



Sci-Tech Empowering Rural Transformation



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HER Power, HER Stories

Foreword

The process of industrialization and urbanization has resulted in an increasing trend toward the feminization of agriculture. Women play an important role in food security. According to statistics of the Food and Agriculture Organization of the United Nations (FAO) and the International Labor Organization (ILO), in 2016, the proportion of women in the labor force in developed countries such as the United States, Germany, France, Japan, and South Korea was 25%, 32%, 28%, 38% and 40% ^[1], and it was 40% in China ^[2]. According to the estimate of FAO, there are now about 36% of female workers in agricultural food systems globally ^[3], and the number is 43% in developing countries ^[4]. In agriculture, women's contribution is not only in terms of manual labor, but also in terms of their knowledge of agricultural practices and biodiversity. It has been proved that they play a unique role in particular areas such as the collection of biomass fuels, processing of foodstuffs, and marketing of agricultural products. More than 70% of water resources management and collection worldwide is carried out by women ^[5].

Despite women's significant contribution to agricultural production and societies, according to multiple global gender and development indicators, women only earn 82% of what men earn from the paid work similar to agriculture, and they have to adapt to technologies designed for men^[6]. According to the statistics of World Bank, closing the gender gap could increase yields on female-run farms by 20-30%, which would increase the total production of agriculture in developing countries by 2.5-4% ^[7]. In China, female-run farms face challenges similar to those in other developing regions, particularly in terms of land access and resource attainment. Women often lack access to the same agricultural inputs, technology, and markets as their male counterparts, further exacerbating this gap in productivity.

On May 2, 2024, the United Nations General Assembly adopted a resolution, proclaiming 2026 as the International Year of the Woman Farmer, calling for giving more attention on the barriers and challenges faced by women farmers in agrifood system, as well as to provide solutions, and to achieve gender equality and women's empowerment for agriculture. Practices have shown that the widespread application of modern agricultural technologies has greatly improved the

division of labor for women and reduced their burden in agricultural production. Additionally, the spread of digital technologies has made it much easier for women to access the knowledge and technologies needed for agricultural work. With new factors involved, women can either engage in agricultural production independently when men go out for work or take on the traditional role of men in the co-production process, which greatly reduces the irreplaceability of men in agricultural production. In addition, the accessibility of agricultural mechanization technologies has made young women to give a more positive assessment for gender relations in agricultural production ^[8,9]. That will undoubtedly contribute to the realization of gender equality and women's empowerment for agriculture, and will contribute to the reduction of hunger, the vitalization of the economy, the strengthening of resilience to shocks of climate change, and a quantum leap in the world's process of reaching the goals of eradicating poverty and creating a world without hunger.

This year's special report is jointly compiled by the FAO Representation in China, the International Fund for Agricultural Development (IFAD) China Office, the Centre for Sustainable Agricultural Mechanization of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP-CSAM), the United Nations Development Programme (UNDP) in China, and the China Internet Information Center (CIIC). Professor Robert Walker, Fellow of the British Academy of Social Sciences and Foreign Professor at the Jingshi Academy at Beijing Normal University, provided special support for this report.

The report is a South-South cooperation knowledge product jointly launched by UN agencies in China and Chinese partners. It showcases series of case studies of HER Power in driving rural transformation through science and technology, highlighting women's contributions and success stories. It does not aim to provide a comprehensive gender analysis or solutions to structural challenges but seeks to inspire action and collaboration by illustrating the potential of women's empowerment in rural development. Readers are invited to provide valuable suggestions for improvement.

Chapter 1: Policy Overview

Totaling over 680 million people, women account for 48.76% of China's total population,^[10] and those who reside in the country's rural areas and are capable of working make up more than half of its current rural labor force.^[11] Empowering women and supporting their involvement in agricultural and rural development are key components of China's rural vitalization strategy. Over the years, the Chinese government has vigorously promoted women's development through strong policy measures, which has helped position women as a key driver in advancing the nation's agricultural sector, "half the sky" in agricultural science and technology promotion, and a pillar of innovation and entrepreneurship in agriculture.

China supports women by developing and implementing policies designed to:

Improve women's livelihoods and enhance their self-development capabilities. Poverty eradication and improvement of women's economic conditions are important parts of sustainable development. During its fight against poverty, China emphasized integrating a gender perspective into poverty alleviation policies and launched initiatives such as Women's Poverty Alleviation Action, which consists of various endeavors related to employment support and training, industry-oriented poverty reduction, talent and entrepreneurial support, financial support, information sharing, and minimum income guarantees for impoverished women and has helped address the issue of absolute poverty among women. According to official data, in 2010, women experienced poverty 0.4% more often than men did, whereas there was no significant difference by 2019.^[12]

Eliminate gender discrimination in education and increase women's enrollment rates in schools. The Chinese government supports women's participation in higher education, especially with regard to courses and majors related to science, technology, engineering and mathematics (STEM), which has helped improve their ability to drive agricultural and rural transformation with technology. Vocational education and skills training, including internet and e-commerce training aimed at women, have been conducted extensively, which has helped women bridge the digital divide, capitalize on opportunities in the digital economy, and engage in high-quality development. Additionally, schools and branches of the All-China Women's Federation (ACWF) – an organization that serves as the official leader of China's women's movement, promotes government policies related to women, protects women's rights within the government, and helps liberate them from traditional roles with the aim of promoting their overall status and welfare in Chinese society – have conducted various forms of leadership education for women, which has helped them improve their management, decision-making, and entrepreneurial abilities and created a foundation that unlocks the important role that they can play in rural vitalization and community management.

Support rural women in innovation and entrepreneurship. The ACWF and various Chinese government departments and agencies have launched entrepreneurship support programs for women, leveraging the internet to innovate training models designed for women, establishing women's entrepreneurship demonstration bases, mobilizing social resources to foster entrepreneurial and innovation-oriented initiatives, and incubating entrepreneurial and innovation-oriented projects. By 2022, women had participated in entrepreneurship- and innovation-themed training sessions arranged

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by Women's Federations at all levels a total of 5.52 million times, more than 2,800 women's entrepreneurship and innovation competitions had been organized, over 3,800 new service platforms for female entrepreneurs had been established, women had received support in establishing more than 350,000 family farms and agricultural cooperatives, and over 100,000 e-commerce leaders had been trained throughout China, benefiting over 15 million women and helping them increase their incomes and forming the beginning of a service network involving "the internet + women's entrepreneurship."^[13]

Provide financial support for rural women. The Chinese government has implemented financial policies designed to help women gain employment and start businesses, promoting equal economic rights for women, increasing household incomes, and advancing rural economic development. China has been providing women with small guaranteed loans with interest subsidized by the government since 2009 in order to address the funding bottleneck that women face with regard to employment and entrepreneurship. In recent years, the ACWF has made unsecured loans and guaranteed loans featuring "varying principal, low interest rates, and flexible repayment schedules" specially designed for women available in collaboration with various financial institutions, which has helped rural women address some of the financing difficulties that they experience. The government supported financial institutions in issuing RMB67.8 billion's worth of micro-credit loans through an initiative focused on reducing women's poverty known as Women's Action for Poverty Alleviation, which helped make it possible for over 4 million impoverished women to increase their incomes and escape from poverty, and various loans totaling more than RMB171 billion were issued to tens of millions of women in both urban and rural areas through an initiative aimed at enhancing women's entrepreneurial and innovation capabilities known as Women's Entrepreneurship and Innovation Action.^[14]

Encourage female Technical Task Force (TTF) personnel to promote agricultural and rural development. An institutional innovation in China, the TTF system was launched in Nanping City, Fujian Province, in 1999 and is designed to provide assistance to farmers and take the complex relationship between the government and markets into account by making science and technology commissioners capable of providing new knowledge and boosting production skills via lectures and field demonstrations available, creating a precedent for the country's traditional agricultural technology extension system to provide effective technical services to the grassroots nationwide. Sci-tech personnel provide technology services for farmers, including demonstration, training and consulting, which has played a crucial role in vitalizing the rural economy, increasing farmers' incomes, and facilitating rural economic transformation. Women account for 45.8% of China's science and technology talent^[15]. The Chinese government encourages women who are part of this group to participate in the TTF system and provide services at the grassroots level, including agricultural production guidance and dissemination of knowledge and information in areas such as healthcare, environmental protection and nutrition. Nearly one million female sci-tech professionals have participated in rural technology service undertakings, such as the Women's Sci-tech Assistance Express Train to the Countryside, which is a program that involves dispatching female agricultural science and technology professionals to modern agricultural scitech demonstration bases, where they conduct high-quality farmer training, and arranging for science and technology assistance experts to employ a model involving "online teaching + field classrooms + base training + interactive communication" so as to make agricultural technology available to greater numbers of women, which has benefited over 18 million people^[16].

Support women's participation in agricultural industrialization. The Chinese government has formulated multiple policies and measures designed to help enhance the roles and contributions of women in agricultural production and industrialization processes in order to promote women's participation in agricultural industrialization. The Chinese government has repeatedly included issues related to women and rural industrialization in its annual No. 1 Central Document, which is an annual policy statement outlining national priorities that has featured tasks related to agriculture and rural areas high on its agenda since 2004. An initiative designed to comprehensively enhance women's roles in rural vitalization by helping them improve their skills, promoting employment and entrepreneurship, and strengthening the protection of their rights known as Women's Action for Rural Vitalization was proposed in the 2018 No. 1 Central Document. The 2021 No. 1 Central Document and the 2023 No. 1 Central Document also covered endeavors such as cultivation of female agricultural talent and protection of the rights of women living in rural areas.

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Chapter 2: Powering Women's Development and Promoting the Upgrade of the Agricultural Sector

Modern agriculture is experiencing a transformative shift, with technology serving as a key driver of this change. Technologies such as the Internet of Things (IoT), big data, and artificial intelligence (AI) are taking root in vast farmlands, gradually reshaping agricultural production. New technologies, such as smart agricultural machinery and precision agricultural technology, have facilitated drastic reductions in labor intensity and other significant changes in agricultural production, which has created new opportunities for women. This chapter outlines innovations and practices related to the relationship between women and new technologies as well as new models designed to transform agricultural production and management and uses smart agricultural machinery and precision agriculture as examples. Women play a vital role in agricultural transformation, demonstrating their indispensable contribution to sustainable global agricultural development.

2.1 Agricultural Mechanization: Sci-tech Empowering Women and Driving Industrial Transformation

Modern digital technologies, such as continuously variable transmission (CVT), automatic positioning, intelligent navigation, and IoT-powered remote control, have made it possible for women to attain the same degree of capability as men in agriculture. Research indicates that more women are involved in agricultural production in China than men are, accounting for approximately 65% of the total.^[17] Female farmers aged 20 to 49 are valuable human resources in the development of modern agriculture, and women in this age group now outnumber men in rural areas.^[18] Women have become a mainstay of agricultural production in the country.^[19]

Case 1: From Tractors to Drones: Wang Min Becomes Versatile Agricultural Machinery Operator

Wang Min was born in east China's Anhui Province in the 1990s and later began engaging in grain and oilseeds cultivation with her husband. The hilly terrain and relatively poor land conditions in Anhui, along with the limited policy support for agricultural mechanization in the province prompted the couple to begin leasing land near China's central east coast areas such as Jiangsu Province's Changzhou and Nanjing cities in recent years. They currently manage over 1,000 mu (67 ha) land in the Jiangpu area, which is part of northwest Nanjing's Pukou District, through a long-term leasing arrangement. In 2016, as their operation expanded, Wang, seeking to alleviate labor shortages during peak farming seasons and reduce her husband's workload, proactively obtained a tractor driving license to assist with land tilling and other work.

In 2020, she was introduced to crop protection drones by a young local agricultural mechanization entrepreneur, which gave her opportunity to learn how to operate them. She mastered various technical skills, obtained a drone operator's certificate, and developed a strong passion for drone piloting. This led her to become an independent agricultural machinery service provider, gaining recognition from the communities she works in. Some of the key

practices that she has engaged in are outlined below.

(1) Mechanizing Entire Grain and Oilseed Cultivation Process

Wang gradually introduced efficient agricultural machineries, such as compound seeders and crop protection drones, into her rice and wheat cultivation efforts, using them alongside tractors and combine harvesters. This

allow her to achieve full mechanization operation in the grain production she is involved with. She and her husband boldly began using combine harvesters for rapeseed – a crop that typically has a low rate of mechanized harvesting in Jiangsu –significantly reducing manual labor and increasing production efficiency. This development also helps promote the mechanization of oilseed production by setting a positive example for the neighboring smallholder farmers.

