

Green Transformation of Agricultural Production: Underlying Logic, Dilemma, and Viable Pathway*

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Abstract The green transformation of agricultural production plays a crucial role in promoting the high-quality development of agriculture and achieving rural revitalization. In order to create favorable conditions for this to occur, it is essential to establish effective connections, transformation, and mutual support between capital endowment, external environment, and farmers' green concepts. Additionally, the contracting of agricultural production facilitates service-oriented scale operations, while the deep integration of "Internet +" and agriculture with the advancement of green agricultural technology provides an inexhaustible impetus for it. However, China's current green transformation of agricultural production continues to encounter challenges such as the depletion of a high-quality labor force, obstacles to building trust in the promotion of technology, and an underdeveloped green agricultural products market. To address these challenges, it is imperative to promote embedded agricultural technology which can catalyze the green contracting of agricultural production. Furthermore, advocating for the consumption of green agricultural products will also be beneficial in overcoming these challenges.

Keywords green development, transformation of agricultural production, green technology system, rural revitalization

1 Introduction

Since the reform and opening up, China's agricultural production has garnered considerable attention worldwide due to its remarkable achievements. According to data of National Bureau of Statistics in 2020, the total output value of agriculture, forestry, animal husbandry, and fishery reached 13.778217 trillion yuan, with the agricultural output value accounting for 7.174823 trillion yuan. However, along with these achievements, several challenges have emerged. The utilization rate of water and land resources has declined, agricultural non-point source pollution has become a significant concern, and the quality and safety of agricultural products face increasing hidden risks (Jin et al., 2020; Shi et al., 2016). These problems exacerbate the conflicts among population, resources, environment, and economic

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development, posing significant hurdles to achieving comprehensive, coordinated, and sustainable development of China's economy and society, and also hindering the ability to meet people's growing needs for a better life. Therefore, it is crucial to expedite the transformation of the agricultural development model and actively advance the green transformation of agricultural production.

Promoting the green development of agriculture serves as both a strategic measure to address the resource and environmental crisis caused by conventional agricultural practices and an opportunity to deepen the structural reform of the agricultural supply side while advancing the strategy of rural revitalization (Chen, 2017; Yu, 2018). Since the year 2012, with the convening of the 18th National Congress of the Communist Party of China, the central government has placed significant emphasis on green development within the economy and society. A series of policies and measures have been introduced to promote the green development of agriculture, and a system of agricultural subsidies and a mechanism of incentives and restraints steering toward green ecological conservation have been proposed. These actions have facilitated the green transformation and advancement of agriculture in China. In August 2021, the Ministry of Agriculture and Rural Affairs of the People's Republic of China, along with five other departments, jointly issued the *Agricultural Green Development Plan of China during the 14th Five-Year Plan*. This plan represents China's first specialized initiative for the green development of agriculture, guiding the

green transformation of agriculture during the 14th Five-Year Plan period. The plan sets forth comprehensive arrangements and specific deployment, demanding intensified efforts to promote green development across agriculture by 2025 and to achieve significant progress in the green transformation of rural production and lifestyle.

The extant literature on the green transformation of agricultural production primarily focuses on several aspects. Firstly, the concept and definition of the green transformation of agricultural production lack clear and unified consensus within the academic circle. However, from a practical perspective, green transformation of agricultural production adheres to the principle of ecological and environmental protection. It aims to increase the supply of green and high-quality agricultural products by improving the local environment, product structure, production processes, and waste management. The objective is to balance economic and social development and resource and environmental protection (He, 2021). Secondly, there is a discussion on how to promote the ideas and strategies for the green transformation of agricultural production. For instance, Zhang et al. (2021) propose the use of systematic scientific thinking to guide the green transformation of agricultural production. This approach involves considering not only the correlations among horizontal factors and vertical links within agricultural green production practices but also situating agricultural green production within the context of the entire industrial system and social-ecological system (Zhang

et al., 2021). Thirdly, research has explored the involvement of different agricultural management entities in the green transformation of agricultural production. For example, Mo and Zhang (2021) analyze typical cases to uncover the internal logic behind urban group participation in driving the green transformation of small-scale farmer production. The fourth lies in learning from foreign experience in the green transformation of agricultural production. For example, Zhang and Jin (2020) comb the specific policy design, effects, and inspirations of the Netherlands in promoting the green transformation of agriculture. They strongly advocate for the adoption of a sustainable development model that integrates both crop cultivation and animal husbandry practices, strengthening the promotion and application of recycling technology, and establishing and improving a policy and regulatory system, all of which can effectively facilitate the green transformation of agriculture in the Dutch context (Zhang & Jin, 2020).

