innovation, coordination, openness, and sharing.

Case 6: Rural CEO program: solving the challenges of systematically nourishing young management talent

In recent years, with the emergence of various new business models such as agritourism, there is an urgent need for a large number of talented young people in rural areas to aggregate village resources, fill the gap of management shortcomings, introduce urban consumer trend into the countryside, and establish effective trust between villagers and the market.

In November 2021, the National Rural Vitalization Research Institute of China Agricultural University (CAU), in collaboration with Tencent, launched the Rural CEO Program to address the shortage of rural management talent and the gap in systematic training. CAU leverages its intellectual resources in agriculture and rural management, providing tailor-made training for rural professional managers in a mentorship format, filling the management capacity gaps of smallholder farmers. Conversely, Tencent provides financial support and internet channel backing, ensuring smallholder farmers can connect with the bigger market.

The program recruits participants from various backgrounds, including grassroots rural officials, returning entrepreneurs, managers of rural cooperatives, new college graduates, and other young individuals committed to rural development. With the support of governments at all levels, it aims to explore a complete, effective, and feasible training system and institutional plan for rural management talent in three years, delivering high-quality professional managers to the countryside.

The collaboration between the Rural CEO team, CAU Ph.D. team, and the professional mentor group combine their respective strengths through learning, sharing, and action. Together, they delve into the key elements for sustainable rural development and jointly explore the ways for rural business and industry development.

Li Xiaoyun, Chair Professor of CAU, stated that after a year of exploration, the project has produced a comprehensive set of educational products for training Rural CEOs, including a systematic plan for training Rural CEOs, a standardized system for the entire process of the Rural CEO a group of leading Rural CEO talents, and a set of typical Rural CEO practical case studies.

The inaugural training session consists of four stages: 20 days of intensive learning, two months of village-based training, six months of on-the-job training, and a final

thesis defense. Then, the joint project team recommends outstanding participants to apply for Tencent's 12-month entrepreneurial fund, supporting their startup efforts in designated or self-selected villages.

In the first cohort, 46 participants successfully graduated. Preliminary data shows that of these, 31 participants, before and after joining the course, have increased their total revenue (including village cooperatives and village



5+N training model for rural professional managers

enterprises dominated by villagers) from around 5.5 million yuan to over 37 million yuan.

Huang Jin, a student from Jingu Village, Langzhong City, Sichuan Province, is among the best. In 2017, he resigned and returned to his hometown to lead villagers in planting figs. Before participating in the Rural CEO Plan, the cooperative's annual revenue was over 700,000 yuan, assisting 35 households comprising 105 people. The cooperative's planting area exceeded 100 mu, but it only cultivated figs, and both the scale and outreach were relatively small.

Under the guidance of mentors and through exchanges with other participants, Huang Jin found new ideas for industrial development. He adopted the model of an agricultural consortium to unite several local agricultural producers, expanding the product range and scale to include five cooperatives and seven family farms. From July to October 2022, the consortium he managed sold a total of 2.7 million yuan, aiding 368 households with 1,436 people.

Over the past year, the program has had a wide-ranging social impact and a positive institutional influence: many local governments are considering integrating the Rural CEO training into their rural vitalization frameworks. The second phase of Rural CEO Program was launched in May 2023. It established partnerships with Kunming, Zhaotong, and Qujing cities of Yunnan Province, aiming to promote the results of the first phase to these three locations. The program is exploring the combination of the innovative training system with a local training-recruitment mechanism, ensuring that young talents can stay and fully utilize their skills locally. This aims to systematically address the shortage of young management talents in underdeveloped rural areas.



Huang Jin, an exemplary participant from Jingu Village, Langzhong City, Sichuan Province, found new ideas for industrial development through mentor guidance and interactions with fellow participants. He collaborated with several local agricultural entities in an agricultural union, expanding product categories and extending the scale to five cooperatives and seven family farms.



On February 2023, during the summary conference of the first phase of Rural CEO Program, Yunnan Zhaotong College announced the establishment of China's first Rural CEO Institute.

3.2.2 Head Geese project

Talent prospers, and so do villages. Young individuals are infusing agriculture with new energy through modern technology, developing modern agricultural projects tailored to local conditions, and fostering a team of new farmers who are tech-savvy, good at business, and capable of prosperity. Empowering rural development with technology, these young entrepreneurs are working the in the land and dedicating themselves to rural construction development and have

become the “head geese” spearheading rural vitalization.

The Head Geese project was launched in 2022, receiving active responses from various provinces and cities, each implementing their local versions of the project to support rural vitalization. The government of Shaanxi Province, in collaboration with Northwest A&F University, selected over 500 top-tier faculty members, professional mentors, industry mentors, and policy lecturers from the university to undertake cultivation tasks in industries such as pork, apples, sheep and beef, kiwifruit, dairy products, poultry, and grapes for the 2022-2023 period, totaling 289 individuals; Hebei Province completed the cultivation of 700 “head geese” during the 2022-2023 period, and plans to increase this number to 1,000 in 2023. Shandong Province’s Head Geese project relies on Shanghai Jiao Tong University, Shandong Agricultural University, and Qingdao Agricultural University, focusing on six industry topics: grain, vegetables, fruits, livestock, agricultural social services, and rural tourism, with a plan to cultivate 1,000 “head geese”.

Case 7: Women empowerment: driving the revitalization of Dongbao Tribute Rice

Jiange County’s Dongbao Town in Sichuan Province has a long history of rice cultivation. The rice produced here is known for its strong glutinous quality and good taste. However, due to traditional cultivation and sales methods, rice yields were low, sales avenues were limited, and the local villagers’ incomes were similarly low. In 2015, 26-year-old Deng Xiaoyan gave up a high-paying job in the coastal region to return to her hometown and embarked on a mission to promote Dongbao Tribute Rice beyond the mountains. In her first year, she introduced perennial regenerative rice. Unfamiliar with rice cultivation techniques and maintenance, her initial efforts failed. Determined to learn from the setbacks, she ventured into the fields with local farmers, engaged agricultural experts, selected better-quality rice varieties, and employed advanced plastic mulching seedling cultivation techniques. The following year, Deng’s rice trial yielded an abundant harvest, with profits per acre increasing by 50%-60% compared to before.