(2) Expanding Drone Applications

In the past, crop protection drones were typically used to spray liquid pesticide to control pests, weeds, and diseases, and their tank capacities came to around 30 liters in 2016. As technology has advanced, they are now capable of distributing both granules and liquid, with capacities increasing to 50 liters. Crop protection work can be completed on around 500 mu



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Wang Min, professional agricultural drone pilot

(33 ha) to 600 mu (40 ha) of land per day with a 50 liters drone, and up to 1,000 mu (67 ha) during peak farming season. Wang, gradually expanded the use of drones beyond crop protection to include fertilizer application and seeding. This significantly reduced labor intensity and improved efficiency in addition to effectively addressed the challenges of seeding and fertilizing rapeseed in hilly areas.

(3) Applying Intelligent Assisted Driving System

Intelligent assisted agricultural machinery driving systems have rapidly emerged and evolved with the development and maturation of digital technologies such as satellite remote sensing and precise positioning, and the widespread application of the BeiDou Navigation Satellite System, a satellite-based radio navigation system owned and operated by the China National Space Administration. Wang therefore equipped her tractor with an intelligent assisted driving system to ensure that her agricultural machinery follows straight, preset paths during operations such as trenching and seeding. This helps reduce operational errors, maximize land-use efficiency, improve crops' visual appeal, and enhance the external benefits of agriculture, including carbon sequestration and nitrogen fixation.

(4) Providing Plant Protection Services with Drones

Wang also provides specialized crop protection services for a Nanjing-based cooperative that oversees more than 10,000 mu (667 ha) of farmland, as well as for neighboring farmers, using her drones. This is in addition to the crop protection, weeding, and other tasks that she performs on her own nearly 1,000 mu (67 ha) of farmland. In 2023, she single-handedly provided crop protection, weeding, and other services across more than 100,000 mu (6,667 ha) of land in Jiangsu and Anhui provinces. As a versatile agricultural machinery operator, she received widespread praise from the farmers she works with and reshaped perceptions of women's role in agricultural mechanization through her meticulous work, well-managed operations, and excellent crop protection outcomes.

Case 2: From Planting to Harvesting: Woman Pursues Full Sugarcane Farming Mechanization in Guangxi

Wei Shuixiu, born in 1977, is a sugarcane grower from south China's Guangxi Zhuang Autonomous Region. Sugarcane is the most important sugar crop in China. Guangxi, a prime sugarcane-producing region, has long accounted for more than 60% of the nation's sugarcane cultivation area. The industry has faced development challenges in the region due to agricultural labor shortages and low production efficiency. However, both national and local governments place great importance in its industrialization and have been offering significant subsidies for seed and machinery.

In 2015, Wei decided to discontinue the wholesale fruit business she had been running and established a sugarcane farming cooperative. She adopted mechanized production and soon obtained operating licenses for a combine harvester and crop protection drones. Her cooperative currently covers more than 1,000 mu (67 ha) of land and is a model for farmers and practitioners in the surrounding area.



Wei Shuixiu poses with her sugarcane harvesting machine.

(1) Innovative Application of Mechanized Agronomic Farming Model

In 2015, nearly 60% of sugarcane production was fully mechanized at the land preparation stage, while cultivation and harvesting were only 39% and 6.5% mechanized respectively. This severely constrained the development of the sugarcane industry. Wei studied relevant knowledge and mastered applicable techniques and technologies. She improved soil cultivation and preparation at her farm, built machine-accessible roads and other infrastructure,

selected sugarcane varieties suitable for mechanized operations, adjusted furrow depth, root length and sowing density, and made other innovations, culminating in the adoption of a fully mechanized sugarcane cultivation model. Most importantly, Wei adjusted row spacing from the traditional 0.90 m to 1.20 m to accommodate large combine harvesters, thereby laying the foundation for the full mechanization of sugarcane cultivation, including tilling, planting, management, and harvesting.

(2) Promoting Full Sugarcane Mechanization and Sugarcane Cultivation Scaling

Wei decided to increase the level of mechanization in her sugarcane farming and began purchasing sugarcane planters, medium and large-sized tractors, and the early-stage sugarcane combine harvesters that were available at the time, as well as pest and disease control drones. This allowed her to replace the relatively inefficient crop protection equipment that she had been using. With support from some sugarcane machinery manufacturers and the local agricultural mechanization technology promotion department, she was able to develop a fully mechanized sugarcane cultivation process. In 2015, Wei conducted a trial run on 300 mu (20 ha) of land and gradually expanded the effort after it proved successful, ultimately reaching mechanized farming across more than 1,000 mu (67 ha) of land by 2018. This shift enabled her to cut costs and increase her income significantly by RMB7,500 to RMB9,000 per ha.

(3) Encouraging Surrounding Sugarcane Growers to Adopt Modern Production Methods

The economic conditions in Guangxi are relatively underdeveloped; its terrain is primarily hilly and mountainous, and the majority of its sugarcane farming is done by small and medium-sized farmer households. The significant progress that Wei has made with sugarcane mechanization has set a positive example for small-scale sugarcane farmers in surrounding areas, encouraged nearby farmers to move from traditional practices and pursue machine-compatible cultivation models. As an agronomist, she also provides mechanized farming services, which is another way she has effectively helped neighboring small-scale farmer households adopt and benefit from modern production methods. In 2023, Wei provided mechanized sugarcane farming, crop protection, and harvesting services across more than 1,600 mu (106 ha) of farmland.

Case 3: From Large-Scale Production to Precision Agriculture and Service Management: High-quality Cooperative Grain and Oilseed Operations

Wang Lijuan, born in the 1980s in Nanjing City, Jiangsu Province, China, operates a cooperative specializing in grain and oilseeds production in Pukou District in recent years. Starting with managing a family farm of approximately 200 mu (13 ha) of farmland, she obtained a tractor driving license in 2016 due to the shortage of machinery operators to assist with mechanized farming operations. Wang gradually expanded her enterprise until she was cultivating more than 10,000 mu (667 ha) of land and implemented a specialized, high-quality, large-scale cooperative operations model involving full mechanization, standardization, and industrialization. Some of the key practices she has engaged in are described below.

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(1) Transforming Full Mechanization to Precision Agriculture Practice

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The utilization of intelligent equipment, such as integrated water and fertilizer systems, agricultural drones, and crop monitoring systems, has been taking the rice, wheat, and rapeseed farming that Wang engages in from basic mechanization to precision agriculture. Intelligent water and fertilizer systems have been implemented in fields with suitable conditions, making it possible to automatically adjust water-fertilizer



Wang Lijuan, cooperative manager, inspects the growth of the crops.

ratios and spraying schedules, thereby greatly reducing labor costs and meeting crops' needs in real time. The development and application of crop monitoring devices and systems facilitate the remote observation of crop growth and the occurrence of lodging (the bending of crop stems due to buckling and/or root displacement), which can dramatically reduce yields and make harvesting more difficult. These systems enable timely actions. Additionally, the use of specialized agricultural drones allows for regular monitor for pests and diseases and supports precision fertilization and pesticide application to ensure optimal yields. The comprehensive scientific management implemented by Wang's cooperative results in high-quality rice that is highly valued by consumers.

(2) Expanding Grain Cultivation Industry Chain to Pre- and Post-production Stages

As Wang's cooperative continues to grow, it has expanded from production phase the pre- and post-production stages based on full mechanization. In 2024, the cooperative invested over RMB9 million in pre-production and established a fully intelligent seedling cultivation center, which dramatically reduced labor requirements, allowing only two people to manage the entire rice seedling cultivation process across the 40,000 mu (2,667 ha) of land that are currently being used for this purpose. In addition to labor savings, quality control has also improved, enabling the cooperative to produce high-quality seedlings for both itself and contracted farmers in the area. On the post-production side, the cooperative built a mechanized drying center and a primary grain processing center, which has enabled it to provide grain drying services for farmers in the surrounding area and establish a comprehensive grain production chain.

(3) Realizing Standardized Management and Branded Operations

Wang's operations and management approach includes strict implementation of various cost control and marketing strategies, along with careful oversight of the inflow and outflow of supplies and machinery. Service operations are monitored to ensure quality, and scale is verified. Standardized management has enabled tight control of production costs, clear assignment of production responsibilities, and the prevention of issues such as falsification and fraudulent behavior. The cooperative also registered the "Mingwen Rice" brand and integrated both online

and offline sales and marketing channels, which has helped increase revenue and gradually enhance the impact of the brand.

(4) Helping Cooperative Members and Nearby Smallholders Reduce Costs and Increase Incomes

As the leader of a large cooperative, Wang understands that her foremost responsibility is to help its members to achieve higher income. To this end, she adopted an innovative approach for sharing of agricultural machinery to improve its efficiency and ease financial burdens for members who do not own machinery. Her cooperative also streamlines operations by standardizing procurement and distribution of agricultural supplies and procuring agricultural products from members. Machinery services and supplies are offered to members below market prices, while their products are purchased at or above market rates. In addition to supporting its members, the cooperative also supports small-scale farmers in the area by providing seedling cultivation, supply, and mechanized services, helping them reduce costs and increase their incomes.

2.2 Precision Agriculture: Closing the Gender Gap and Driving Sustainable Development

This section covers ways precision agricultural technologies can help increase women's participation and narrow the gender gap in the agricultural sector, highlighting women's empowerment through case studies from China. The first subsection delineates ways to help women become more competitive in agricultural production. It discusses how precision agricultural technologies enable women to engage more effectively in agricultural activities by reducing labor intensity and improving efficiency and includes case studies from Bayer ForwardFarming - an initiative launched by the pharmaceutical and biotechnology company that "enables knowledge sharing about modern and sustainable agriculture through first-hand experiences on independent farms around the world" - and agricultural drone company XAG Technology covering experiences in China. The second subsection discusses efforts to increase women's participation and engagement in agricultural technology innovation and describes some of the achievements that the China Women's Development Foundation (CWFD) and Samsung China have made with regard to supporting women's involvement in agricultural technology research and development (R&D). The third subsection reveals the ability of a company that produces fresh-cut and preserved flowers known as Yunnan Holyflora Horticulture Industry Co. Ltd. to create agricultural jobs suited to women. The fourth subsection outlines ways that precision agriculture can improve female farmers' livelihoods in drought areas and includes a description of achievements that were attained regarding new varieties and new technologies as a result of a project that China's Nanjing Agricultural University (NAU) launched in Kenya. Finally, the section notes how further advancements in precision agriculture can unlock women's potential in both agricultural production and technological innovation in the context of China's current development. These endeavors have the ability to address gender inequality in food systems and promote female empowerment, which, in turn, contribute to more inclusive, equitable, and sustainable agricultural systems, promoting gender equality and driving sustainable agricultural development.

Technical barriers and demanding physical labor requirements are some of the obstacles that restrict women's involvement in agricultural and food systems. Precision agricultural technologies are able to diminish these problems

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and facilitate greater participation, however. Innovations such as automated machinery, drone-based remote sensing, and the IoT greatly reduce the physical demands associated with agricultural work, which enhances the ability of women to participate and boosts their productivity. Furthermore, technology popularization and training initiatives provide women with equal access to modern agricultural tools, narrowing gender gaps and empowering them with greater autonomy in both agricultural production and technological innovation.

2.2.1 Helping Women Become More Competitive in Agricultural Production

(1) Reducing Labor Intensity

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Precision agriculture significantly reduces work intensity for women farmers via automated equipment and advanced tools such as drones, sensors, and smart irrigation systems. These technologies are able to automatically monitor key aspects of agricultural production, such as soil moisture and crop health, reducing reliance on manual labor and enabling women to participate in a more effective manner.

(2) Enhancing Labor Efficiency

Precision agricultural technologies provide real-time data analysis tools, such as soil quality monitoring, weather forecasting, and crop growth data. These tools help women farmers plan planting schedules and fertilization strategies more scientifically, thereby increasing resource utilization efficiency and yields while reducing time and effort that may otherwise be wasted.

IoT technology. IoT technology entails extensive interconnection between objects, allowing devices to exchange information in real-time. Devices such as wireless sensor networks and RFID tags can be used to facilitate intelligent identification, tracking, monitoring, and management of agricultural inputs and equipment and thus facilitate automated operations, remote control, and intelligent management, which significantly boosts agricultural production labor efficiency.

Big data analytics technology. AI can accurately predict future agricultural trends and yields via the collection, organization, and analysis of agricultural big data – including meteorological, soil, and crop growth data. The data makes it possible to develop farming plans in a scientific manner, including by helping to determine optimal planting times, crop varieties, and cultivation locations, which thus improves crop quality and yields. The real-time monitoring that sensors and smart farming tools facilitate makes it possible for AI to calculate crop fertilization and irrigation requirements in a precise manner, which reduces resource wastage, ensures healthy crop growth, and maximizes agricultural productivity and resource efficiency.