It is evident that current research perspectives on the green transformation of agricultural production primarily concentrate on general theoretical investigations and micro-level studies. However, there seems to be a relative dearth of comprehensive research conducted at the macro level, particularly in terms of holistic examinations of the green transformation of agricultural production. In light of this observation, in order to fulfill the imperative requirements for realizing the green development of agriculture during the 14th Five-Year Plan period, this paper aims to address the underlying

logic and driving forces behind the green transformation of agricultural production. Moreover, it scrutinizes the existing and future constraints faced in achieving the green transformation of agricultural production. By doing so, this study seeks to provide viable pathways and approaches that can facilitate the smooth advancement of China's agricultural green development throughout the 14th Five-Year Plan period.

2 Underlying Logic for the Green Transformation of Agricultural Production

Farmers play a crucial role as decision-makers and implementers in agricultural green production. Their ability to adopt "green" practices serves as a pivotal starting point for initiating the green transformation of agricultural production (Dong & Mu, 2019). However, the green transformation of agricultural production is characterized by such challenges as significant investment requirements, high risks, long cycles, and slow effects (Zhang et al., 2019). For farmers, this transformation is not solely constrained by their own capital endowment and awareness at the micro level. It is also influenced by the external environment at the macro level, which can impact the progress of the production's green transformation. It is important to emphasize that the occurrence of the green transformation of agricultural production is not solely determined by these individual factors or their simple combination. Rather, it relies on the effective interconnection, transformation, and mutual support of

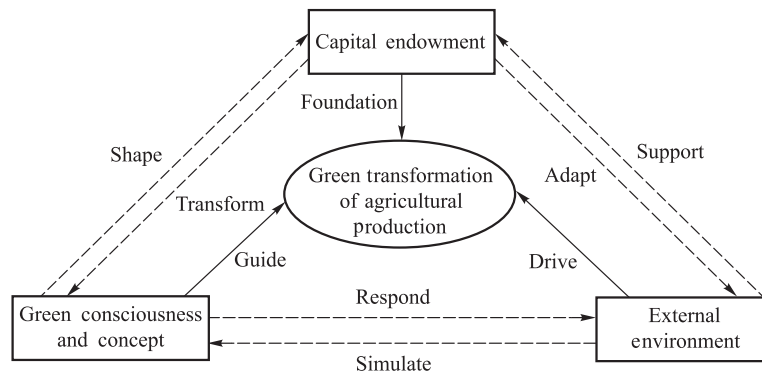


Figure 1 Underlying Logic for Green Transformation of Agricultural Production

various elements, creating necessary conditions for the transformation to take place (see Figure 1).

2.1 | Capital Endowment Underpins the Green Transformation of Agricultural Production

According to Pierre Bourdieu's *Theory of Practice*, capital refers to a collection of resources and power that individuals can utilize, serving as a crucial prerequisite for their survival within the social sphere. Individuals can develop common-sense practical behaviors by possessing a minimum amount of capital across various dimensions, including economic, cultural, and social domains (Bourdieu & Wacquant, 1998). In the context of agricultural production, the participation behavior of farmers in the green transformation can be seen as a decision-making process influenced by their assessment of the existing capital endowment within their families, taking into account specific field conditions and habitual factors. The green transformation of agricultural production may face constraints due to insufficient capital endowment to meet the needs of corresponding behaviors, resulting in a limited willingness or even resistance in

this respect. Increasing the overall capital endowment of farmers across different types will make for enhancing farmers' inclination toward green transformation (Zhang et al., 2017). Considering that farmers' decisions regarding the green transformation of production involve comprehensive evaluations of how different elements of their capital endowment align and maintain dynamic balance, variations in capital endowment structure give rise to divergent effects on overall capital endowment. For instance, in the case of green transformation of agricultural production, farmers possessing predominant economic and social capital are more inclined toward embracing green transformation (Liu et al., 2019). Hence, an organic integration of growing capital endowment accumulation and optimization of capital endowment structure serves to underpin the successful implementation of the transformation.