Through continuous exploration and practice, Deng established an agricultural company, taking Dongbao Town’s Shuangxi Village as a demonstration for scaled cultivation. Good rice deserves a reasonable price, and capturing expanding market. Today, in Deng’s live-streaming sessions, there are over 60 varieties of local and other remote mountain area agricultural products, with annual sales reaching over 5,000 tons.

The internet has given the hidden gems in the mountains’ the wings to fly high. Live streaming and short videos have become the “new farming tasks” for Deng. In her videos, there are scenes of arduous farm labor, grandparents carrying baskets over mountains to market, through newly constructed houses and roads in the village... her videos showcase the fresh transformations in today’s countryside.

Presently, Deng has driven the large-scale cultivation of rice in Jiange County, covering an area of over



Deng Xiaoyan (center) live-streaming in the rice fields

10,000 mu, covering 8 townships and 19 villages, and increasing income for 2,356 villagers from 728 households. Under Deng's influence, more and more young people are returning to their hometowns. An integrated agricultural service center, founded by post-1995 born college students who returned to start their businesses, is launched in May 2023. This center, offering services such as seedling cultivation, drying, storage, and comprehensive agricultural services, aims to support comprehensive grain and oil production for over 10,000 mu across six villages.

Case 8: E-commerce platforms empowering young entrepreneurs

As the comprehensive rural vitalization strategy accelerates, Internet + Agriculture is becoming the significant direction for agricultural industrialization. In recent years, e-commerce platforms have consistently empowered rural infrastructure construction and digital transformation, directly connecting producers and consumers, effectively opening up the upward channel to markets for agricultural products. Leveraging their supply chain advantages, they provide services like sales and logistics for rural areas, further refining the distribution system for agricultural products.

On December 2, 2021, Pinduoduo released the 2021 New Farmer Growth Report. The report indicates that on the Pinduoduo platform, post-1995 "new farmers" have become a new force driving the rise of agricultural products. As of October 2021, there were over 126,000 such "new farmers" on the platform, accounting for over 13% of the agribusinesses. The report highlighted that these post-1995 "new farmers", who grew up in the era of mobile internet and generally come from rural areas, possess higher education, understand business and management, and excel at integrating upstream and downstream industries. They have become a fresh force pushing for comprehensive rural vitalization and modernization.

Behind Pinduoduo's growth in many key indicators lies its source of energy: under the boost of technology, the upward mobility of agricultural products is changing the traditional agricultural ecosystem, capturing the hearts of hundreds of millions of young users. Young consumers are establishing typical consumption patterns through Pinduoduo.

In addition to boosting consumption, Pinduoduo continues to invest in the supply chain of new agricultural entrepreneurs, bringing e-commerce training to the countryside. They systematically move forward practical e-commerce training for rural talent through collaborations with government departments and university faculties. On June 11, 2020, in Yunshan Village, Lancang County, Yunnan, after eight months of theoretical and practical training led by the Chinese Academy of Engineering and supported by Pinduoduo, the first class of 60 students from the Science and Technology Poverty Alleviation E-commerce program graduated. This new cohort talent opened new sales paths for Lancang's unique agricultural products.

On August 20, 2020, the Haixi Quality Goods Online e-commerce training program was launched in collaboration between the Haixi State Commerce Bureau, Zhejiang's Aid Command for Qinghai, and Pinduoduo. This program has attracted many e-commerce operators interested in the quality agricultural products from the Qaidam Basin, with over 9,000 participants engaging in various training modes.

Pinduoduo also initiated the Farmland Cloud Group and Hometown Quality Products Live Streaming plans, supporting post-1995 “new farmers” and encouraging well-educated, business-savvy young talents to return to their hometowns to start businesses.

In the agricultural product distribution sector, Pinduoduo leverages big data, cloud computing, and distributed AI technology to implement the Farmland Cloud Group plan to facilitate the upward movement of agricultural products. By harnessing big data, cloud computing, and distributed AI technology, they aggregate scattered agricultural capacity and demand onto the cloud, forming a virtual national market to achieve production based on demand. The goal is to optimize intermediary transactions, reduce the sales cost of agricultural products, shorten the circulation time of agricultural products, ensure that produce goes directly from the field to consumers’ baskets and fruit plates, and reduce the use of various preservatives.



In Pinghe County, Zhangzhou City, Fujian Province, Chen Zongyou, born in 1995 and pictured on the far right, is a second-generation wholesaler. In 2017, he returned to his hometown to sell grapefruits in collaboration with his father, achieving sales of 50 million yuan in three months and successfully transitioning the family’s wholesale business.

3.2.3 Youth entrepreneurship supporting rural vitalization

Youth represent society's most vibrant and dynamic force and play an essential role in returning to their hometowns to start businesses and rejuvenate rural areas. Many young returnees have received good education and have market experience. They possess a broad perspective and active thinking, understand market demands, are adept at nurturing high-quality agricultural products, and extend the industrial and value chains. Simultaneously, these young entrepreneurs are eager to learn and research. As they grow personally, they showcase the opportunities in rural development to others, attracting more individuals to participate in rural vitalization. Young people returning to start businesses in rural areas are expanding rural industries, accelerating the convergence of capital, technology, and talent to the countryside.

Industry Prosperity ranks first in the rural vitalization strategy. China’s government emphasized continuous support for industries in poverty-alleviated areas, making up for technological, facilities, and marketing deficiencies, and promoting industrial upgrading. Industry prosperity also requires continuous technological innovation, rapid conversion of technological achievements, and a strengthened talent foundation in technology to play the driving role of technology continuously. This approach injects vigorous momentum into industrial development, providing continuous intellectual support for rural vitalization.

Supporting youth entrepreneurship, especially through technological innovation projects can further enhance the role of technology in promoting rural industrial development. Many visionary youth entrepreneurial projects employ a specific agricultural or novel technology and adopt a more open mindset at the business model level. They establish projects more conducive to scalable promotion, bringing enormous potential for self-sustaining, sustainable rural development.