(3) Making Precision Agriculture Accessible to More Farmers

Government bodies and relevant organizations have been actively promoting precision agricultural technologies in China in line with the overall widespread adoption that has been occurring and have placed particular emphasis on increasing women's participation in modern agriculture. Specialized training programs help female farmers master advanced agricultural technologies and data processing skills, which enhances their autonomy and competitiveness in the agricultural sector.

Reducing gender-based technical barriers. Women often face both physical and technical barriers in traditional agriculture, which makes it difficult for them to take on leadership roles in areas such as operation of heavy machinery and complex technologies. Precision agricultural technology promotion and training have enabled female farmers to acquire and use modern agricultural tools on equal footing with men, effectively reducing these barriers. This shift has improved their technical abilities and strengthened their decision-making power and influence in agricultural production.

Encouraging innovation and entrepreneurship. Precision agricultural technology training can enhance female farmers' work efficiency and stimulate their desire for innovation. An increasing number of women farmers have been exploring new agricultural models and even starting their own agricultural enterprises after receiving training. The accumulation of knowledge and practical experience gained from technology-oriented instruction helps female farmers respond more flexibly and independently to agricultural production challenges, creating more opportunities and possibilities for their career development.

Case 4: Bayer ForwardFarming Project Helps Implement Precision Agriculture

In 2015, an initiative known as the Bayer ForwardFarming project was launched in collaboration with farmers and other partners with the goal of uniting independent farms worldwide by introducing cutting-edge agricultural technologies and advanced management models in order to improve farming efficiency, ensure food quality and safety, and promote ecological harmony. In September 2020, this vision was realized at a greenhouse-oriented

fruit and vegetable farm located in Beijing's rural northern area known as Yinhuang Green Agricultural Ecological Park when it became the first farm to be involved with the project in the Asia-Pacific region.

Digital Management System

Yinhuang Green Agricultural Ecological Park is currently at the forefront of the agriculture industry in terms of digital and intelligent management. General manager Qin Aiteng uses an intelligent management system capable of monitoring greenhouse soil data in real time to engage in precision agricultural



A rendering of Yinhuang Green Agricultural Ecological Park, which is located in Baishan Village, Baishan Town, Changping District, in north Beijing

production. The data that it collects, processed through intelligent algorithms, can provide early warnings about the emergence of pests and diseases and make accurate crop yield predictions. The system is also able to adjust environmental parameters in the farm's greenhouses either semi-automatically or fully automatically based

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on real-time data and thus create optimal growing conditions for crops. The digital management platform that has been implemented utilizes big data analytics so as to provide more-scientific and -precise decision-making

support, which significantly enhances agricultural management efficiency and productivity, making it easier for the people who work at Yinhuang Green Agricultural Ecological Park, especially female employees, to manage it.

Eco-Friendly Agriculture

Sci-Tech

Various green control methods are utilized at the farm in order to reduce reliance on chemical pesticide while belts of flowering plants and insect hotels are maintained around its greenhouses, among other practices, in order to promote biodiversity, which also helps improve the quality and competitiveness of its products.

Precision Agriculture Practices

Advanced water-saving irrigation technologies that provide sufficient water while greatly reducing wastage of water resources, such as micro-sprinkler irrigation and an intelligent control system, are now being used at Yinhuang Green Agricultural Ecological Park. A tailored solution covering key steps including species selection and precision fertilization is designed for every crop that is grown in consideration of their growth stages based on data gathered from intelligent devices, which has improved the quality and efficiency of agricultural production.

Training and Empowering Women Employees

Useful contributions to women's empowerment are being made at the farm. Qin provides training and job opportunities that help women enhance their skills, increase their incomes, and improve their livelihoods; and 70% of the people who work there are women. Yinhuang Green Agricultural Ecological Park's investment costs have been reduced by 20% and its annual income has increased by 10% since it has become involved with the Bayer ForwardFarming project, which has benefited the surrounding 300-plus farmer households in the area. A pioneer in the Asia-Pacific region and a model for green control technologies in Beijing, the experiences associated with the site have been widely spread. A microcosm of the progression and growth that women have been making in agriculture, Qin's journey is contributing to "her story" in the sector.



Qin Aiteng at her farm

Case 5: Super Cotton Farm: Woman Helps Manage Large-scale Cotton Farm in Xinjiang Uygur Autonomous Region

Located in northwest China, Xinjiang Uygur Autonomous Region is the country's major cotton production base.

The physical demands of traditional agriculture can be particularly challenging for female farmers, however, and thus limit their participation in core agricultural management activities. Gender inequality is especially pronounced in traditional cotton farming, as women are constrained by both labor capacity and family roles.

In 2021, XAG Technology, a world-leading smart agriculture technology company dedicated to helping farmers grow more with less via robotics and AI technology based in southeast China's Guangzhou City, launched an undertaking known as the Super Cotton Farm – Future Digital Unmanned Farm Management Project in Xinjiang. After four years of technological upgrades, a replicable, unmanned, digital management model was developed for large farms. In October 2024, upland cotton yields reached 1,233.95 metric tons, or 529 kg per mu (7,935 kg per ha), on a farm it was implemented on.



Mo Xiaoyu observes cotton seeds with XAG technical support staff.



Mo Xiaoyu, a young woman who had no prior farming experience, got involved with the Super Cotton Farm project during the second year of its existence. She

A graphic comparing the Super Cotton Farm and neighboring farms

was able to easily get started by taking just a few simple steps. The experience felt like playing a real-life version of "Happy Farm" for her, which was a popular online farming simulation game that was discontinued in 2017.

The first step entailed digitization. This was done by using remote sensing drones to collect geographical data, followed by the installation of IoT devices such as agricultural recorders, weather stations, and soil sensors capable of providing precise data that can be used to inform agricultural decision-making. The second step was automating field inspections. Previously a labor-intensive task, XAG remote sensing drones are now able to provide information about the cotton that is being grown in real time. The third step was automating farming operations. Mo was able to achieve precision irrigation and engage in targeted weed control specifically where needed through the combination of a smart irrigation system and soil data analysis and also gained the ability to monitor her farmland remotely from a computer without having to be physically present.

"You don't need to have any previous farming experience to use the digital system," the young woman explained in 2024. "As long as you know how to use your mobile phone, you can manage over 500 mu (33 ha) of land."

The intelligent devices introduced by XAG Technology and the Super Cotton Farm model have brought profound changes to agricultural production and provided new ways to empower female farmers with technology.

2.2.2 Enhancing Women's Participation in Agricultural Technology Innovation

Historically, many technology-oriented fields have been dominated by men. Women are increasingly gaining pivotal roles in these areas as society progresses, however, breaking down gender barriers. Promoting women's participation in agricultural technology R&D enriches their skills and knowledge and helps drive innovation across the industry. Additionally, women's unique perspectives and experiences contribute diverse solutions, fostering a more sustainable approach to agriculture. Stakeholders should strengthen education, training, and policy support in order to bolster their involvement and create a more inclusive research environment. The following case study highlights China's successful efforts to empower women in agricultural technology R&D.

Case 6: Girls' Innovation in Agricultural Technology: New Intelligent Salmon Monitoring Label

Known for its health benefits, nutritional value, and excellent flavor, salmon has been experiencing increasing demand in China, though worsening marine pollution and the demands of reducing dependence on imports while preserving and ensuring nationwide distribution of salmon farmed in the country's inland regions, such as Xinjiang's Ili Kazakh Autonomous Prefecture, in northwest China, have presented urgent and complex challenges.

In 2023, six female high school students from Xinjiang and Beijing participated in a special collaborative project initiated by Samsung China and the China Women's Development Foundation (CWDF) – a national public

organization that was created with the goal of safeguarding women's rights and interests, improving women's quality of life, and promoting the development of women in the country – known as the CWDF-Samsung STEM Girls program. Under the mentorship of Tsinghua University experts, the students developed smart labels powered by the BeiDou Navigation Satellite System – a system owned and operated by China's National Space Administration that provides navigation, positioning,



A diagram outlining the intelligent monitoring label system that China Women's Development Foundation (CWDF)-Samsung STEM Girls program participants developed under the mentorship of Tsinghua University experts and its functionality

and time information and is used in many fields, including transportation, agriculture, and disaster relief, by users around the world – among other technologies in order to enhance the tracking of salmon and other goods involved with Xinjiang's cold chain logistics. Intelligent monitoring labels attached to packaging monitor real-time location, temperature, humidity, and vibration data and transmit it to a platform that can be accessed via a smartphone app so as to ensure full transparency and traceability throughout transport.

The intelligent monitoring label system consists of four main aspects: package monitoring, wireless communication, a cloudbased logistics platform, and data analytics throughout the transportation process.

The team has developed a first-generation cold-chain logistics intelligent monitoring labeling system and completed prototype equipment testing in vehicles in Fuhai County,



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Screenshots of the cold-chain logistics app that the CWDF-Samsung STEM Girls program participants are currently developing



Zhang Jianwei (left), associate professor at the Department of Precision Instrument at Tsinghua University, smiles with students after collecting field data.

Altay Prefecture, Xinjiang, thus far. After analysis and discussion, the girls and their mentors formulated a plan that includes long-distance testing, cloud platform optimization and prototype miniaturization. The team will also comprehensively promote the implementation and expansion of the project in the region. Their work highlights the valuable contributions of women in technology and serves as inspiration for other young women who may want to pursue careers in technology and logistics.

Designed for female middle and high school students, the CWDF-Samsung STEM Girls program offers science, technology, engineering, and mathematics education complete with real-world application experience with the goal of inspiring young women to address social challenges through interdisciplinary knowledge and innovation. Six rounds of the program have reached 1,000 high schools throughout China as of October 2024, attracting over 70,000 female applicants and benefiting nearly 20,000 students, more than 7,000 of which have been deeply involved in the program's educational and practical activities. Research topics cover 10 areas, including biology and physics, and, under expert guidance, the program has produced 20 research outcomes, five of which have been tested and applied on a small scale.

2.2.3 Fostering Women-friendly Job Opportunities

Technologies such as precision agriculture can revolutionize the production, processing, transportation, and sales of agricultural products, broadening market reach for high-value-added products. Some of these newly emerging jobs provide women with more competitive career opportunities, while others offer greater flexibility, allowing them to work according to their own schedules.

Case 7: Digitization and Technology Help Reshape the Flower Industry in Yunnan, Shandong, and Gansu Provinces

Known for its biodiversity and accounting for 70% of China's flower market, southwest China's Yunnan Province is Asia's largest flower production base and home to its largest flower trading center. The cut-flower industry in particular has the ability to promote poverty alleviation and rural vitalization, especially in impoverished areas, as it offers long-term growth and stability.

A woman named Fei Xuemei launched a company known as Yunnan Holyflora Horticulture Industry Co. Ltd. in the province, has taken a comprehensive approach that covers the entire value-chain, and has implemented

modern, digital farming and management technologies. Ninety percent of the more-than-300 people who work at her company are women, including over 70% of its leadership team. Around RMB60 million has also been invested in the establishment of a facility dedicated to the research and demonstration of techniques that can be used to cultivate high-quality roses that also serves as a breeding center, data resource hub, and hub for technical innovation in Yunnan's Yuxi City. Over 2,000 varieties of roses have been tested at the site and hundreds with strong commercial potential have been identified as of August 2024.

Holyflora holds more than 10 patents and has integrated advanced digital agriculture technologies spanning production management and marketing into its operations. For example, the company employs organic and eco-friendly farming practices in areas such as the Fuxian Lake, which is the third-largest lake in Yunnan and the deepest, region in Yuxi, where it uses farmyard manure and has invested RMB10



A screenshot of the backend interface for the digital flower management system that Yunnan Holyflora Horticulture Industry Co. Ltd. uses



A view of a Holyflora flower packaging line



Fei Xuemei (left) poses with female employees sorting flowers at a Holyflora facility.

million in a water and fertilizer recycling system, ensuring zero emissions during production. Holyflora also operates over 60 ha's worth of greenhouses equipped with fully automated control systems covering aspects such as lighting, temperature, water, carbon dioxide, and fertilization in Rizhao City and Zibo City's Zichuan District, in coastal Shandong Province. These types of innovations have helped address gaps that have existed in large-scale commercial rose production across the plains of northern China. Leveraging cutting-edge agricultural

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technologies, Holyflora has achieved a remarkable output value of over RMB150,000 per mu (RMB2.25 million per ha).