2.2 | External Environment Propels the Green Transformation of Agricultural Production

Farmer household management is characterized as a dynamic and open system with intricate connections to other sectors. It involves observing external changes and trends, taking appropriate measures,

and engaging with the external conditions to make rational adjustments based on their own circumstances. The green transformation of agricultural production is primarily influenced by the combined shaping of the industrial and institutional environments. The industrial environment plays a significant role in influencing the decision to pursue a green transformation of agricultural production. The industrial environment encompasses factors such as competition in green production, the level of collaboration among farmers, and market demand. These factors impact farmers' reliance on green production, adjust the relative benefits and costs associated with green transformation, and affect the uncertainty of its performance and resource demand. Consequently, the value effect of green transformation is influenced by the industry's environmental dynamics (Li et al., 2020; Shen & Duan, 2018). Furthermore, the green transformation of agricultural production is propelled by the broader institutional environment, which includes formal environmental regulations and informal institutions (Chen, 2018). Theories of the sociology of organization suggest that external norms, values, and traditional culture within the institutional environment exert pressure for convergence on organizations and individuals operating within the field, being that these are recognized by most organizations and individuals. This leads organizations and individuals to adopt widely accepted behaviors and practices, regardless of their efficiency, in order to conform to the "mechanism of legitimacy." Hence, it is evident that the institutional environment

significantly influences the decision-making process and implementation of the green transformation of agricultural production. As a result, the green transformation of agricultural production represents a continuous process aimed at optimizing and coping with the allocation of agricultural resources driven by the external environment.

2.3 | Green Awareness and Concept Guide the Green Transformation of Agricultural Production

The green transformation of agricultural production represents a profound revolution in the concept of agricultural development. It encompasses substantial changes in agronomic processes, technical means, and material equipment. More important is its impact on farmers' perceptions regarding the relationship between humans, nature, agricultural production, resources, and the environment (Tan, 2015). The concept of green development sparks the formation of green production methods. This entails a fundamental shift away from the extensive agricultural development mode characterized by a single-minded pursuit of output growth, competition for resources, and consumption. Instead, emphasis is placed on establishing a green production mode that permeates every aspect of agricultural production. Green agriculture emerges as a novel phenomenon in the context of green development. Its objective is to achieve comprehensive consideration of economic, social, and ecological benefits. Currently, the social and ecological benefits of green agricultural development are

significant, but its economic benefits are not as pronounced, and its demonstration benefits are not strong. To address this, it becomes crucial for farmers to cultivate green awareness and concepts, ensuring that these notions translate into conscious actions. True comprehension of the green production path, coupled with a clear understanding of why and how to embrace it, enables farmers to develop a genuine consciousness of the green transformation as a development concept (Duan, 2020). Once farmers have internalized this concept, they can proceed to implement it through deliberate actions. It can be inferred that the effectiveness of green agricultural development is directly influenced by farmers' awareness and concepts of green production.

3 Impetus of the Green Transformation of Agricultural Production

Although China's agricultural development faces challenges such as tighter resource and environmental constraints and limited awareness of green production, there are positive developments that contribute to the transformation. One significant advancement is agricultural production contracting, which has successfully established an organic connection between small farmers and modern agriculture. This approach not only alleviates the growing pressures on resources and the environment but also drives the green transformation of agricultural production. Furthermore, the emergence of internet-empowered

agriculture has created favorable conditions and expanded opportunities for the adoption of the transformation. Moreover, scientific and technological advancements in the field of green agriculture offer valuable solutions for the continuous green transformation of agricultural production.