Case 9: Shared agriculture + rural tourism enhancing agricultural added value

In the continuous mountains of Longxing Town, Longnan City, Gansu Province, a broad concrete road leads to the highest point where a village that seems like a hidden gem -- Huamapingtao Village stands on this flat and fertile land atop the mountain.

Taking advantage of the natural ecological benefits, village officials led villagers in a collective effort to transform the village's appearance, constructing a camping base, shared farm, and other facilities to develop sightseeing tourism. They established a shared small vegetable garden and operate under two modes:



Aerial view of Huamapingtao Village

Self-planting mode: Each plot is 16 square meters, with a rental fee of 298 yuan, available from April to November each year. Renters are provided free seedlings and organic farm fertilizers needed for their plots. Consumers can borrow farming tools at zero cost (including watering, fertilizing, weeding, thinning seedlings, and setting up supports).

Managed mode: Each plot is 16 square meters, with a rental fee of 398 yuan, available from April to November each year. Free on-site planting guidance and free seedlings and organic farm fertilizers are provided for the plot. Complimentary management services (including watering, fertilizing, weeding, thinning seedlings, and setting up supports) are available, but delivery is not included.

The picturesque rural scenery has attracted many urban residents who are eager to experience pastoral life.

As the village continually improves, it has also nurtured a large group of new farmers. Tian Junming, a post-1990s university graduate who returned to his hometown to start a business, is a well-known TikTok influencer in and around the village. After returning to his hometown last year, he leveraged his video-making skills to promote his hometown on short video platforms, sharing snippets of rural life.



The shared farm in Huamapingtao Village



Tian Junming shares rural life on short video platform

Longxing Town actively explores the shared courtyard economy mode. By beautifying and renovating farmer's houses and planting various fruits, vegetables, and other crops around their homes, they have paved a way to boost added value, increase farmers' income, and improve living environment. This year, the town has added three agritainment venues, established two outdoor camping bases, added 86 new livestock farmers with over 4,000 various poultry, and introduced over 200 mu of courtyard economic crops. Around 1,600 tourists are attracted, bringing an income of more than 400,000 yuan this year.

3.3 Rural youth entrepreneurship improves smallholder farmer's access to market: China's experience and inspirations

Good policies can provide continuous talent support for comprehensive rural vitalization. For developing countries, drawing lessons from China's process of promoting youth development in rural vitalization, they can consider the following:

- **Cater to new professional farmers and young entrepreneurs returning to their hometowns.** Explore projects suitable for the developmental needs of young entrepreneurs, encouraging youth to develop specialized industries and start their businesses through family farms, farmer professional cooperatives, etc., to resonate with industry development.
- **Implement training programs for new-type professional farmers.** Offer practical technical training for high-quality farmers, family farm operators, and rural entrepreneurial innovators, enhancing young people's entrepreneurial abilities.
- **Encourage young people to return to their hometowns for pro-poor entrepreneurship, formulating preferential entrepreneurial policies.** Cultivating local entrepreneurial talents to secure pro-poor and wealth creation development.
- **Public sectors should provide entrepreneurship and employment consultation and comprehensive services.** Transform employment concepts, skills, methods, etc., build communication platforms, and elevate entrepreneurial levels and abilities.

Chapter 4: Financial support for youth entrepreneurship and innovation in rural areas

4.1 Overview

Vigor, innovation, and adaptability are characteristics of young people. They are eager to try new techniques, business models and managerial concepts. This spirit of innovation is a critical driving force for economic growth. By providing them with adequate financial support, their entrepreneurial enthusiasm can be ignited, promoting the upgrade and transformation of the entire economic system.

However, new enterprises established by young people often have a shorter duration, weaker risk resistance, and, combined with information asymmetry between banks and businesses, may face challenges, such as pricing difficulties and high-interest rates, when seeking conventional financial support. Compared to urban areas, there are fewer financial institutions in rural areas. They lack a variety of financial products and services, and their financial infrastructure and digitization are relatively lagging. Thus, financial support for youth entrepreneurial activities in rural areas becomes especially crucial.

The financial support that China offers to young entrepreneurs in rural areas can be summarized as follows: first, financial resources are made available to help improve key infrastructure in rural areas, providing industrial space for young returnees to start their businesses. Secondly, providing necessary funds to help young entrepreneurs overcome financial bottlenecks, promote local employment. Thirdly, entrepreneurs receive training and consultation in their interactions with financial institutions, which helps them maintain financial discipline, enhance entrepreneurial capabilities, open more business opportunities, and promote diversified local industry development.

4.2 Providing financial support for building rural infrastructure and industrial development space

A certain level of agricultural infrastructure and ample industrial development space is a prerequisite for young people's involvement in rural development. Adequate access to infrastructures can reduce the operational costs of young entrepreneurs, improve agricultural production efficiency, and provide easy access to potential customers. Moreover, a reasonably planned industrial space that exploits local advantages can attract young, educated individuals to develop their ventures in rural areas. Policy financial institutions in China have provided financing support for significant and pioneering rural infrastructure and industrial spaces, laying a solid foundation for the employment, entrepreneurship, and joyful endeavors of young people in rural areas.

Case Study 10: Financial support for high standard farmland construction: Agricultural Development Bank of China's Shangshui county project in Henan province

The construction of high standard farmland entails the renovation and upgrading of a portion of the permanent basic farmland to improve its quality, output capacity, disaster resistance, and resource utilization efficiency, prioritizing

these lands for grain cultivation. In China it involves land consolidation, soil improvement, infrastructure construction, and crop structure optimization, requiring substantial financial input. State-owned policy banks and commercial banks play a significant role in financing high standard farmland.

Take the Shangshui County high standard farmland construction project as an example. The project established 206,200 mu of high-quality farmland demonstration zones across 19 townships, with 8,988 mu of reclaimed rural construction land. The project merged fragmented fields and combined traditional agriculture with modern farming, irrigation, and management techniques, substantially upgraded agricultural production path. The Henan branch of the Agricultural Development Bank of China provided a loan of 500 million yuan for this project, leading efforts in lending, project construction, subsequent maintenance and operation, integrating the industrial chain, and promoting large-scale, intensive agricultural development. They also ensured that local economic organizations, grain farmers, and operating entities adhered to the principle of “those who use, manage,” providing the long-term use and efficacy of high-quality farmland and addressing the post-construction management issues.