In 2017, Fei introduced modern flower farming in Weiyuan County, Dingxi City, Gansu Province, in northcentral China. Labor-intensive but not physically demanding, flower farming is a suitable undertaking for many of the women who live in its communities, and a project that encourages local women to cultivate roses and baby's breath (gypsophila paniculata), the herbaceous perennial, known as Flower Fields on the Loess Plateau was launched in order to help women get involved. Holyflora provides participants with seedlings and technical training and manages the sales process on their behalf and offers two options for the winter, when flowers cannot be grown locally: women who are able to travel can work at Holyflora's farms in Yunnan and Shandong, and those who need to remain in Gansu can participate in flower processing in the area, where they preserve fresh roses using specialized techniques.

As of August 2024, 270 women have been trained through Flower Fields on the Loess Plateau in Gansu; some earn an average of more than RMB30,000 per year working for Holyflora; 10 have become expert flower growers and established family farms with the support of the company; and a sustainable, replicable, asset-light flower industry-powered poverty alleviation model has taken shape.

2.2.4 Improving Women's Livelihoods

Precision agriculture can also facilitate the development of crop varieties that are more resistant to drought and disease via data-driven analysis and genetic modification. This approach reduces reliance on pesticides and fertilizers, cutting production costs while increasing yields. These advancements are particularly valuable for female farmers, who often manage small-scale farms and rely on their land to support their families. Adopting precision agriculture makes it possible for them to make more efficient use of their land and achieve more reliable harvests.

Case 8: Innovative Crop Varieties and Techniques: China-Kenya Cooperation Boosts Villagers' Incomes and Reduces Poverty

Located on the East African Plateau in Kenya, Nakuru County's Matangi Tisa Village relies primarily on smallscale farming but is frequently threatened by drought. On October 18, 2022, it became the first China-Africa agricultural development and poverty reduction demonstration village in Kenya and one of the first demonstration villages supported by a Chinese university in Africa, with China's NAU, the Nakuru County government, Kenya's Egerton University (EU), various international organizations, and other institutions joining hands to help it reduce poverty, and a project team comprised of NAU and EU experts was formed with support from the China-IFAD South-South and Triangular Cooperation Facility in order to engage in the following endeavors:

Introduction of a heartier crop. After conducting extensive research, the team identified drought as a major challenge affecting agricultural production in Matangi Tisa and determined that introducing a drought-resistant crop variety would be an effective way to address the problem. The team ultimately selected a new variety of bean developed by the China-Kenya Belt and Road Joint Laboratory on Crop Molecular Biology, which was launched

in 2016 by NAU and EU, known as the Chelalang and engaged in trials in the village. The variety is highly nutritious and high-yielding, producing 2.5 metric tons of beans per ha - 1.6 times the local average - on top of its ability to tolerate droughts.

Promotion of new tomato cultivation techniques. Tomato bacterial wilt is widespread in Matangi Tisa, and with limited pesticide production capacity in Kenya, many farmers are often forced to abandon tomato farming due to the high cost of purchasing the substance. In response, experts introduced grafting techniques to local farmers, which is an approach that effectively controls tomato diseases while reducing pesticide dependence. The innovation has reduced the incidence of tomato bacterial wilt from 90% to 10% while boosting yields to 5,000 kg to 6,000 kg per mu (75,000 kg to 90,000 kg per ha). Every mu of land that tomatoes are grown on is now generating an additional 80,000 to 100,000 Kenyan shillings (approximately RMB4,424 to RMB5,530), or an additional RMB66,360 to RMB82,950 per ha, benefiting around 200



A flowchart outlining the development process that was designed for Matangi Tisa, which was chosen as first China-Africa agricultural development and poverty reduction demonstration village in Kenya, and challenges associated with it



Participants practice grafting at a training session covering the technique in Kenya's Nakuru County in August 2024.

households and making a substantial impact on poverty alleviation in the community.

Placing special emphasis on localization and women's capacity building. Experts dispatched by NAU have trained 156 Matangi Tisa residents and agricultural officers and Kenyan experts have conducted over 40 training sessions as of August 2024. Women have made up more than half of the participants in courses covering bean cultivation, greenhouse management, and tomato growing and grafting; the grafting techniques and related tools introduced by project experts have significantly reduced labor intensity for women farmers; and the project team has sought out households that would like to demonstrate and promote the adoption of these techniques, and female participants have played a significant role.

Hannah Wanjiku Gathirimu, a retired primary school teacher from Matangi Tisa, has emerged as a key leader who is recognized for her strong agricultural skills, ability to demonstrate how to use them and set an example, and her organizational abilities.

Her farm used to suffer from crop failure due to drought, and she also had to stop growing tomatoes in greenhouses due to a high incidence of disease. Chinese experts taught her many techniques designed to address the situation once the China-Kenya cooperation project was launched in the village, however. The



A demonstration farmer from Matangi Tisa named Hannah Wanjiku Gathirimu showcases drought-resistant Chelalang bean seeds.

Chelalang beans she cultivates reap bumper harvests even under drought conditions, and her greenhouse was refurbished, which has enabled her to resume her tomato cultivation. The new techniques and crop variety that she is using have increased her family's annual income by approximately 300,000 Kenyan shillings (approximately RMB16,600).

"A bountiful harvest is the greatest joy for farmers," Hannah stated in August 2024. "China's advanced techniques have helped us, and I will pass on the knowledge shared by Chinese experts to other farmers in the area so that everyone can prosper together."

2.3 Challenges

Significant challenges remain despite the immense potential of mechanization and precision agriculture to drive sustainable agricultural development and increase women's participation.

(1) Public Skepticism

Traditionally, agricultural tools and machinery have been seen as requiring significant physical strength and technical

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expertise, which can lead to the belief that precision agriculture is beyond the capabilities of women. As a result, women often face skepticism with regard to their ability to operate these machines and the quality of their work. Women often must demonstrate exceptional effort and perseverance, proving their abilities through extensive practice in order to gain acceptance and public recognition.

(2) Family Pressures

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In the past, women were primarily responsible for managing household affairs in traditional societies in China and other economically underdeveloped regions.^[20] With the evolution of the socioeconomic landscape and the migration of male labor, the participation of an increasing number of women is now needed in agricultural production. As women transition from primarily being housewives to becoming active agricultural producers and managers, they inevitably have less time available to devote to caring for children and elderly family members. Consequently, it is essential for family members to offer greater support and understanding.

(3) Large Investment Requirements

The high initial cost of technology remains a significant barrier in regions with limited resources. Moreover, many farmers – particularly women who have had fewer educational opportunities – may lack the computer skills and technical expertise needed to fully leverage precision agriculture. However, with the continued expansion of policy support, targeted training programs, and advancements in technology, precision agriculture holds promise for creating meaningful opportunities to enhance women's participation and productivity in the agricultural sector.

2.4 Lessons Learned

This chapter demonstrates the tremendous strength and potential of women in promoting the transformation of agricultural production and rural development by highlighting the application of emerging scientific and technological advancements as well as management models in agricultural production, especially the development of precision agriculture and the improvement of smart agricultural machinery. It aims to provide valuable experiences and insights for other developing countries.

Firstly, encourage women to utilize emerging scientific and technological tools to get involved in agricultural production. Governments and society in general should reevaluate women's roles in advancing agricultural mechanization, recognizing the crucial contributions that they play in addressing labor shortages and promoting the sustainable and intelligent development that agricultural machinery makes possible. Efforts should be made to ensure equal pay for women and men, eliminate social discrimination, and provide greater support and encouragement for women who may want to participate in agricultural mechanization.

Secondly, strengthen agricultural mechanization vocational training specifically for women. Barriers that may prevent women from participating in government-provided training programs, such as courses on machinery operation and agricultural management, should be removed. Databases of female agricultural machinery operators should be created, and specialized mechanization courses tailored to women should be offered, complete with modules on safe operation practices. Efforts should be made to ensure that all women who are interested in agricultural mechanization have access to skill training and that those who already have qualifications can receive further training so that they can be empowered to address climate challenges and contribute to food security.

Thirdly, accelerate the development of digital infrastructure. Internet connectivity should be strengthened in rural areas, and the digital and intelligent transformation of essential infrastructure, such as water management, road networks, and electrical grids, should be supported. Improvements should be made in accordance with local needs and conditions in order to lay solid foundations for the advancement of digital agriculture. Expansion of digital infrastructure promotes the adoption and application of precision agriculture technologies.

Fourthly, improve scientific and technological literacy and skill levels among rural women, where substantial room for growth remains. This can be achieved by providing digital literacy and agricultural machinery operation training, which empowers rural women to utilize digital technologies and mechanized tools more effectively, thus promoting efficient field management.

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Chapter 3: China's Technical Taskforce System: Women in Science and Technology Help Facilitate Rural Development

3.1 Overview of the Technical Taskforce System

The power of science and technology has played a significant role in the remarkable economic growth that China has experienced over the past few decades, including in the realms of poverty alleviation and rural development. The application of technology in agricultural production and rural livelihoods has sometimes experienced bottlenecks, however. The Chinese government introduced the TTF system in the 1990s with the goal of facilitating the dissemination and application of scientific knowledge and technical innovations in rural areas. Born out of grassroots exploration, public demand, and practical innovation, the TTF system mobilizes a diverse pool of science and technology talent and organizations that combine and make use of modern resources, such as technology, information, capital and management. Deploying TTF commissioners to grassroots communities in rural areas fosters innovation and entrepreneurship and cultivates farmer groups that share risks and benefits, which have, in turn, propelled rural development to new heights.^[21] Facilitated by governments at various levels, the deployment of the TTF system serves as a crucial bridge between scientific research and its practical application in rural settings. The commissioners have offered a novel approach to agricultural production services for local governments by addressing mismatches between the supply and demand of scientific and technological information, market demand and production supply, and R&D and production requirements that may exist.

In 1999, Nanping City, Fujian Province, initiated China's TTF system. In 2002, Xi Jinping, then governor of Fujian, conducted a comprehensive review of the efforts that Nanping had been making to deploy TTF commissioners to rural areas. He commended the TTF system as a valuable market-oriented rural development innovation and strategy and deemed it worthy of thorough examination.^[22] From 2006 to 2009, China's Ministry of Science and Technology piloted the system in a total of 30 counties in 15 provincial-level administrative areas in collaboration with the United Nations Development Programme (UNDP), which resulted in the TTF pool expanding considerably to 9,096 commissioners. By 2014, the program had expanded to cover 31 of China's provincial-level administrative areas, and more than 75,000 TTF commissioners had been dispatched. One million farmers have benefited from the program every year since 2008, which has helped make it possible for them to increase incomes by an average of 10% per year.

A total of 289,800 TTF commissioners were dispatched and over RMB20 billion of funding was made available from November 2012 to 2023, which made it possible to launch 37,600 high-tech programs, introduce more than 50,000 advanced applied technologies and new, improved products, and establish 1,290 innovative and entrepreneurship platforms, contributing to significant poverty alleviation progress.^[23] China has introduced policies (see Appendix: Policy List) designed to support and encourage women's development in science and technology, providing substantial backing for their contribution to rural development. Provinces such as Fujian and Shandong have also introduced gender-friendly policies specifically tailored to female TTF commissioners, ensuring institutional support for the role of women in scientific and technological innovation within rural development.

3.2 Women in Technology: Driving Rural Development

In recent years, as Chinese women have achieved higher social statuses and levels of education, the number and proportion of female scientists and technologists have steadily increased. Between late 2009 and 2017, the number of female science and technology professionals in the country rose from 21.6 million to 35.606 million – 38.9% of its total science and technology workforce.^[24] Female TTF commissioners have played a pivotal role in promoting agricultural technology, boosting women's employment, and improving livelihoods in rural areas. Their unique experiences and gender perspectives have proven invaluable in the application of technological innovation to agriculture and rural communities. The deep understanding that the commissioners have shown with regard to the needs of rural women and the tailored technical support that they have provided have also led to strong bonds being formed.

Female TTF commissioners have helped rural women acquire skills, enhance their job prospects, and participate in women's entrepreneurship ventures through women's empowerment initiatives. The women's cooperatives that they have helped establish and the financial and technical assistance that they have provided have helped foster collective development among women and power the rural economy. National policies, such as increased funding for training and promotion of successful female role models, have further supported and encouraged female TTF commissioners in their efforts to transform rural areas.

3.2.1 A Gender Perspective on Technological Experience and Innovation

Although women make up nearly half of China's total population, their involvement in technological innovation and technologically powered innovation remains notably limited and falls well short of this ratio. This gender gap risks excluding women, an already marginalized group, from benefiting from technological advancements, particularly in rural areas, in addition to restricting the comprehensive nature of technological and technologically powered innovation. The establishment of the TTF system has provided women with institutional guarantees, financial support, and social networking resources that help them enhance their technical capabilities. The female TTF commissioners that have been dispatched have challenged gender stereotypes, championed gender-friendly technologically powered innovation throughout China, which they have brought fresh perspectives and new momentum to, and spearheaded the pursuit and development of various industries in the country's rural areas. Their work has elevated the status and influence of women in science and technology, contributing significantly to rural vitalization, on top of helping to facilitate sustainable rural economic development.