3.1 | Agricultural Managed Services Promote the Green Transformation of Agricultural Production

Agricultural managed services are a method of managing agriculture whereby farmers and other agricultural management entities delegate some or all of the tasks involved in agricultural production, such as plowing, planting, pest control, and harvesting, to service organizations. This arrangement is made while ensuring that the rights to land contracts and management remain unchanged. Agricultural managed services play a significant role in promoting the green transformation of agricultural production. One key advantage of agricultural managed services is its capability to alleviate the constraints that hinder the green transformation of agricultural production. With around 210 million small-scale farmers operating less than 10 *mu* (a measure of area, 1 *mu* \approx 666.67 square meters) of cultivated land in China (Han, 2018), part-time and decentralized operations are prevalent. These operating forms present severe limitations on production factors like land, labor, and capital, making moderate-scale agricultural management essential for modern agriculture. Under the system for separation of the ownership rights, contract rights and management

rights for contracted rural land, there are two main ways to achieve moderate-scale agricultural management: direct transfer of land management rights to realize traditional-scale management and indirect agricultural scale management through innovative agricultural managed services (Zhang, 2020). As the costs and risks associated with land transfers increase, there is a growing need to achieve scalability through agricultural managed services. Additionally, agricultural managed services enable the introduction of green production factors directly into agricultural practices. Dedicated managed service organizations possess modern agricultural production factors such as capital, technology, and equipment, allowing them to demonstrate, apply, and promote green production technologies like scientific fertilization and unified prevention and control. Through the supply of elements, technologies, and services, they effectively introduce advanced and applicable varieties, inputs, technologies, and equipment to prop up agricultural green production. Furthermore, the cost-saving and efficiency-enhancing advantages resulting from the scale of agricultural managed services enable service organizations to improve standardization, mechanization, and specialization. This progress provides robust support for the green transformation of agricultural production. Agricultural managed services, as a new form of agricultural management, holds immense potential for development and vitality. By the end of 2020, the contracted agricultural managed services area had exceeded 1.6 billion *mu*, with over 900 million *mu* dedicated to food crops,

benefiting around 70 million small farmers. A stable and active agricultural managed services market will strongly promote the green transformation of agricultural production.

3.2 | “Internet +” Empowers the Green Transformation of Agricultural Production

With the rapid penetration of the internet into the agricultural industry chain, the concept of “Internet +” has become deeply integrated with various aspects of rural e-commerce, logistics of agricultural products, agricultural modernization, and agricultural services. This integration has emerged as a significant factor profoundly influencing the green transformation of agricultural production. The integration of agriculture with mobile internet, Internet of Things (IoT), and other technologies has played a crucial role in upgrading and leapfrogging conventional green transformation practices in agricultural production. Firstly, the internet enables instant and direct communication channels, facilitating zero-distance communication between technology extension personnel and farmers. Through social media platforms, technology extension personnel can interact with farmers using text, pictures, voice, and video. They can share real-life examples of successful green agricultural technology applications, ensuring that farmers grasp the essence of these technologies and provide essential support for the green transformation of agricultural production. Secondly, leveraging internet thinking and technologies to revolutionize traditional agricultural production allows

for precision farming, professional management, and scientific practices. This approach optimizes the allocation of resources, streamlines input-output management, enhances production efficiency, promotes energy conservation and pollution reduction, and ensures the production of green, safe, and high-quality agricultural products. Furthermore, the development of agricultural e-commerce acts as a driving force behind the green transformation of agricultural production. Driven by “Internet +”, the online sales mode of agricultural products e-commerce has emerged and is developing rapidly. According to *Report on China’s County-Level Digital Agriculture and Rural E-Commerce Development (2021)*, in 2020, online sales of agricultural products in counties across the country reached 350.761 billion yuan, marking a year-on-year increase of 29%. This shift in sales models not only disrupts traditional approaches but also enhances farmers’ income by restructuring the agricultural value chain and deepening the value-added aspect of agricultural products. Consequently, this increase in income serves as an incentive for farmers to invest further in productive endeavors. Furthermore, promoting agricultural products via e-commerce exposes farmers to a greater awareness of green agricultural products. This exposure stimulates new thinking among farmers regarding production methods and encourages them to embrace and adopt practices that promote the green transformation of agricultural production.