Optimizing farmland ecological environment. An integrated, efficient system of farming, irrigation, and transportation was established by amalgamating fragmented plots into larger, interconnected fields, constructing 2,134 new wells and well protection platforms, installing 675 integrated water and fertilizer facilities, 3,910 water taps, and 53 fixed sprinklers, lining 8.14 km of ditches, and constructing 7.27 km of mechanized roads. After the farmland transformation, soil quality will increase by at least one grade, leading to a 10%-20% increase in yield.

Strengthening agricultural technology support.

Following the “Five Transformations” practice of standardization, modernized equipment, intelligent application, scalable operations, and planned management integrated with the modern smart agriculture linked with the Internet, an upgraded version of high-standard farmland is constructed. Many in-field weather, soil moisture, and pest control monitoring sensors are installed within the Shangshui County high-standard farmland demonstration area, realizing real-time monitoring of seedling conditions, diseases, pest conditions, and soil moisture. Advanced technologies such as big data, cloud computing, and agricultural drones are utilized to control fertilization and irrigation remotely. The mechanization rate of plowing and harvesting reaches 100%, and the irrigation assurance rate exceeds 98%, significantly enhancing agricultural productivity.



Aerial view of Shangshui County's high-standard farmland



Shangshui County's high-standard farmland demonstration area integrates big data, cloud computing, and other technologies into agricultural cultivation.

Establishing operational mechanism to Benefit Farmers. By integrating the construction of high-standard farmland with large-scale operations, a state-owned enterprise + professional agricultural company + farmers benefiting mechanism is established. Through land trusteeship, professional agricultural companies and large grain growers work hand in hand with farmers. The model of “small farmer, small production” is transformed into a “contiguous, scalable, intensive” production model. The economic benefits of farmland increase, with farmers earning approximately an additional 300 yuan per mu annually, achieving a win-win for the government, banks, and enterprises.

4.3 Financial support for young agricultural entrepreneurs

Providing loan support for rural youth entrepreneurs, especially for rural youth and college graduates, is crucial. The government, in collaboration with financial institutions, developed financial products, offering startup guaranteed loans and other means to provide entrepreneurs with more convenient financing channels. Such policies aim to address the initial capital issues of startups, reduce the entrepreneurial threshold, and promote innovation and entrepreneurial activities.

Case Study 11: Financial product innovation Youth Business Startup Loan eases agricultural startup capital stress

The Youth League of Hubei Province, in collaboration with relevant departments and commercial banks, launched the Hubei Youth Business Startup Loan financial support project, providing young entrepreneurs with interest-subsidized financial loan support.

The loan targets are young entrepreneurs under the age of 45 in Hubei or the micro-enterprises they have founded. Local youth league organizations actively mobilize, serve, and widely recommend eligible young entrepreneurs to apply for the project. The interest rate for the Youth Creation Loan does not exceed the Loan Prime Rate (LPR) set by the People’s Bank of China + 250 base points. The interest on the loan below LPR-150 base points (approximately 2.15%) is borne by the borrower, and financial subsidies from various government financial departments support the remaining part.

Borrowers include young individuals under 45 years old or their small and micro-enterprises that are initiating businesses in Hubei. The local youth league organizations are actively involved in mobilizing, serving, and recommending eligible entrepreneurial youth to participate in the project.

The interest rate for the Youth Business Startup Loan



In September 2020, the first phase of the Hubei Youth Business Startup Loan was initiated.

does not exceed the People's Bank of China's LPR (Loan Prime Rate) + 250 basis points. The borrower bears the interest part below LPR - 150 basis points (approximately 2.15%), with the remaining interest subsidized by fiscal departments at various levels.

For example, traditional tea gardens mainly relied on manual laborers carrying backpack sprayers for pest and disease control, which was costly in terms of labor, inefficient, and often ineffective. Wang Guangjun once witnessed an older worker fall and fracture his pelvis while spraying pesticides due to slippery ground, which deeply impacted the young Wang Guangjun and led him to resolutely decide to change these outdated pest control methods through a technology-based startup.

Wang Guangjun recalled that the 1-million-yuan Youth Business Startup Loan, facilitated by the Youth League Committee of Chibi City in 2021, enabled him to kick-start his business project and navigate a developmental crisis successfully. To further foster the development of technological agriculture in the locality, the Chibi Youth League Committee also assisted him in establishing the Chibi City Youth Drone Flying Association, primarily composed of local young technicians and new farmers from the post-1980s and 1990s, thereby providing robust support for promoting smart agriculture in the area.

4.4 Entrepreneurial activities to ignite innovative potential

It's important to set up resource matchmaking and entrepreneurial incubation platforms to provide comprehensive one-stop services. This approach effectively links entrepreneurs with funds, technology, markets, and other resources, reducing information asymmetry and increasing the rate of entrepreneurial success. Government and financial institutions not only provide financial support but also serve as organizers and coordinators, promoting a comprehensive upgrade of the entrepreneurial ecosystem.

Case Study 12: Business plan selection + PPPP joint investment realizes youth agricultural dreams

Guang'an District in Guang'an City, Sichuan Province, primarily depended on traditional agriculture to support local farmers' livelihoods until it was officially declared poverty-free at the end of 2019. Tang Wenwen, a young woman born and raised in Guang'an and part of the post-1985 generation, harbored dreams of bringing prosperity to her hometown. Two years after completing her postgraduate studies, she returned home and started a business. In 2017, together with like-minded partners Wang Xiaoping and Xiong Hailin, they founded the Chushan Nonggu Agricultural Cooperative, aiming to modernize their hometown's traditional agriculture. They focused on developing plums as the leading industry, cultivating various fruits and vegetables, and raising free-range chickens and aquaculture. However, the reality was apparent from breaking away from traditional farming methods to developing a modern agriculture, there was an initial need for advanced equipment investment. "Those machines would cost at least one to two million yuan, which is by no means a small amount for us entrepreneurs," Tang recalled.