Case 9: Gender-inclusive Technological Innovation in Rural Vitalization

Many technological innovations that are applied in rural areas have inadvertently excluded women due to a lack of gender-sensitive considerations. The emphasis and support given to female participants and beneficiaries in China's technical taskforce (TTF) system has fostered a more inclusive approach to technological innovation in its rural areas, however.

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In recent years, Fujian's rapidly growing forest understory economy has emerged as a relatively promising opportunity for women living in rural parts of the province, particularly those seeking flexible work arrangements that allow them to balance their family responsibilities. Successful cultivation of forest understory crops requires specialized knowledge in areas such as variety selection, pest control, and market risk management, however, which has hindered widespread engagement in this area.

Su Hailan, a senior agronomist at the Fujian Academy of Agricultural Sciences, which develops advanced scientific technology in areas such as crop breeding, animal husbandry, livestock and poultry feed, biological pesticide, plant protection, rice transgenic technology, ecological agriculture, prevention and control of animal disease, and facility agriculture and is the only provincial multi-disciplinary integrative agricultural research organization in Fujian, was appointed a TTF science and technology commissioner in 2014 and began providing technical assistance to farmers in Nanping's Guangze County. Many farmers living in mountainous regions like Fujian have struggled to profitably cultivate crops used in traditional Chinese medicine due to limited technical expertise and utilization of unsuitable varieties.

Su and her team engaged in extensive research and field work and overcame challenges associated with the artificial cultivation of herbs used in traditional Chinese medicine. They developed effective techniques, such as early planting, organic fertilization, and integrated pest management, which helped make it possible for farmers to establish 650 mu's (more than 43.3 ha) worth of giant Chinese solomon's seal (polygonatum cyrtonema) demonstration bases. The innovative practices that have been implemented have resulted in a 16% reduction in pesticide use, a 20% decrease in pest and disease outbreaks, and a 25% increase in yields.

Leveraging the TTF system, Su effectively mobilized the Fujian Academy of Agricultural Sciences' multidisciplinary research capabilities. Integrating agriculture and forestry, she has strengthened foundational research in the forest understory economy, fostered cross-disciplinary collaborations among various professionals and institutions, and deepened partnerships between businesses, academia, and other research organizations. Government-led initiatives have helped bridge the gap between research and industry and have provided essential policy support and guarantees for local development of the Chinese medicinal herb cultivation industry.

A driving force in Women in Science and Technology Innovation – a national initiative designed to help Chinese women become more empowered and self-reliant with regard to the application of scientific and technological developments and the country achieve a strategic transformation into a major science and technology power by boosting progress in these domains in rural areas – Su has been helping a substantial number of rural women become local science and technology experts.

"Harnessing modernization and advanced technology can enhance the productivity of our cherished land," she noted in 2024. "Our aim is to leverage scientific research to boost harvests in the fields."

Su has been instrumental in promoting forest understory economy technology and serving the needs of forestry farmers at the grassroots level. She has conducted research on the selection and breeding of new varieties of giant

Chinese solomon's seal and varnished conk (ganoderma lucidum) as well as ecological cultivation techniques in forest understories. Su has provided on-site technical guidance and training covering topics such as hightemperature cultivation and drought prevention to emerging farmer leaders in many rural areas in Fujian and encourages them to share what they have learned with other farmers living in their local areas.

Su's special science and technology envoy team enabled a woman from Nanjing County, Zhangzhou City, Fujian Province, named Fu Meitao to undergo a remarkable transformation, for example. She went from cultivating the morinda root (Morinda officinalis), which is also known as Ba Ji Tian, can be consumed as food, and may be able to treat various health conditions, in an unplanned manner to successfully establishing a family forest farm and becoming an active participant in agricultural research trials.

"The assistance and guidance that the team has provided resulted in me obtaining trademark registration, product development, and project management skills," Fu noted in 2024. "My products have even won awards. I'm committed to helping other women cultivate forest understory medicinal plants and develop the undertaking."

Su Hailan (left), senior agronomist at the Fujian Academy of Agricultural Sciences, instructs a local female farmer leader in Fujian Province.



Su instructs students in a special program in Fujian. She provides in-depth science education in primary and secondary schools in the province.

Many female TTF commissioners, such as Su, are bringing a fresh perspective to scientific research.

Leveraging their unique experiences as women in science, they are developing gender-sensitive solutions that address challenges faced by women in their work and other aspects of their daily lives.

3.2.2 Women Spearhead Green Transformation in Rural Areas Using Science and Technology

Female TTF commissioners have played an instrumental role in driving green transformation in rural areas. Empowering women scientists and providing them with a platform to engage in rural development, the TTF system has helped participants gain greater professional recognition and fostered the establishment of women-led professional networks. These networks enable women to participate in the decision-making process and drive positive change in their communities.

Case 10: 'Carbon Sinks + Female Technical Task Force Commissioners Alliance' Initiative Boosts Green Transformation^[25]

Fully leveraging the role of women in special science and technology missions, the Women's Federation of Fujian Province – a branch of the ACWF, which is responsible for promoting government policies pertaining to women and promoting the overall status and welfare of women in Chinese society – launched an innovative initiative that formally organizes female scientists to work together on carbon sequestration projects known as the Carbon Sinks + Female Technical Task Force (TTF) Commissioners Alliance on September 26, 2021, pioneering the program for eventual use throughout the country. China's TTF system has fostered a more inclusive approach to technological innovation in its rural areas. With over 800 female scientists paired with 1,418 carbon sequestration agricultural and forestry bases as of October 2024, the Carbon Sinks + Female TTF Commissioners Alliance project is driving significant green transformation in Fujian.^[26]

Professor Liao Hong, a leading figure in sustainable agriculture and a key member of the alliance, played a pivotal role in its establishment. A standing committee member of the ACWF, a science and technology TTF

commissioner, and the director of the Root Biology Research Center at Fujian Agriculture and Forestry University (FAFU)— a leading higher education institution in Fujian, jointly supported by China's Ministry of Agriculture and Rural Affairs, the National Forestry and Grassland Administration, and the Fujian Provincial Government – Liao has been at the forefront of agricultural research. She has dedicated herself to the research and development of green, ecological tea plantations since she became a member of the FAFU faculty in 2015.

Tea produced in Fujian Province is often grown on acidic soil with poor buffering capacity and a tendency to become compacted, while excessive fertilization can lead to nutrient leaching and water pollution. Liao addressed the issue by implementing an intercropping model involving soybeans and rapeseed. Soybeans, with their nitrogen-fixing abilities, improve soil fertility and reduce the need for synthetic fertilizers, while rapeseed, with its deep root system and pungent flavor, enhances soil health, repels pests and suppresses weeds. These benefits thus reduce environmental pollution in addition to improving the overall quality of the tea that is produced.



Professor Liao Hong (middle), director of Fujian Agriculture and Forestry University's Root Biology Research Center, provides technical guidance.



A diagram depicting a tea-soybean-rapeseed intercropping model and its benefits

The implementation of intercropping has significantly improved the ecological environment and natural landscape where tea is grown in Fujian. In 2022 alone, Liao and her Carbon Sinks + Female TTF Commissioners Alliance team reduced carbon emissions by 30% and phosphorus use by 90% at an organic tea plantation located in the ravines of Fujian's lush Wuyi Mountains National Park – a UNESCO World Heritage Site that encompasses

culture, scenery, biodiversity conservation, one of the largest intact forest in China, which is also one of the world's most significant subtropical forests, and a number of ancient, relict species, many of which are endemic to China – that used to suffer from poor soil health and a declining yields known as the Yanzike Ecological Tea Garden. Further efforts are being made to transform the site from owing carbon debt to being carbon negative, demonstrating the significant contributions of women in promoting sustainable agriculture.



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Intercropping soybeans significantly improves the ecological environment and natural landscape where tea is grown.

The Carbon Sinks + Female TTF Commissioners Alliance has sparked widespread action in the administrative area at the local level5. Women's Federation chapters across Fujian have promoted the local implementation of the initiative in collaboration with relevant departments and organizations. For example, in Ningde, a prefecture-level city featuring a warm, moist climate and fertile land located on Fujian's northeastern coast, the local Women's Federation reached out to women's industry bases in order to identify their technical needs and connected them with members of the local Carbon Sinks + Female TTF Commissioners Alliance, who then provide customized services designed to meet the ongoing needs of the bases. Additionally, 13 Ningde Women in Sci-tech Entrepreneurship Cooperatives were named and each received an influx of RMB5,000 of funding. A special financing program with a total credit line of RMB1.5 billion known as Ningde Women's Enrichment Loans was launched in collaboration with established financial institutions in order to prioritize financial services for enterprises and industry bases that serve women involved with science and technology. Nanping's Women's Steience and technology service teams at the city and county levels in order to provide support for the Carbon Sinks + Female TTF Commissioners' in order to recognize them and the work they have done.

3.2.3 Sci-tech Innovation Contributes to Both Economic and Ecological Development

A powerful engine that helps promote rural vitalization, technological innovation can help improve the ecological environment in rural areas on top of the new vitality that it can help facilitate in rural economies as various industries are upgraded and economic diversification is promoted, and Female TTF commissioners play an indispensable role in this process. Leveraging their expertise in agriculture, ecology, and rural governance, they have contributed significantly to improving rural livelihoods and protecting the environment. These women scientists have demonstrated that gender equality and women's empowerment are essential aspects of achieving sustainable development in rural areas.

Case 11: Female Technical Task Force Commissioner Fosters Integrated Ecological Agro-tourism Development

Xin Yeyun, a researcher at the China National Hybrid Rice Research and Development Center, has made significant contributions to the development of Wufu Town, Wuyishan City, Fujian Province, in southern China. Before she got involved, the rice cultivated in the area lacked added value, and the land it is grown on was frequently abandoned.

In 2019, Xin became a technical task force (TTF) commissioner and was sent to assist an enterprise that was launched in 2018, is engaged in areas such as agriculture and rural tourism, and owns and operates an experimental rice cultivation base located in Wufu known as Wuyishan Daoxiang Ecological Agriculture Science and Technology Development Co. Ltd. Under Xin's guidance, rice production in Wufu has evolved into a multifunctional industry, transitioning from a singular focus on grain production to a diversified combination of grain production, scientific experimentation, education, and leisure functions.

Xin introduced essential resources, such as seed, technology, and talent, and launched a campaign involving rice education, promotion of improved farming techniques, and brand building at the Wufu experimental rice cultivation base in order to industrialize and develop the region's rice industry. The researcher also helped assemble a support team of renowned rice experts, including multiple academicians, that has played a crucial

bridging role in the expansion of scientific research resources that are available to the base and the stabilization of its demonstration zone. The base has been recognized as a science education center, become a training ground for TTF commissioners, and has even hosted high-level conferences that showcase the latest developments in the industry as a result of Xin's efforts.

Leveraging local rapeseed and lotus flower farming, Wufu established a rotation system involving lotus and rapeseed at the site, with diverse rice varieties being incorporated, and launched an initiative to create rice paddy art onsite. These endeavors have resulted in a stunning agricultural landscape taking shape and a valuable science education platform emerging in addition to significantly increasing the added value that the



National Hybrid Rice Engineering Research Center research and technical task force (TTF) commissioner Xin Yeyun inspects rice fields.

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base produces. Over 300,000 visitors have engaged in sightseeing, educational, and leisure activities at the site from 2020 to October 2024, and the high-quality rice varieties that are grown there command up to RMB16 per kg.

The integrated ecological agro-tourism model that has been employed at the base has had a significant spillover effect in the area as well, driving the development of industries such as dining, hospitality, tourism, and retail, and women have made



A view of some of the rice paddy art at the experimental rice cultivation base in Wufu Town, Wuyishan City, Fujian Province

up the majority of those who have gotten involved with them.

"In the past, we only had tourists a few months a year," a female owner of a local restaurant named Lin Guifeng remarked. "Now, thanks to the attraction of rapeseed, lotus flowers, and rice paddy art, tourists come year-round, and our customer traffic has increased significantly."

3.3 Lessons Learned and Implications: Gender Mainstreaming in Technological Innovation

3.3.1 Challenges Faced

(1) Pressure as a result of playing multiple roles

Despite gains that have been made in confidence and well-being, female science and technology professionals still face challenges related to research productivity and time allocation, which can slow their career progress. Balancing professional responsibilities with family obligations – especially in rural service roles – remains a persistent challenge for female TTF commissioners. This dual burden can amplify the stress that they experience and make their work more difficult.