3.3 | Green Agricultural Technology Bolsters the Green Transformation of Agricultural Production

Green agricultural technology plays a vital role in enhancing production efficiency, environmental protection and modification, and facilitating the green transformation of agricultural production. First and foremost, green agricultural technology not only enhances farmland productivity but also greatly boosts labor productivity and resource utilization. It effectively integrates ecological systems with economic systems. For farmers, expected utility or maximizing profits is the key consideration when making production decisions. Therefore, the economic sustainability of green production is fundamental for implementing environment-friendly agricultural practices, with green agricultural technology serving as its essential foundation. Through efficient resource allocation, green agricultural technology comprehensively enhances the ecology and environment improvement. This not only saves costs and improves efficiency but also establishes a favorable interactive relationship between humans and nature, retaining the characteristics of nature and resulting in a positive effect of productivity progress on green agricultural capital accumulation. Technological innovation holds the primary significance in the green transformation of agricultural production. By leveraging modern science and technology, this transformation aims to shift from the extensive development mode characterized by high investments, consumption, and resource exploitation. The application of biotechnology,

engineering, environmental, information, and new material technologies expands the boundaries of agricultural production, enabling precise and environmentally friendly input of factors, intensive and efficient production, and safeguarding agricultural resources (Wang, 2016). The technology system serves as a robust support for the green transformation of agricultural production. In promoting the development of green agriculture, great emphasis should be placed on the supporting role of science and technology in driving this transformation. To build a powerful engine for advancing the green development of agriculture, China's Ministry of Agriculture and Rural Affairs issued the *Technical Guidelines for Green Development of Agriculture (2018—2030)* in 2018, with a focus on establishing a technical system that underpins the green development of agriculture.

4 Dilemmas of Green Transformation of Agricultural Production

Promoting the green transformation of agricultural production is a significant endeavor in driving China's green agricultural development. Despite the evident accomplishments made thus far, there are still numerous challenges that must be effectively addressed during the process of achieving the green transformation of agricultural production.

4.1 | Loss of High-Quality Agricultural Labor Force Weakens Human Capital

The successful implementation of agricultural green production, the adoption of sustainable production methods, and the ultimate realization of green production methods rely heavily on the knowledge of human capital within the agricultural labor force. Unfortunately, the ongoing challenges surrounding the aging and by-business nature of the agricultural labor force have resulted in a gradual decline and weakening of agricultural human capital. This situation poses obstacles to the widespread adoption and application of green production technologies, thereby impeding the overall progress of green transformation of agricultural production. The accelerated aging of China's agricultural laborers is evident due to the increasing elderly population and the selective migration of rural labor (Yang, 2018). Compared to younger and middle-aged laborers, older laborers generally face limitations in acquiring and implementing agricultural technology, as well as processing information. These factors hinder the effective utilization of green production technologies and practices in agricultural production. Data from the seventh national census reveal that the proportion of individuals aged 60 and above in rural areas has reached 23.81%, marking an approximately 8% increase compared to the previous census. Moreover, due to more younger and middle-aged laborers migrating to urban areas than returning to rural ones, the aging trend in rural areas is expected to persist. Moreover, by-business

has become prevalent among Chinese farmers and represents a common mode of production behavior. Looking at the statistics of migrant workers from 2013 to 2019, the amounts have steadily increased. However, influenced by various factors such as the slowdown in growth rate and the COVID-19 pandemic, According to the *Monitoring Survey Report on Rural Migrant Workers in Cities in 2020*, the total number of migrant workers nationwide fell to 285.6 million in 2020. Considering the rural population of 509.92 million in 2020, as reported by the National Bureau of Statistics, it becomes apparent that migrant workers now account for more than 56% of the rural labor force. The prevalence of migrant workers and by-business leads to a shift in farmers' focus toward non-agricultural industries. Consequently, the effective supply of agricultural labor and other essential factors for agricultural production decreases, resulting in reduced willingness to allocate labor to labor-intensive and potentially "inefficient" agricultural production practices (Zou et al., 2018).