Furthermore, no formal management and financial systems were established within the cooperative, leaving

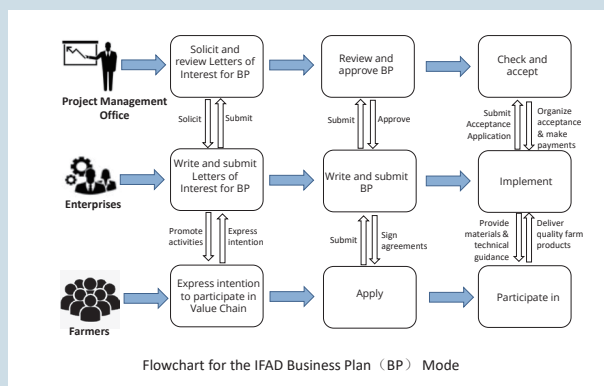
members in the dark about their personal interests and benefits. The agricultural production cycle for the cultivated products was long, and the benefits distributed to the smaller farmers were limited, constraining the sustainable development of the cooperative.

In 2020, Tang Wenwen learned that IFAD was soliciting business proposals to promote the integration of small farmers with modern agriculture. She took the initiative to submit the cooperative's business plan to the Sichuan Provincial Project Management Office for IFAD's Innovative Poverty Reduction through Agribusiness Development Program. After a review, the project received a 1.5-million-yuan fund from the program, which, following the PPPP (Public-Private-Producer-Partnership) model, was used as a joint investment to the business plan. The loan funds were converted into shares for the farmers within the cooperative, further promoting its development and establishing a value chain.

Breaking through financial constraints and using project funds to build a 200-mu standardized plum planting base, coupled with the enhancement of modern agricultural equipment, Tang Wenwen saw a leap in Chushan Nonggu's production efficiency. To ensure that technology and practice progress hand in hand, IFAD invited institutions including the Sichuan Academy of Agricultural Sciences to provide villagers with technical guidance and in-depth training, helping the cooperative optimize construction content and beneficiary targets. Liu Rujun, a farmer who participated in the training, emotionally remarked, "I feel the training was even more serious than my study in school."

However, what delighted Tang even more was that such transformation was not limited to the production process. With the assistance of the IFAD program, the cooperative was supported in adopting the smallholder farmer + cooperative + agricultural supermarket linkage operational model and developing the sales channels for products. The cooperative further combined ecological farming with tourism, forming a new agricultural model of "production + experiencing + picking." Fully leveraging her computer expertise, Tang built an ERP platform for farm management and established a supermarket sale sorting system, forming a complete production-supply-sales value chain.

The establishment of a supermarket and an ecological farm also provided numerous job positions for villagers. In just a few years, the cooperative grew from its initial 20 households to the current 55 members, successfully realizing an average dividend of 2,137 yuan for members and an even higher average dividend of 2,653 yuan for members who



IFAD business plan Implementation process



Cooperative members attend ecological farming training in December 2022.

were previously recorded in the poverty-registration system.

From the entrepreneurship of three college students returning to their hometown in 2017, to the subsequent joining of 15 passionate youths, this valley has gathered an unstoppable force of youth.

Tang Wenwen (center in white) talks with cooperative members.



4.5 Financial support for youth entrepreneurship and innovation: China's experience and inspirations

The Chinese government encourages financial institutions to extend services to rural areas, offering rural residents a more diverse range of financial products and more convenient services, allowing them to participate in various entrepreneurial and innovative activities, thereby promoting diversified and inclusive development in rural economies. For other developing countries, the following aspects can be considered:

Enhance infrastructure development for inclusive Finance, especially in digital financial infrastructure which disproportionately benefits youth most, and expand the coverage of financial services for young rural entrepreneurs. Promote the outreach of financial institutions to rural areas, extending financial services from cities to rural regions, providing more convenient financial services for remote residents, including youth, and enhancing the breadth and depth of inclusive financial services.

Provide rural youth entrepreneurs with more convenient financing channels and applicable financial products. Leverage the role of policy-driven financial products, appropriately lower financing thresholds for rural youth entrepreneurs; enhance the enthusiasm and proactivity of serving rural micro-entities, providing financial services covering the entire lifecycle of small and micro entities, especially the early stages; and expand financial products and corresponding support measures adapted for rural youth entrepreneurial groups.

Strengthen capacity-building in technology, management, and financial literacy. A good rural financial system not only offers financial support but also provides entrepreneurs with capacity-building in technology, management, and financial knowledge through training, enhancing the success rate of entrepreneurship, which in turn boosts the effectiveness of financial services.

Formulate appropriate policies that are conducive to the development of rural youth. Prioritize public funds towards sectors with development potential and societal benefits, such as green digital agriculture, agricultural technological innovation, and agricultural social services, to encourage young people to integrate into sustainable rural economic development. Consider utilizing financial subsidies, tax incentives, technical support, legal aid, and talent training measures to complement financial means to provide the necessary support for the entrepreneurship and development of rural youth.

Chapter 5: The implications of China's entrepreneurship and innovation on youth development for South-South cooperation

As the main driving force for innovation, young people serve as a better conductor between traditional agriculture and emerging technologies. The inheritance, innovation in and sustainability of agriculture are calling for a new-generation leadership. Rural youth, however, have limited opportunities for international exchanges. Therefore, building platforms for agricultural cooperation and exchanges among young people, and strengthening their mutual learning and fostering pragmatic cooperation in agriculture are of practical significance for promoting balanced regional development and addressing global food insecurity and hunger.

5.1 China's youth entrepreneurship and innovation practices in agricultural S&T

With the progress in S&T, new agricultural technologies such as digital agricultural machinery and precision agriculture have gradually penetrated into all aspects of agricultural production. Commercializing and effectively utilizing these advanced technologies require a group of young people who are well versed in scientific theories and have hands-on experience. In cultivating young agricultural scientists and technologists, China has accumulated the following good practices:

Improving the innovation ability of young scientists and technicians. It's vital to enhance the young practitioners' ability to apply new technologies to agricultural production, offer them abundant academic interactions and practical opportunities, and enable them to continuously hone their innovation ability.