(2) Gender bias and stereotypes

Female science and technology commissioners, confront gender bias and unequal resource distribution, which can limit their capacity for innovation and stymic career advancement.

(3) Inaccurate matching, resulting in incongruity with farmers' needs

In some regions, the current model for dispatching science and technology commissioners to rural areas is hindered by mismatched supply and demand of services, limited range of the technological services that are provided, and insufficient support for integrated industry development. Commissioners are often matched with farmers, businesses,

and cooperatives based solely on written descriptions that mention technical needs but often lack clarity about specific local conditions, which frequently results in services that fall short of actual demands being provided. Every TTF commissioner that is dispatched provides service in a particular industry – typically various forms of crop cultivation and livestock farming – but they tend to encounter a wide array of needs in the communities that they serve. The commissioners often struggle to adequately support advanced technology sectors as a result of the limited cross-disciplinary expertise that they generally possess, however, and also tend to give less attention to product processing and sales due to the focus that they tend to place purely on farming. Limited coordination with enterprises further restricts their ability to connect businesses with local communities, impeding their efforts to assist residents in addressing industry chain issues like product processing and marketing.

3.3.2 Lessons Learned

Firstly, as rural economies develop, demand for knowledge begins to extend beyond agricultural know-how to encompass areas such as mechanization, marketing, e-commerce and AI. Relevant government agencies should fully consider the alignment between expertise and market demands when initiating and matching commissioners with locations. The definition of "technical" talent should be broadened so as to introduce a more diverse range of expertise in rural areas.

Secondly, the TTF system, a critical apparatus connecting scientific research with rural innovation and entrepreneurship, provides channels and various forms of support that enable researchers to participate in rural industrial and economic development. Government-led and -guided deployments have brought new productive forces, such as research, technology and innovation, to agriculture, rural communities and farmers, and the experience of being a TTF commissioner has provided researchers with positive incentives, such as performance credentials, career promotions and other awards and honors. According to the UNDP's project reports, approximately 16% of China's TTF commissioners were women in 2006, while incomplete statistics from 2023 indicate that the proportion had increased to around 30%. This shift indirectly reflects the growing role of women in rural technological innovation but also continues to fall short of the overall percentage of female scientists and engineers in China, which comes to 45.8%.^[27] Further research and analysis needs to be conducted in order to identify factors that hinder women scientists from becoming commissioners and create more favorable conditions for women who may want to participate in rural development so as to further strengthen gender mainstreaming in the TTF system.

Thirdly, it is possible to apply the TTF model in international rural development and poverty alleviation. China's TTF system has played a significant role in poverty alleviation and rural development in the country. Over the past two decades, TTF commissioners from various fields have made contributions to the production and development of various regions, industries and socio-cultural environments. The repeated validation of the effectiveness of the TTF system transcends time, location, and culture, demonstrating its immense potential for application and promotion in international development.

Chapter 4: The Role of Women in Driving Industrialization

Contributing to agricultural modernization, cultural preservation, and industrial development, rural women play a crucial role in rural vitalization. Approximately 250 million women are engaged in production and entrepreneurship in China's rural areas, where they are key drivers of agricultural industrialization in addition to being beneficiaries of it.

A growing number of female entrepreneurs, cooperative leaders, and community wealth builders have been emerging with the rise of new industries. Empowering women in rural vitalization, particularly with regard to the development of agriculture and value chains, has vast importance and potential. Improving the standing of women living in rural areas and creating more and better opportunities for them has profound implications for gender equality, capacity-building and social status.

4.1 The Influence of Women in Marketization

The power of women has become increasingly evident in the process of agricultural marketization and has become an important force in promoting economic development and social progress. Women have demonstrated immense zeal and dynamism with regard to entrepreneurship and innovation. Their ventures generate a wealth of employment opportunities, especially in the realms of e-commerce, services, and culture, in addition to enriching markets with a variety of goods and services.

Engaging in production, processing, sales, and marketing, women play an active role in agricultural industrialization, which effectively propels the construction and development of agricultural product brands, and their role in decisionmaking on family farms and in agricultural businesses is growing increasingly important as well. Women also have a direct impact on agricultural industrialization and brand-building through their involvement in cooperatives, agricultural enterprises and community organizations. Their contributions inject new vitality into the development of the rural economy in addition to enhancing the value of agricultural products.

Case 12: Female Farmer Spearheads Rice Brand Building in Conjunction with Signature Product Revitalization Plan

In 2018, northern China's Tianjin City launched a plan to vitalize Xiaozhan Rice – a century-old sweet, sticky, and fragrant variety named after a town of the same name situated in the municipality's southern Jinnan District and one of its signature products. By 2020, Xiaozhan rice had been designated an agricultural product with a geographical indication (GI) in China, and in 2022, it was included in the country's National Premium Agricultural Brand Cultivation Program, which is an initiative that was launched by China's Ministry of Agriculture and Rural Affairs in order to comprehensively promote agricultural product brands related to rural vitalization, officially establishing it as a national agricultural brand.

In 2014, a prominent grain farmer named Wu Wenping started a venture known as the Chunhui Dadi ("Spring Returns to the Earth") Family Farm in Jinnan's Balitai Town. Ongoing enhancements in farming methods and a

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steady increase in the farm's cultivation footprint to 12,000 mu (approximately 800 ha) as of early 2024 have resulted in it growing into a cutting-edge agricultural operation at the heart of Xiaozhan Rice's primary production zone. The Chunhui Dadi Family Farm secured a trademark for a brand known as He Yue Sheng, which was part of an overall campaign to shift from fragmented agricultural practices to a consolidated model featuring standardized cultivation, processing, pricing, and branding and pursue market expansion.



Balitai Town, Jinnan District, Tianjin City-based large-scale grain producer Wu Wenping

The transformation that has occurred marks a move away from disunited endeavors with a singular focus on conventional farming towards a fully integrated, modern agricultural technology enterprise that encompasses the entire industry chain.

The Chunhui Dadi Family Farm employs 46 people as of early 2024, of which 25 are women. A cooperative comprised of farmers who grow rice on additional land in the area that Wu also runs provides employment opportunities for more than 200 additional rural women every year as well, which enables them to increase in their annual incomes by up to RMB40,000 to RMB60,000 each. Effective farm management has resulted in cultivation expertise increasing and those involved becoming more prosperous, and efforts are being made to help more female farmers achieve these goals.

The Chunhui Dadi Family Farm has been introducing and promoting new technologies, providing technical training in the area in order to advance the adoption of mechanized agriculture, which has enabled more than 500 farmers to do so, bringing the local mechanization rate to 90%. It also maintains a special fund dedicated to science outreach, routinely invites agricultural technology specialists to train members of its cooperative, and arranges for them to participate in events related to China's annual National Science Popularization Day and the annual Science and Technology Week. The farm has conducted more than 150 training sessions and 50 science seminars as of early 2024, educating over 2,700 farmers, and more than 80 agricultural machinery operators have earned vocational skill certifications.

4.2 Technology Helps Empower Women in Value Chain Development

The pace of rural vitalization has been accelerating as technology advances, and women have been playing an increasingly important role in the process. Technology has the ability to break gender barriers in addition to creating new employment opportunities and entrepreneurial platforms for women, which enables them to demonstrate their

distinctive flair and ingenuity in sectors such as agriculture, e-commerce and education. Innovative models and broader development paths serve as powerful forces in women's empowerment. For example, some regions have established incubators focused on women's entrepreneurship, which provide policy support, financial assistance, and technical guidance, so that women can realize their business aspirations. Fueled by technological advancement, women's contributions to rural vitalization are becoming more varied, injecting new energy and optimism into rural communities.

Case 13: Technological Innovation and Industrial Integration Boost Sericulture Industry in Hechi City, Guangxi

Mulberry cultivation, silkworm farming, and silk weaving are some of the significant contributions of ancient China. With minimal overhead requirements, the possibility of obtaining rapid returns, and the ability to function as an ideal avenue for side ventures, sericulture can serve as an important way for women to increase their incomes and become more prosperous in rural areas.

As the 21st century dawned, the silkworm industry – characterized by its high demand for land and labor – faced considerable challenges due to escalating land prices in China's traditional silk-producing regions, such as the Yangtze River Delta and the Pearl River Delta, which are located in the eastern part of the country. In response, an initiative designed to gradually shift sericulture to other areas known as the Westward Mulberry Migration Plan

was launched, with south China's Guangxi Zhuang Autonomous Region playing a prominent role. Guangxi's primary silk production hub, Hechi City has been vigorously pursuing the establishment of a RMB100 billion silk industry cluster that includes advanced processing facilities in areas such as silk refinement, printing and dyeing, apparel production, and accessory creation, and has been driving the convergence of the local silk industry's primary, secondary, and tertiary sectors.

Like Silk Moths Emerging from Cocoons, Women Spearhead the Development of the Sericulture Industry Chain

A 1990 graduate of Guangxi University's College of Agriculture with a major in sericulture, a woman named Wu Chunyan holds the distinction of being the first person from her village to obtain a university degree. In 1994, she began working at the sericulture office, Luocheng Mulam Autonomous



The Hechi City, Guangxi Zhuang Autonomous Region, branch of Guangxi Mobile – an enterprise specializing in mobile communication services – has developed a platform that facilitates the implementation of standardized rearing protocols known as the Guangxi Sericulture Big Data Cloud Platform, which includes a special intelligent husbandry system known as the Smart Silkworm Butler system, in order to address the low level of standardization that tended to exist and limited technological access and scalability that sericulturists tended to experience in the area, which has markedly enhanced silkworm survival rates and the quality of the cocoons that are produced.

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County, Hechi City, introducing advanced silkworm farming techniques in the community.

Wu piloted an "enterprise + base" vitalization model in an enclave in Siba Town, Luocheng County, known as Chongmaitun Village, and it became the primary silkworm farming hub for an office located in Hechi's Yizhou District dedicated to helping people in the area pursue the sericulture industry known as the Yizhou Silkworm Seed Station. The station began dispatching experts to Chongmaitun, offering hands-on training and providing essential resources, including silkworm eggs, disinfectant, and farming equipment, and local farmers began contributing their land and labor. Wu's efforts



Luocheng Mulam Autonomous County, Hechi City, sericulture office representative Wu Chunyan (left) provides guidance on the rearing of silkworm larvae to a farmer that produces silkworm cocoons.

eventually ignited a sericulture renaissance throughout Luocheng. Riding the wave of Hechi's sericulture movement, the amount of land devoted to mulberry cultivation in Luocheng grew from a little over 50,000 mu (3,333 ha) to almost 90,000 mu (6,000 ha) and yields nearly 20,000 metric tons of fresh silkworm cocoons per year as of 2024.

Wu eventually left the Hechi sericulture office and founded a cooperative that created 57 job opportunities, 38 of which were specifically reserved for women and 15 of which were reserved for members of families who are beneficiaries of poverty alleviation programs. Approximately 35,000 sheets of silkworm larvae, each of which includes around 28,600 eggs, are produced and distributed to local farmers every year, including members of 110 households that are part of poverty alleviation efforts and benefit significantly, which enables recipients to ultimately obtain RMB84 million of revenue from selling the resulting cocoons.

Women Fuel Synthesis of Primary, Secondary, and Tertiary Silk Sectors, Including by Pursuing Collaboration with Research Institutes

One of Hechi's pillar industries, sericulture makes it possible for farmers to increase their incomes and facilitates economic development in the city but has traditionally been focused on production and primary processing, resulting in low-added-value products and a lack of brand awareness. Wang Zhuo, director and general manager of an enterprise known as Jialian Silk Co. Ltd., aimed to transform the situation. Upon assuming control of the family business, she rejuvenated Hechi's conventional silk sector by implementing technological advancements and enhancing industrial practices.

"Collaborative innovations that enhance product technology and added value have resulted in the silk industry now encompassing the creation of skin-friendly raw materials, innovative fabrics, and cosmetic products, thus

generating new avenues for profit growth," Wang stated.

Jialian Silk has more than 700 employees, and women make up over 70% of the personnel in its production facilities. The firm is also committed to fostering the professional growth of women by providing skill enhancement training and career guidance.

In the agricultural sector, Jialian Silk has established premium cocoon production hubs and has been utilizing advanced smart mulberry and silkworm cultivation equipment. The company has also implemented models involving "contract farming" and the "enterprise + bases + cooperatives + farmers," which has facilitated cooperation with 44 povertystricken villages, and spends over RMB300 million procuring more than 6,000 tons of fresh cocoons from local producers every year as of 2024, which has made it possible for 37,500 rural households to increase their incomes and become more prosperous.