4.2 | Trust Obstacles in the Promotion of Green Agricultural Technology

Promoting the green transformation of agricultural production hinges on the application of technology, which necessitates the widespread adoption of green agricultural technology. However, the current efforts to promote green agricultural technology in China encounter certain difficulties. One major obstacle is farmers' risk aversion, which makes it

challenging to successfully implement green agricultural technologies. Green agricultural technologies are primarily emerging technologies with uncertain profit prospects and associated risks. Considering the potential loss of income, farmers often opt for more stable conventional agricultural production methods. Despite the active introduction and promotion of demonstration green agricultural technologies by local governments, there are still many farmers who resist using them or even engage in practices that oppose their implementation. This voluntary resistance poses a significant barrier to the promotion of agricultural green production. Another challenge faced by the promotion of green agricultural technology is the crisis of trust. Effective promotion of agricultural technology is crucial for supporting the green development of agriculture and serves as a vital policy tool for governments' support of green production practices. The rural agricultural technology promotion system comprises both a public welfare system and a commercial system. The latter offers agricultural technology services provided by manufacturers and enterprises with the aim of selling agricultural materials. In practice, these services often take the guise of technical training but ultimately involve the sale of agricultural materials (Feng, 2017). Some salespeople, driven by the profit motive, sell expired, ineffective, or inferior agricultural means of production. This unethical behavior not only results in economic losses for farmers but also affects their trust in promotion work. The so-called "technical training" increasingly undermines the credibility

of public welfare agricultural technology promotion. Consequently, many farmers adopt a skeptical or questioning stance toward the technical guidance provided by personnel involved in public welfare agricultural technology promotion. This directly hampers the promotion and widespread adoption of green agricultural technology.

4.3 | Lagging Development in the Green Agricultural Products Market

As consumption plays a vital role in production, its retroaction to production cannot be overlooked. The promotion of green agricultural products and a market for them are crucial for facilitating the green transformation of agricultural production. One of the key factors in driving the green transformation in agriculture is ensuring that green production aligns with the economic goals of farmers. The reluctance of farmers to engage in green production is primarily the result of low short-term economic returns associated with it. To address this issue, developing a market for green agricultural products can play a significant role. It can help improve the economic rewards for farmers engaged in green production, rectify the imbalance caused by positive environmental externalities, and incentivize farmers pursuing green production to obtain profits that cannot be realized in conventional production (Liu, 2020). Another important aspect is that the green transformation of consumption forces the green transformation of agricultural production. When integrating green concepts, changes in consumption patterns, preferences, and structures

will inevitably impact the production sector. This results in adjustments to the allocation of production factors and leads to improvements in the quality and efficiency of the agricultural product supply system. However, there are two primary challenges currently faced by China's agricultural products market. Firstly, consumers have a relatively low acceptance of green agricultural products. Many consumers prioritize high quality and low prices when making agricultural product purchases. Their main reason for refusing to purchase green agricultural products is the higher price (Jiang et al., 2021). Secondly, there is an issue of adverse selection in the market. Agricultural products possess attributes of experience goods and trust goods, leading to asymmetric information about quality and safety between manufacturers and consumers. Consequently, there is a situation where inferior products tend to drive superior products out of the market. Green agricultural products, despite deserving higher prices, struggle to sell at their fair value and are undermined by popular goods of fair average quality. The underdeveloped state of China's green agricultural products market prevents the full realization of the positive externalities associated with green agricultural production. This results in significant price disparities in agricultural products, causing financial losses for green agricultural production entities. Consequently, this hampers enthusiasm for green production and significantly hinders the green transformation of agricultural production.

5 Feasible Routes for Boosting the Green Transformation of Agricultural Production

Promoting the green transformation of agricultural production is a complex project and time-consuming endeavor that cannot be achieved instantaneously. To ensure successful implementation, it requires ongoing support from both the supply side and demand side, along with coordinated efforts from farmers, governments, and consumers. The green transformation of agricultural production encompasses various critical aspects that need to be addressed. These include but are not limited to the following.