Prioritizing interdisciplinary collaboration and fostering multidisciplinary talents. The advancement in agricultural S&T often requires knowledge and technologies in multiple fields, such as agronomy, biological science, and information technology. Scholars from diverse disciplines should be encouraged to learn from and work with each other, to promote the innovation and development of agricultural science and technology.

Attaching importance to cultivating the hands-on ability of agricultural scientists and researchers. Emphasizing the significance of Industry-University-Research collaboration, and young scholars and researchers are sent to the farmland and rural areas to find out the needs and actual conditions of agricultural production, to better apply S&T achievements to agricultural production. Through the practical application of technology, entrepreneurship is inspired among young agricultural practitioners.

Case Study 13: Combining agrotechnology demonstration parks with talent cultivation to promote international cooperation in dryland farming

Dryland farming refers to agricultural production in semi-arid and semi-humid drought-prone areas where rainfall is the main source of agricultural water. In Central Asia, dryland farming still requires improvement: the land

utilization rate is low, the irrigated area is small, yields often depend on unpredictable weather conditions, and the output of most agricultural products is insufficient to meet the domestic demand.

Leveraging its strengths in crop breeding, modern animal husbandry, water conservation in agriculture, and food processing, Northwest A&F University launched the Silkroad Agricultural Education and Research Innovation Alliance in November 2016. The Alliance is committed to enabling students to conduct research on the platform of overseas agrotechnology demonstration parks promoting a group of high-level specialists with overseas fieldwork experience and interest in working in relevant countries, multinational corporations, and scientific research institutions.

Recommended by Saken Seifullin Kazakh Agrotechnical Research University, a member unit of the Alliance, Mr. Nurgulsim Kaster, a former faculty member of the University, joined Northwest A&F University in 2017 to study for a doctorate's degree in animal genetic breeding and reproduction in molecular biology. In 2022, he graduated with honors and returned to Saken Seifullin Kazakh Agrotechnical Research University to continue molecular biology research and teaching, hoping to apply what he had learned in China to improve Kazakhstan's competitiveness in animal husbandry.

"During my five years in China, I gained invaluable knowledge, which I am now imparting to you. I hope you will have the opportunity to visit China and study at Northwest A&F University," Kaster often said so to encourage his students in Kazakhstan. In May 2023, the two universities agreed to offer a collaborative dual-master's-degree program in food science and engineering for selected Kazakh students through joint education in the two countries.

The Silk Road International Agricultural Talents program of Northwest A&F University has recruited and trained 179 interdisciplinary students, and sent more than 70 students to universities such as North Kazakhstan State University for overseas studies and overseas bases of Chinese enterprises for internships that lasted three to six months. The training model combines domestic instructors, overseas instructors, and business mentors to work as a team. It has diversified practice and teaching bases, including overseas agricultural education units, demonstration parks, foreign-related institutions of the



Professor Alim Pulatov (first from left), expert of China-Uzbekistan Demonstration Park for Water-saving Agro-Technologies, introduces the operational status of equipment in the demonstration park.



Nurgulsim Kaster does an experiment while studying for his Ph.D. at Northwest A&F University.

Alliance, and domestic experimental and demonstration bases.

So far, Northwest A&F University has built eight overseas agrotechnology demonstration parks in Kazakhstan, Uzbekistan, Kyrgyzstan, Belarus, and Pakistan, where the planting of 115 crop varieties in 13 categories were demonstrated, and nine crop varieties in four categories suitable for local conditions were selected.

For example, in the Kokshetau Agrotechnology Demonstration Park in Kazakhstan, with the help of experts and young students from Northwest A&F University, a cumulative total of 250,000 mu of wheat was planted as a demonstration, in addition to another 4.5 million mu of wheat plantation as extended production, leading to an output of more than 400,000 tons of high-quality raw grain, equivalent to an eighth of China's average yearly wheat imports over the previous three years. The demonstration park has built a complete industrial chain covering planting, harvesting, management, processing, and trade, which comprehensively reduced the land load, facilitated the restructuring of the local planting industry, promoted economic development, and doubled farmers' income.

5.2 China's best practices for supporting emerging leaders in agriculture

China's concept of "rural entrepreneurial leaders" and its overseas equivalent "agricultural industry leaders" have something in common. Emerging leaders in agriculture can harness advanced technologies to transform traditional agricultural production models and the distribution strategies for agricultural products, to promote high-quality and sustainable agricultural development. China has witnessed the following best practices in supporting young leaders in the agricultural sector:

Conducting diverse training programs for aspiring farmers and agricultural entrepreneurs. The government, enterprises, colleges and universities have organized training programs on agrotechnology and on modern agricultural operations and management. Through these training programs, they can identify and promote the youth who have strong development willingness, a keen market sense and outstanding business ability, and moreover, continue to improve their technical know-how and business management capability. These young leaders can motivate smallholder farmers around them to connect with the market, energize agricultural and rural development.

Introducing and executing a range of incentives tailored for agriculture. Developing countries may consider adopting agrotechnology subsidies, preferential policies for land use, tax breaks for agribusinesses, etc. to shift conventional perceptions and motivate the youth to innovate and start business in rural areas. Policies should be streamlined for their entrepreneurial activities, to lighten their economic pressure, and tide them over in the startup period.

Offering financial backing for entrepreneurial and innovative endeavors in agriculture. It is important to popularize financial knowledge among the rural population and improve the financial infrastructure and provide more policy-based financial resources in rural areas. It's essential to encourage commercial banks and institutions to develop inclusive financial products in rural areas, and provide financial services for entrepreneurial activities of young farmers, especially for micro and small-sized agribusinesses during their initial development phase.

Case Study 14: Technical training drives African youth entrepreneurship: Chinese Juncao takes roots in Rwanda

Hailing from the Kigali-Gasabo district in Rwanda, Mr. Mushimiyimana Leonidas is the founder of Deyi Co. Ltd., a local mushroom company. He started to learn about Juncao technology in 2007. Then he completed Juncao training course in the China-Rwanda Agriculture Technology Demonstration Center and went to Fujian Province of China to further his study. This training gave him technical skills needed to start his own business.