In the industrial sector, prioritizing technological innovation and product diversification, Jialian Silk has been consistently introducing new items that cater to market demands and



A view of a multifunctional mulberry cultivation and silkworm farming base located in Desheng Town, Yizhou District, Hechi City, known as the Liu Sanjie High-efficiency Ecological Sericulture Demonstration Zone. The base comprehensively utilizes sericulture resources, develops ancillary products, and pursues eco-tourism development and is an important part of the efforts Hechi has made with regard to steady sustainable and healthy mulberry silk industry development and the development of the overall mulberry silk industry chain for the purpose of promoting rural vitalization through industrial vitalization and bolstering high-quality regional economic development in recent years.



Jialian Silk Co. Ltd. director and general manager Wang Zhuo examines a silk shirt produced by the company. The Hechi-based business has been helping farmers in the area get involved with the silk industry, which has enabled them to boost their incomes and become more prosperous.

bolster the strength and competitiveness of its brand. Notably, the company has been selling more than 80,000 silk sun protection masks and over 100,000 silk quilts per year as of 2024. It has also strengthened cooperation with research institutes, successfully obtained 18 patents, and established a standardized technical management framework that encompasses everything from the management of high-quality raw materials bases to the design and manufacture of premium silk and textile products.

In the service sector, Jialian Silk has launched initiatives that incorporate silk culture, production methods and rural tourism. Tourists have the opportunity to engage with the silk production process and gain insight into sericulture industry culture. Concurrently, the company has established a comprehensive sales network spanning online and offline platforms in order to market its silk products both within China and internationally.

4.3 E-Commerce Helps Enable Women to Excel in Agricultural Modernization with Their Distinct Strengths

More opportunities and forums for women to shine are being created as marketization proceeds, which helps break down gender barriers and promotes gender equality. Achievements that women have made in the realm of work and business are motivating more women to pursue professional growth and personal fulfillment. The advancement of digital technology has led to more opportunities for rural women in areas such as production, daily life, education, employment and entrepreneurship. Elevating women's digital literacy and bridging the gender divide in the digital sphere are enduring objectives of the Chinese government and prerequisite for the collective advancement of women. Instruction methods such as distance education and online training enable women to access knowledge and acquire and develop skills and abilities in a convenient manner. Concurrently, the widespread adoption of internet technology and mobile payments have made it possible for women to engage in economic activities such as the sale and marketing of agricultural products and rural tourism more easily, which can lead to a greater sense of self-worth and economic independence.

Case 14: Capacity Building Initiative Enables Women Living in Rural Areas to Pursue E-commerce

In 2015, a charitable organization operating nationally known as the YouChange China Social Entrepreneur Foundation launched a special project involving partnership with governmental agencies, international bodies, and corporate entities that is designed to facilitate women's integration into the e-commerce supply chain known as the Women UP initiative.

Training programs are offered to housewives in the rural areas where Women UP operates and are regularly updated and enhanced in order to incorporate the developments that are being made in e-commerce. In the beginning, foundational courses covering platforms such as the Taobao online shopping platform, the WeChat social media platform, and the agriculturally focused Pinduoduo online retail platform were offered, and the programs have since expanded to include strategic video-



A diagram depicting the content and structure of the Women UP e-commerce training programs

oriented account planning, shop creation on the TikTok short video app and Kuaishou short video and social network app, and comprehensive livestreaming guidance as well as AI tool usage, which was added recently.

The programs are conducted both in-person and online and cover areas such as internet knowledge and concepts, e-commerce skills, product development, marketing strategies, women's leadership, and finance, with 20% of the material consisting of lectures and 80% consisting of practical exercises. Once the fundamentals are mastered, students participate in livestreaming sales contests within the classroom setting, where instructors offer mentorship and personalized feedback. Participants are encouraged to apply what they have learned and generate sales income during the training period in order to boost completion rates. The collaborative classroom environment that is engendered fosters mutual encouragement and support among trainees, reinforcing the skills and concepts that are taught.

Participants who finish the training then move on to a six-month incubation module, where they continue to

hone and improve their sales strategies and marketing abilities, gradually develop stable sources of revenue, and steadily increase their incomes. The project teams also help them build entrepreneurial resource networks that include suppliers, sources of financing, and sales and distribution channels and provide assistance with livestreaming engagement and e-commerce operations.

Zhang Jinyou, a woman of Miao ethnic group from Xiangxi Tujia and Miao Autonomous Prefecture, Hunan Province, who was born in the 1980s was deeply fascinated by e-commerce and pursued the endeavor on her own for about a year but did not make substantial progress. She was eventually able to take part in a Women UP training program co-organized by the IFAD, however, which enabled her to become proficient with livestreaming and gain a range of other skills, including financial management, and began working for an e-commerce company as a live



A diagram depicting the training process that the Women UP programs employ



Xiangxi Tujia and Miao Autonomous Prefecture, Hunan Province, resident Zhang Jinyou (right) promotes Xiangxi's specialty pork on a livestreaming platform.

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commerce host after a period of continuous study and practice, where she now earns approximately RMB7,000 per month.

As of October 2024, the project has been implemented in a total of 174 counties and cities in 21 of China's provincial-level administrative areas, such as Guizhou, Gansu, and Sichuan, has directly engaged over 20,000 people, boasts an impressive training completion rate of 88%, and has indirectly benefited more than 100,000 individuals since it was launched. Trainees who have ventured into live commerce have increased their annual incomes by a mean average of RMB16,256 (or RMB1,354 per month), with some increasing them by as much as RMB100,000 per year (or RMB8,300 per month), and a median average of RMB5,000 (or RMB416 per month).

4.4 Access to Capital Powers Entrepreneurship Among Women Living in Rural Areas

In rural areas, women are typically associated with domestic responsibilities, which restricts their ability to participate autonomously in productive and commercial endeavors. Gender bias, lack of financial literacy, asset shortages, and insufficient credit put women at a disadvantage when seeking financial resources. In response to these obstacles, the Chinese government and various financial institutions have launched initiatives designed to enhance the accessibility of financial services for women living in rural areas.

Multiple laws and regulations designed to promote gender equality and protect the rights and interests of women living in rural areas have been enacted in China. Government policies have helped gradually break down financial barriers that affect rural women and enabled them to participate in markets. Rural cooperatives and mutual financial support systems enable women to obtain loans and access other financial resources, share risk, and enhance market competitiveness in a collective manner. The government has also launched financial education campaigns in partnership with women's organizations and financial institutions in order to address the financial knowledge gap that often exists among rural women. The campaigns equip women with fundamental financial understanding and help them enhance their risk awareness and financial management abilities.

Many financial organizations have created financial products specifically designed for women living in rural areas, including microloans, green loans, and agricultural loans, with the intent of providing enhanced support for this group of borrowers. Featuring streamlined application processes and favorable interest rates, these financial products are designed to help women living in rural areas overcome the insufficient collateral that they often possess and high barriers to entry that they tend to encounter when seeking loans. For example, some banks have created special loans that are specifically designed to help female entrepreneurs get involved with modern agriculture and other commercial ventures.

The reach of financial technology solutions, including mobile payment systems and online banking, has been extending to increasing numbers of women. The combination of AI and financial technology in particular has reduced costs and led to a decrease in information asymmetry, which has helped solve the problem of small-scale farmers lacking adequate collateral or guarantors and made it possible for female farmers to access financial services at reasonable rates. Training AI models in the financial sector requires significant manpower as well, which can lead to the creation of many



employment opportunities for women in roles such as data organization and annotation.

Case 15: Innovative Green Finance Tools Support Women-owned Oyster Businesses

At the beginning of 2024, as the deadline approached to begin raising oyster larvae and formally start the current season of oyster farming, Lin Meili, an oyster farmer living on China's east coast in Rushan City, Shandong Province, experienced a shortage of funding. The oyster industry requires large amounts of investment, is high-risk, and is seasonal, and its asset-light nature makes it difficult to obtain collateral loans.

With an output value exceeding RMB10 billion, more area is devoted to oyster farming and more of the mollusks are produced in Rushan than in any other county-level city in China. Many oyster farmers and women-owned small and micro-sized enterprises engaged in oyster farming in the administrative area have been facing similar

difficulties with financing as those that Lin has experienced, however. In recent years, Rushan has implemented financial policies designed to support the development of micro, small, and medium enterprises (MSMEs) operating in the oyster industry and, as scientific research pertaining to the value of the oyster ecosystem with regard to carbon sinking and sequestration has progressed, it has also explored new ways to integrate green finance with oyster enterprises' production and operations and made many attempts to do so.

Financial service institutions operating



A staff member (left) from a financial institution in Rushan City, Shandong Province, explains green finance concepts to an oyster farmer.

in Rushan have developed a range of green financial products tailored to the needs of women-owned oyster enterprises under the guidance of the city's financial supervisory department, such as what's known as the Women's Oyster Loan. The products play a key role in supporting the green and low-carbon development of MSMEs in three main ways – resource allocation, risk management, and market pricing – and thus meet the needs of many oyster farming and women-owned enterprises in the oyster supply chain, such as Lin's. Leveraging big data technology, a local commercial bank issued a special, precisely tailored RMB1.28 million loan involving the combination of mortgaging and financing guaranteed with loan guarantors, for example, which effectively addressed her urgent requirements. The financial service innovation that Rushan has been facilitating has been bolstering the development of small and micro-sized oyster enterprises in the administrative area since 2024 – especially those that are owned and operated by women.

A significant driver of socio-economic development in rural areas, the green and low-carbon development of

MSMEs engaged in the agricultural sector also plays a crucial role in the realization of China's strategic "dualcarbon" objectives – achieving peak carbon dioxide emissions by 2030 and eventually attaining carbon neutrality.

4.5 Helping Women Improve Their Digital Literacy to Seize Emerging Employment Opportunities

Digital literacy refers to an individual's ability to effectively utilize digital technologies and resources in education, work, and daily life, including essential skills related to the operation of software, digital devices, and the internet, as well as the ability to filter, analyze, communicate and create information. In today's world, digital literacy has become a vital foundation for success in social, educational, and professional realms.

Enhancing women's digital literacy empowers them to acquire agricultural knowledge, manage production processes, and sell agricultural products in a more efficient manner. It can also enable them to participate in emerging economic activities more effectively, which can increase their household incomes and improve their quality of life.

Case 16: Enhancing Digital Literacy Boosts Employment and Incomes for Women Living Throughout Rural China

Leveraging emerging technologies like artificial intelligence (AI) as well as digital services and data annotation, the Ant Group, the Ant Foundation, and the China Women's Development Foundation, jointly launched an AI industry incubation project known as the A-Idol Initiative at the digital industrial bases in underdeveloped counties in China's central and western regions, with the aim of providing training for young people – primarily women – in areas such as AI training and cloud customer service, which has enabled young rural women to obtain high-quality employment in their local areas.

A-Idol Initiative

The main strategies associated with the A-Idol Initiative consist of a) integrating industry resources for the purpose of securing initial groups of digital orders; b) building county-level digital employment centers capable of training management teams and incubating local operating enterprises in collaboration with local governments; and c) providing ongoing skills training designed to help local young people, especially women, acquire technical skills, such as AI data annotation, in order to enhance their employability and establish local pools of digital talent.

Yonghe County, Linfen City, Shanxi Province, resident Guo Baoqing is a beneficiary of the A-Idol Initiative. Yonghe has a relatively underdeveloped economy, and, with few job opportunities, many of the women who are born there marry and focus on household duties after finishing high school. Guo used to be a housewife, and her husband's job was the sole source of income for the couple and their four children, which made life challenging. She completed an AI annotation training program, however, and secured a job that pays more than RMB5,000 per month. Mostly only requiring internet-connected computers and not necessitating specific regional resources, transportation networks, or other infrastructure, not physically demanding, and flexible with regard to hours and location, data annotation work can provide employment opportunities for women, persons with disabilities, and members of other disadvantaged groups.

The A-Idol Initiative has supported the establishment of 17 county-level digital employment centers in locations such as Jishishan County, Gansu Province; Qingjian County, Shaanxi Province; and Zunyi City, Guizhou Province, as of the end of 2023, which helped a total of over 5,800 people obtain employment in their local areas, 80% of which were part of agricultural households and nearly 70% of which were women. The average income of these employees is significantly higher than the overall per capita disposable incomes in the urban and rural areas that surround the areas they live in.



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Guo Baoqing (right) and other beneficiaries of the A-Idol Initiative AI incubation and training program annotate AI data in Yonghe County, Linfen City, Shanxi Province.

Homestay Management Training Program

Digital Mulan Homestay Manager Digital Literacy Training Project is designed for rural women and includes vocational skill instruction and digital literacy training. The digital literacy curriculum features modules on smartphones, computers, and the internet, as well as marketing, photography, videography, livestreaming, cybersecurity, media literacy and AI literacy. The program aims to cultivate a new generation of competitive

homestay staff in the digital era so as to help rural women seize employment and other income-generating opportunities brought about by the growth of rural tourism.