5.1 | Embedded Promotion of Green Agricultural Technology

The embedded promotion of green agricultural technology should be solidly carried out to enhance trust in technology promotion, reduce costs of technology introduction and transaction, and realize the popular application of green agricultural technology. To effectively promote agricultural technology, it is crucial to develop plans that align with local green production practices. These plans should consider the specific ecology and environment and the realities of agricultural technology promotion services. By closely integrating farmers' production and living conditions, as well as their needs, measures can be introduced for the application of green agricultural technology. This approach ensures that technology promotion services focus on the key aspects and core content. Local conditions should

be taken into account when formulating technology promotion plans, ensuring the rational application of green agricultural technology across all production stages. By doing so, it is able to improve the acceptance and efficiency of using green agricultural technology. Additionally, establishing a dedicated team of professionals in green agricultural technology promotion is essential, with a view to aligning the entry point of technology promotion. Agricultural technology promotion typically involves a team of experts, agricultural technicians, and local technical elites. Experts should actively engage with villages, households, and fields to address the question of where technology comes from. Agricultural technicians and local technical elites should focus on how to effectively promote technology in villages and households. Demonstration sites, local experts, and village-level organizations are typically selected as entry points for technology promotion. Careful selection of these entry points enables the promotion of agricultural technology to expand from specific areas to larger regions, thereby enhancing the efficiency and quality of services provided. Lastly, information collection points should be established throughout the agricultural technology promotion process. As agricultural technology becomes more embedded, the number of participants in the promotion service continues to grow, along with increased expectations regarding the quality, content, and demand for agricultural technology promotion services. To address this, efficient technology diffusion can be achieved by collecting information, swiftly responding to inquiries, and providing

timely feedback.

5.2 | Promotion of the Green Transformation of Agricultural Managed Services at Multiple Levels

Promoting the high-quality development of agricultural managed services involves utilizing the professional services provided by service organizations to introduce green production technology into agricultural practices. The goal is to allow for agricultural managed services to lead and propel the adoption of green methods in agriculture. First, to support the green transformation of agricultural managed services organizations, effective support and guarantee mechanisms need to be established. This can be achieved by encouraging and supporting well-developed service entities and new agricultural business entities to engage in agricultural managed services. Additionally, offering reputational encouragement, financial subsidies, or project preferences to service organizations actively involved in green production practices can incentivize more organizations to embrace green agricultural production. Emphasizing the importance of key managed services links and service content is another crucial aspect. This can incorporate links and content that can make up for the shortcomings of agricultural green production into the scope of key managed services. Special attention should be given to significant agricultural products, taking into account the varying effects of different managed service models on farmers' adoption of green production practices. Prioritizing subsidies for weak areas in green production within agricultural

managed services is essential. Furthermore, it is necessary to fully utilize the potential of small farmers to engage in green production through their participation in agricultural managed services. Considering that China will continue to be a major country with a massive number of small farmers for a long time, efforts should focus not only on increasing production scale through agricultural managed services but also on ensuring coverage among small farmers. Guiding small farmers to achieve green transformation in agriculture by involving them in agricultural managed services is vital.

5.3 | All-Around Advocacy of the Consumption of Green Agricultural Products

Consumers should be guided to develop a comprehensive understanding of the distinctive role of green agricultural products and foster a heightened demand for such products. This, in turn, will propel the development of a market for green agricultural products and drive the green transformation of agricultural production. To begin with, it is essential to promote the mindset of green transformation among consumers regarding agricultural products. Informative campaigns targeted at the general public shall be conducted, employing diverse formats and engaging in regular publicity and educational initiatives. By enhancing consumers' knowledge and willingness to invest in green agricultural products, it is possible to cultivate a preference for the consumption of green agricultural products. Additionally, the establishment of agricultural products

information service platforms is of great concern. These platforms will facilitate communication between farmers and consumers, establishing trust for information exchange. By improving the price formation mechanism for high-quality agricultural products, it is possible to bolster the growth of the market for green agricultural products. Building upon the foundation of information platforms, it is vital to gradually introduce new features such as shopping advisors and transaction services. This evolution will contribute to the gradual recognition and acceptance of green agricultural products by consumers. The third is to create a favorable atmosphere for sharing and co-governing the consumption of green agricultural products. It is necessary to strengthen the functional roles of consumer associations, environmental protection organizations,

and relevant government departments. News media should be encouraged to conduct rational and proactive monitoring of public opinions, with the aim of advocating for consumers to actively assume social responsibility.

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