In 2014, Leonidas founded a company in Rwanda to sell fresh mushrooms to hotels, restaurants, and other local consumer markets, trained women and youth in mushroom cultivation, and provided them with raw materials to produce mushroom substrate bags. His company now has more than 30 tons of mushrooms per year, with an annual net profit of US\$15,000.

His business achievements have lifted Mushimiyimana and his family out of poverty and empowered him to contribute to his community. He actively teaches

locals and has trained over 650 youths and 935 women on mushroom production in total. He also funded a community kindergarten where every child is fed fresh, nutritious, protein-rich mushroom meals.

“The mastery of Juncao's growing technology has helped me a lot. Without the technology or the support of Chinese experts, I would not have been able to live like this. I would like to be a bridge between this innovative technology and the people of Rwanda,” he said.



Leonidas proudly displays his mushrooms beside his new car.

5.3 China's global engagement on youth entrepreneurship and innovation practices

Over four decades, China has amassed valuable experience in agrotechnology, agribusiness management, and agricultural informatization, etc., which can help improve the self-development ability of the rural population in the Global South.

Many developing countries and regions are facing agricultural development problems similar to those that China once faced or still faces. Young people can become the pioneers in agrotechnology innovation and the leaders of rural poverty reduction. Therefore, they should be supported in different countries to learn from each other, carry out pragmatic cooperation, and promote South-South cooperation to enhance exchange, mutual learning and innovative development to ensure global food security, and contribute more to rural transformation, value chain development and food security.

Case 15: Empowering smallholder farmers: Building capacity towards a world with zero hunger

China's affordable and applicable agricultural technologies and rural development practices can be promoted in

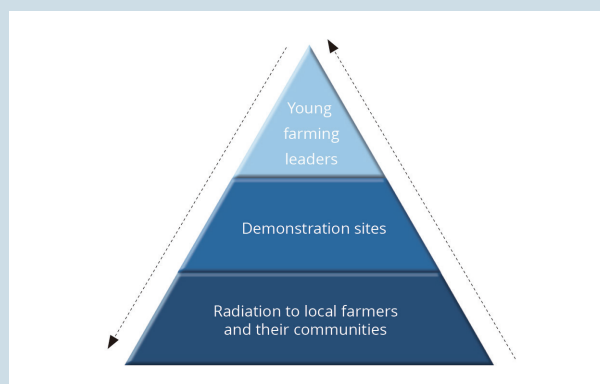
other developing countries, enhance the capacity-building of local young farmers, assist them to start their own businesses, and foster youth leaders in the local community. They then will support other farmers to increase production efficiency and gain more income, thus guiding more smallholder farmers in developing countries to get rid of poverty and hunger.

Drawing from the concept of “rural entrepreneurial leaders”, the WFP China Office launched the Demonstration in Africa/Asia/Latin America by Africans/Asians/Latin Americans (DAA) to facilitate the development of local smallholder farmers. The DAA aims to help smallholder farmers develop agricultural production, apply emerging information technologies, and learn agribusiness management concepts and models. This will subsequently help develop the agricultural value chains in products with quick economic returns and boost production and marketing. The project adopts the approach of learning by doing + field instructions. Based on the characteristics of local agricultural production conditions in partnering countries, around 2-5 representatives are selected from the demonstration sites (villages) in each project country, and 4-10 young farming leaders in each site/village will receive training.

The Demonstration in Africa by African project in the dry zone of Southeast Africa, is a youth entrepreneurship fostering program for young farming leaders proposed according to the actual needs. It plans to help local farmers use small-scale irrigation models, tentatively increasing the original one-crop harvest to possibly three crops a year and thus significantly boosting the output of potatoes, vegetables, and other related crops.

Training phase in China: Select groups of young farming leaders undergo 2-3 months of comprehensive training in selected Chinese institutions, including field training, agribusiness observation, and farm training. Young farmers will learn different technologies, skills, and China’s rural development practices, including crop cultivation, farmland management, post-harvest management, packaging and storage, cold chain, marketing, and e-commerce. The training, observation, and field training in China will enhance their ability to apply the learned agricultural technologies, good agribusiness practices, and business management knowledge. After returning to their country, they will also play a leading role in the specific project sites and surrounding communities. Beyond farming techniques, participants gain insights into business management and receive direction on industrial progression. Surpluses from increased crop output can be sold on the market to increase farmers’ income.

Overseas demonstration phase: Once back in their homeland, the trained young farmer leaders commence their demonstrations. The demonstration project will be carried out in alignment with the implementation of the new Food for Asset project. Chinese technical experts will be sent to continue providing technical training and practical guidance in the project area for a period of time. At this stage, specific technical support



Demonstration in Africa by African



and localized technology demonstration will be provided to the trained farmers and communities through on-site guidance, technology demonstration, and localized technical training. After the departure of Chinese experts, the trained smallholder farmers will take the leading technical role.

Large-scale promotion phase: During the implementation of the project, 250 smallholder farmers will receive direct training from young agricultural leaders trained in China. Through project training and technical guidance, these farmers will learn about new technologies and industrial development practices and apply them to their own production practices to increase crop yields. Step by step, more and more people will be trained. It is expected that in three years, 8,405 smallholder farmers will participate in the training and technical guidance of the project.