By June 2024, more than 4,000 women living in rural areas throughout China have received homestay management training, and many of them have gradually become industry experts. The people who get involved with these kinds of opportunities tend to experience significant improvements in personal satisfaction and happiness, strengthen their sense of selfworth, and even elevate their status within their families, in addition to achieving economic independence.



A digital literacy instructor (right) teaches guesthouse staff smartphone photography skills in Hinggan League, Inner Mongolia Autonomous Region.

4.6 Experience and Insight: Empowering Women to Take an Active Role in the Development of Rural Value Chains

Firstly, education and skills training targeted at rural women can be increased. Diverse training programs suited to women in areas such as agricultural technology, handicraft production, e-commerce, and family financial management can be developed and provided in order to adapt to the development conditions that exist in a given area and the needs of the women that live in it, which helps participants improve their levels of culture and education and employability, adapt to market changes, enhance their self-worth, upgrade their professional skills, attain gender equality, and reach their potential; injects new vitality into rural development; and promotes comprehensive vitalization and sustainable development in rural areas.

Secondly, more support related to information and resources can be provided for women who live in rural areas. Greater support, including financial assistance and market information, can be provided to key forces, such as female cooperative leaders and women who spearhead and develop various industries in a given area, so as to enhance rural women's resource and information acquisition capabilities, improve small farmers' organizational abilities, and provide policy measures that are more comprehensive and more targeted so as to help women get a better grasp of agricultural technology, management concepts and practices, and market dynamics, thereby enhancing their resource and information acquisition capabilities, enhancing participation, and facilitating a sense of gain with regard to rural vitalization, the pursuit and development of rural industries, and the construction of rural value chains.

Case 17: Special Training Initiative Empowers Female Farmers' Cooperative Chairs

In 2022, Visa Inc. launched an initiative designed to help rural female industry leaders enhance their abilities in collaboration with the China Foundation for Development of Financial Education, which is a nonprofit organization that helps the staff of financial institutions that serve rural areas enhance their abilities and members of the public improve their financial literacy, especially farmers, in line with its mission of alleviating poverty through financial education, known as the Jinhui Project. The organizations developed and implemented a training model focused on "women's empowerment + organizational cultivation + industry development" for "new rural women entrepreneurs" in partnership with the China Foundation for Rural Development and the Sichuan Mengdingshan Academy for Cooperative Development.

The training model that is employed includes four main aspects – classroom training, on-spot training, seed funding support, and market support. As a "Farmers' Business School," the academy empowers rural women in entrepreneurship in terms of capacity building, seed capital support, and the connection of market channels. The theory and practical training that are provided cover

areas such as branding and e-commerce trends and help A diagram depicting the four aspects of the training model that the Jinhui Project employs



the chairwomen who are involved and the cooperatives that they run improve and develop.

Thirdly, construction of specialized cooperatives and grassroots women's organizations can be strengthened. Specialized cooperatives can facilitate the provision of professional support in areas such as agricultural technology and marketing, enhance participation in various industries, and help women increase their incomes, while grassroots women's organizations help effectively safeguard women's rights and promote the specific implementation of policies related to gender equality. Demonstration sites devoted



Jinhui Project – Rural Revitalization and Women graduates pose for a photo. A total of 108 women have completed the program's classroom training as of October 2024, with 27 outstanding students having completed additional on-spot training that they were chosen to participate in and 10 each receiving RMB50,000 of seed funding as well as sales and market support.

to women's participation in rural vitalization that are guided by innovative development concepts, promote the spread of information throughout the areas they are located in, target women who had been living outside their hometowns and later return in order to start businesses, strengthen funding and resource support for women who are part of this group, promote the construction of new economic organizations for rural women, and enhance mutual assistance can also be created.

Wen Pinfen, a graduate of the Jinhui Project – Rural Revitalization and Women and chair of the Ya'an City, Sichuan Province-based Lanshunhong Woven Bamboo Cooperative, poses with a lampshade that was produced by her organization. Wen successfully obtained seed funding from the program and applied the business management and operations methods that she learned to Lanshunhong. She uses group chats on the WeChat social media platform to help get women living in the village that the organization is located in involved, especially those with disabilities, and to organize the design and production of woven bamboo products that are both practical and artistic, many of which become very popular and experience a lot of demand.



Chapter 5: Recommendations Based on the Empowerment of Rural Women in China for South-South Cooperation

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Playing a crucial role in promoting agricultural modernization and ecological sustainability as well as the development of rural communities, women are vital labor and innovation forces in rural areas. Several challenges continue to exist in the process of empowering rural women via science and technology, however.

Rural women tend to have a relative lack of digital skills and education and limited ability to use new technologies such as smartphones and the internet, and they may lack systematic skills training opportunities. Targeted measures should, therefore, be taken to help this group adapt to the digital transformation that has been occurring.

Women have fewer opportunities to obtain new equipment and access technical training than men do, which negatively affects their education and ability to apply technology to various endeavors.

Time constraints are another significant factor. Rural women often spend much of their time on housework and taking care of family members on top of agricultural responsibilities and thus have limited time available for other activities, which makes it hard for them to invest their energy in learning how to use new technologies and can negatively affect their confidence and motivation with regard to education.

The needs of female users of agricultural technology products tend to not be well-considered as well. Instructions and user interfaces are often not user-friendly enough, and products are generally not designed with women in mind. The needs of female users should, therefore, be fully considered in technological applications, and gender sensitivity should be factored in during the process of policy-making.

Despite these challenges, China's experience in helping to foster the independence of and promoting entrepreneurship and innovation among rural women with science and technology as well as participation in agricultural industrialization and rural vitalization has yielded significant results in the country and can function as a source of valuable insights for rural development in other developing countries.

The Pact for the Future outcome document that was adopted at the high-level United Nations Summit of the Future event on Sept. 22, 2024, indicates, "Sustained, inclusive and equitable economic growth and sustainable development can only be realized when all women, adolescent girls, and girls have their full human rights respected, protected and fulfilled."^[28] China's practical experiences with regard to these goals can be drawn upon elsewhere. Some recommendations are as follows:

Fully safeguard women's rights and interests, and strengthen support for women's participation when developing agricultural policies. Developing countries should establish and improve legal and policy frameworks that support women's participation in agricultural production, including institutional safeguards pertaining to land rights, resource allocation, and rights related to cooperatives. Governments should introduce more inclusive policies and incentive measures in order to enhance women's economic autonomy.

Encourage female scientists to contribute to rural development. Encourage more female scientists to apply their 48

expertise and innovation abilities to rural development via incentive policies and resource support. The technological literacy and economic vitality of entire communities can be improved by establishing dedicated research funds, entrepreneurship support programs, and technological projects designed to attract female talent who may be interested in engaging in the promotion of agricultural modernization and agricultural technology and the upgrade of rural industries.

Provide targeted financial support for rural women. It is recommended that governments and financial institutions create and implement specialized microcredit, subsidy, and risk guarantee policies so as to ensure access to the capital required for agricultural production and entrepreneurship in order to address the financial challenges that they often face. It is also suggested that flexible, low-interest loans, interest subsidies, and unsecured loans are made available in order to help women overcome financial bottlenecks and successfully engage in agricultural production and innovative entrepreneurship.

Strengthen grassroots women's organizations and cooperatives. Establishing and improving women's organizations at all levels, enhancing their service capacities, and expanding their reach can help women access support with regard to resources, technology, markets, and other aspects of agricultural production. At the same time, women can be encouraged to join or establish cooperatives in order to integrate resources and enhance the scale and modernization of agricultural production. Women's organizations and cooperatives can also provide platforms for technical training, information sharing, and market expansion, which can boost women's market competitiveness and economic independence while promoting sustainable development in rural communities.

The FAO's Status of Women in Agrifood Systems report notes, "Capacity development creates opportunities in more profitable agrifood-system activities."^[29] Empowering women in agricultural production via innovation can significantly enhance their productivity, economic statuses, and social participation, which, in turn, drives agricultural modernization and fosters sustainable rural economic development. China's experience in empowering rural women through innovation can serve as a reference for other developing countries.

Understand the needs of women in agricultural production, and promote gender-friendly technological innovation. A deeper understanding of the specific needs of rural women with regard to agricultural production, especially in areas such as labor intensity, time allocation, and tool usage, helps make it possible for them to better harness their unique potential in agriculture. Promoting gender-friendly technological innovation, such as development of lighter and more-efficient agricultural tools and machinery and catering to the operational needs of female farmers, is an effective way to enhance women's productivity and sense of participation.

Accelerate construction of digital infrastructure in rural areas in order to support women's participation in digital agriculture. The informatization of rural areas can be promoted by strengthening and expanding digital infrastructure, including internet and mobile communication networks, particularly in remote regions. Such an endeavor functions as a solid foundation for the facilitation of women's engagement in digital agriculture, online marketing, and e-commerce, which results in more sales channels for agricultural products and enhances market competitiveness.

Technology can be used to improve working environments for female agricultural workers. Technological innovations make it possible to improve working environments, reduce labor intensity, and enhance work safety

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and comfort for female agricultural workers. The application of technology such as smart machinery and automated irrigation systems can help women free themselves from heavy manual labor and ensure their safety while operating machinery.

Help female farmers improve their scientific and technological literacy, digital skills and abilities, and agricultural machinery proficiency. Ensure the right to education for rural women while offering systematic technical training in order to help them master the ability to operate agricultural machinery and improve their ability to operate modern agricultural tools and equipment. Digital agriculture training can also be provided in order to boost digital skills and literacy, which enables participants to play a greater role in areas such as precision agriculture and intelligent management, thus advancing the modernization of agricultural production.

Appendix: Table Outlining Policy Documents Supporting Women's Participation in Rural Development and Promoting Innovation and Entrepreneurship in Rural Areas (Partial List)

	Policy Document	Description/Benefit to Rural Women
2018	Opinions on Implementing the Rural Vitalization Strategy	Put the "Women's Action for Rural Vitalization" initiative into effect
	Opinions on Implementing the "Women's Action for Rural Vitalization" Initiative	Proposed specific measures and targets that clearly recognize the vital role of women in the implementation of rural vitalization
2020	Development Plan for Digital Agriculture and Rural Areas (2019-2025)	Focuses on the integration of digital technology with agricultural and rural economies, regards data as a key factor in production, and strives to build data-based resource systems and strengthen digital production capacities, with digitalization and industrialization as the main themes
2021	Opinions on Comprehensively Promoting Rural Vitalization and Accelerating Agricultural and Rural Modernization	Proposed policies pertaining to the cultivation of female talent. Emphasizes women's roles and capabilities in rural vitalization
	Opinions on Implementing the "Women's Action for Technological Innovation" Plan	Helps harness the power of female technology researchers by being more attentive to them and investing more in their work
	Several Measures Supporting Female Talent in Playing a More Prominent Role in Science and Technology	Helps encourage female talent to participate in sci-tech innovation
	Outline for the Development of Chinese Women (2021-2030)	Helps ensure that rural women enjoy equal economic rights and interests as men; supports women's active participation in rural vitalization
	National Action Plan for Enhancing Digital Skills and Digital Literacy	Helps farmers enhance their digital skills, effectuates digital literacy education and skills training for women, helps strengthen the ability of women to participate in economic life using the internet, and provides guidance related to online work and the creation of online businesses for women living in western China and remote parts of the country
2022	Action Plan for Digital Rural Development (2022-2025)	Promotes the research and development of intelligent agricultural machinery and equipment suited to various environments and advances the integrated research and systemic demonstration of agricultural machinery, agronomy and information technology
	Law of the People's Republic of China on Safeguarding the Rights and Interests of Women (2022 Revision)	Added several provisions regarding the rights of rural women, including land rights
	Circular Pertaining to Technical Task Force Participants Placed in Key Counties Receiving National Rural Vitalization Assistance	Adjusted the technical task force system to facilitate rural vitalization
2023	Opinions on Fulfilling Key Comprehensive Rural Vitalization Promotion Work in 2023	Helps protect women's rights within collective economic organizations in rural areas.
	Action Plan Covering Promotion of Large- scale Equipment Upgrade and Consumer Goods Trade-in	Supports the upgrade of transportation equipment and outdated agricultural machinery in order to accelerate structural adjustment of agricultural machinery
2024	Law of the People's Republic of China on Rural Collective Economic Organizations	Reaffirms the ability of women to enjoy equal rights as men and states that their rights and interests in rural collective economic organizations shall not be violated on the grounds of having an unmarried, married, divorced, or widowed status or not having a male in their household

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