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Appendix: Policies on youth innovation and entrepreneurship for rural development (partial listing)

Release date	Policy name	Highlights
May 22, 2014	<i>Circular on Implementing the Plan to Guide College Students Toward Starting Their Own Businesses</i>	Measures are taken holistically around popularizing the education for starting a new business, opening up more training sessions, facilitating business registration and bank-account opening, offering multi-channel financing and business premises, and improving public services for entrepreneurship.
July 2015	<i>Circular on Implementing the Action Plan to Promote Entrepreneurship and Innovation Among Farmers (2015-2017)</i>	Active policy effort and local pilot and demonstration for entrepreneurship and innovation are encouraged for farmers; Platforms are built for entrepreneurship and innovation among the farmers; Models and experience of entrepreneurship and innovation among the farmers are summarized and promoted, and a number of classic cases established.
December 23, 2015	<i>Guideline on Organizing Entrepreneurship Training</i>	The service capacity in entrepreneurship is enhanced. The guidance, training and services for starting a business are connected for overall effectiveness. Improvements are made to public services and the systems for entrepreneurship involving guidance on business operations, new business incubation, project promotion, counseling, financing, and HR staffing agency.
April 13, 2017	<i>Medium-and Long-term Youth Development Plan (2016-2025)</i>	The policy system advancing youth employment and entrepreneurship is improved, with better services for youth employment.
July 3, 2019	<i>Circular on Promoting Employment and Entrepreneurship of College Graduates in the Current Situation</i>	Recruitments and services for entrepreneurship offered by public institutions and universities are subsidized in accordance with regulations. Overseas returnees, and young people from China's Hong Kong, Macao and Taiwan are covered by public employment service system and equally treated in their employment and entrepreneurship.
July 23, 2020	<i>Guideline on Increasing the Driving force of Entrepreneurship and Innovation Demonstration Bases for Further Progress in Reform and Employment</i>	Service systems for entrepreneurship are developed in which incubators, startup accelerators and industrial parks are mutually connected. Central budget prioritizes the construction of regional integrated service platforms for innovation and entrepreneurship.
August 2021	<i>Guideline on Campaigns to Encourage Youth Contributions to Rural Revitalization</i>	Young talents should be trained with a vigorous effort in rural areas. Relying on stationed organizations at all levels, smooth channels should be created for a growing number of young migrant workers to start businesses in their hometowns. Practical ways to address the problem of loan access or high lending interest for young people who start agriculture-related business.
October 12, 2021	<i>Guideline on Further Supporting Innovation and Entrepreneurship of College Students</i>	Colleges and universities deepen the reform of integrating innovation and entrepreneurship education into their talent training process as way to develop a new innovation-and -entrepreneurship oriented model.
November 5, 2021	<i>Benefits for Technical School Graduates in the 14th Five-Year Plan Period (2021-2025)</i>	More entrepreneurship and innovation trainers will be fostered and training sessions on entrepreneurship and innovation will be offered in technical colleges. It is advocated that localities support competent technical colleges in developing business incubators or other services for entrepreneurship.

November 26, 2021	<i>Guideline on Pursuing Greater Strength and Self-reliance in Science and Technology by Banking and Insurance Sectors</i>	The services for innovative tech talent should be enhanced. Banking and insurance agencies should actively expand services specially designed for the financial needs of research fellows, tech entrepreneurs, and key groups in innovation and entrepreneurship.
December 21, 2021	<i>Guideline of the Ministry of Culture and Tourism on High-quality Development of National-level Cultural Industry Zones</i>	National-level cultural industry zones and pioneer parks are advocated in the development and import of business incubators, mass entrepreneurship spaces, public technical services and platforms for the application of results to support youth innovation and entrepreneurship.
December 31, 2021	<i>Henan Province for Business Environment and Social Credit System Development in the 14th Five-Year Plan Period (2021-2025)</i>	The service capacity in entrepreneurship and innovation is upgraded. With an innovation-driven strategy, the reform of tech management systems is deepened to give institutes and universities greater say over their research, set up tech decision-making mechanisms in which administrative decision-making is underpinned by scientific and technical consulting, and innovate the mechanism for commercializing technological results.
January 11, 2022	<i>Circular on Creating A Better Environment for R&D of Science-and-technology-based SMEs</i>	Research fellows are motivated for innovation and entrepreneurship and young researchers enjoy policy support for innovation and entrepreneurship.
May 13, 2022	<i>Circular on Further Promoting Employment and Entrepreneurship of College Graduates and Other Young People</i>	Self-employment and flexible employment are incentivized with one-time allowances, guaranteed loans, interest subsidies, tax breaks and social security benefits in accordance with regulations.
June 12, 2022	<i>Several Measures on Further Supporting Innovation and Entrepreneurship of College Students</i>	Eighteen measures in nine areas are rolled out for building up college students' capacity to start businesses, optimizing the environment of innovation and entrepreneurship, improving services, and tax and fiscal policies as well as financial support, etc.
June 28, 2022	<i>Circular on Further Promoting Employment and Entrepreneurship of College Graduates and Other Young People in Zhejiang Province</i>	The reform of innovation and entrepreneurship education is deepened in colleges and universities, with improvements in the education system and training mechanisms, and an innovation and entrepreneurship education project and a startup support program are implemented in Zhejiang Province for college students.
July 2022	<i>Youth Contributions to Rural Revitalization in Shanxi Province</i>	With 14 initiatives (such as a rural youth e-commerce development program, a rural youth up-skilling action, and the Youth Empowerment Action) and six measures (such as the Project Hope for the New Era) which are in constant progress, youth federations, student' federations, social youth organizations and new youth economic organizations at all levels are being brought to serve rural revitalization and contribute to rural community building.
August 3, 2022	<i>Guideline on Further Supporting Innovation and Entrepreneurship of College Students</i>	New ways of serving innovation and entrepreneurship are developed and the capacity of service providers is constantly upgraded to make it efficient and convenient for college students to register their own businesses, with accelerated pace to launch one-stop services for innovation and entrepreneurship of college students.



July 17, 2023	<i>Circular on the Issuance of Ten Measures to Support Entrepreneurship of College Graduates and Other Young People</i>	Meticulous, targeted and well-designed services should be delivered to college graduates and other young people who start businesses in terms of diversifying financing channels, accelerating the commercialization of project results, and enhancing their ability in entrepreneurship. Favorable conditions are created for innovation and entrepreneurship of young talent by facilitating taxation, finance and policy terms.
July 17, 2023	<i>Several Measures on Building A Youth-development-oriented Province</i>	Guided by policy innovations, these measures include creating more jobs, offering employment-related guidance and services, helping people in need, and encouraging innovation and entrepreneurship to enable young people to contribute significantly to rural revitalization in Sichuan Province.

Note: Only partial policies since 2013 are listed due to page limitation.

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