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The Demand Upgrade and Optimization Strategies for Rural Socialized Services in Agricultural Modernization

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Abstract: The modernization of agriculture is changing the demand of rural socialized services from basic guarantees to high-quality long-term diversified services, which requires the service system to match the supply structure with both large-scale agricultural production as well as the customized farmer service needs. The existing service supply system is facing many practical problems. Improvement methods should place emphasis on innovating the service model and expanding the use of intellectual tools. Meanwhile, educational improvement can create more training opportunities for the workforce, which can also enhance efficiency of service. The ongoing improvement of rural socialized services ultimately relies on creation of funding models (such as matching investment strategies), and standardizing systems, overall building a reliable and sustainable support systems that can develop alongside the demands of agriculture in the modern era.

1. Introduction

The fundamental characteristics of agricultural modernization are technological penetration and industrial integration, while the socialized service functions of rural areas have expanded from traditional production support to the industrial chain cooperation and information support matters. Demand upgrading theory illustrates that the service content should respond to farmers' deep expectations for knowledge training and market integration, and the integration of educational resources has become a key link to improve service adaptability. The current service system is facing issues, such as inadequate supply-efficiency levels and talent capacity gaps, and it is necessary to explore optimization paths based on farmers' needs, to promote co-development of the service system with agricultural transformation.

2. The Theoretical Foundation of the Demand Upgrade for Rural Socialized Services in Agricultural Modernization

2.1. The Connotation and Characteristics of Agricultural Modernization

The modernization of agriculture involves large-scale management and investment in technical factors. In specific aspects, it relates to rapidly circulating land and promoting mechanization to

increase productive efficiency. The agricultural production model is gradually shifting from the traditional subsistence farming model, and new organizational forms of business, namely professional large-scale farmers and cooperatives, are emerging. The need for technical guidance and market information around agricultural production from these actors is becoming increasingly urgent. The characteristics of modern agriculture also include the expansion of the industrial chain to include little value-added processing and even sometimes extending to managing sales of the final product. This type of expansion means farmers might seek to obtain new services in areas such as brand building and e-commerce management. The transformations brought about by modernization have altered the landscape of agricultural farming, shifting the role of farmers into that of farm operators. They now serve as both growers and developers, as well as decision-makers, overseeing the coordination of pre-cultivation technologies, mechanical operations, and the planning processes for production and marketing.

2.2. The Functions and Evolution of Rural Socialized Services

The original key function of the rural socialized service system was to distribute essential agricultural supplies and lease agricultural machinery, and its development subsequently followed the transition of agricultural production methods and deepened incrementally. Traditional service content mainly includes selling seeds and fertilizers and collaborating on small agricultural machinery. Limited service content has now extended to evaluate field management guidance and develop agricultural marketing/service channels. The service system functions as a bridge in agricultural technology diffusion by connecting research institutions with farmers; it can convert the characteristics and management points of new varieties into usable production plans for farmers. Current service functions are now expanding into financial support and business cultivation, and service providers in some regions are beginning to explore providing small credit guarantees and assistance with geographic indication authentication. Finally, the organization of the service system has transitioned from a focus on a supply and marketing cooperative to a multi subject collaboration network, incorporating professional service companies and farmer cooperatives, ultimately establishing a modern service supply framework.

2.3. Theoretical Framework for Demand Upgrading

The framework of demand upgrading theory is based on Maslow's hierarchy of needs theory, and its core reveals the objective law of the transformation of farmers' needs from survival oriented to development oriented. The process of agricultural modernization has driven significant changes in the demand content of farmers. They have gradually shifted from initially pursuing the supply of production materials such as pesticides and fertilizers to craving field management techniques and market risk avoidance methods. The process of demand upgrading presents a clear hierarchical feature, and when the demand for basic materials is met, farmers naturally have a strong desire for product quality improvement and brand building. The expectations of modern agricultural operators for services have exceeded the traditional scope, and they need to acquire new service projects such as e-commerce operation knowledge and industrial chain integration solutions. The sustained nature of demand upgrading requires the service system to maintain dynamic adjustment capabilities, and it needs to update service content in a timely manner according to the pace of agricultural technology updates and market trends [1].

3. Issues in Rural Socialized Services under the Context of Agricultural Modernization

3.1. The mismatch between service supply and demand structure

The present rural liberalization service supply system continues with an old traditional structure, with service projects settings not corresponding to the modern operational needs of the situation operators, as many service organizations have maintained the previous work model of mainly selling seeds and fertilizer, which makes the timely need of cooperatives to work fully mechanized operations difficult. The content of the service was obviously singular, with a great deal of resources heavily allocated in production but rarely in the product grading packaging and market sales guidance variabilities that farmers desperately need. The supply and allocation of service resources also presented regional imbalance phenomenon. Large scale operating entities in plain areas often have access to mechanical operational services from professionals while smaller farmers in mountainous regions had a very inadequate supply of service. Some service agencies adapted new service delivery to respond to emerging needs from farmers such as drone flight defense and food e-commerce operation training slowly and were not on pace to update their service programs with changes of subsequent practices in agricultural production. The sensitivity of service providers to changes in demand needs to be improved, which leads to a large amount of service resources being invested in traditional areas with saturated demand, while emerging service areas have supply gaps.

3.2. Low level of technological innovation and application

The technological update speed in the field of rural socialized services is significantly lagging behind the needs of agricultural development, and many service organizations still rely mainly on traditional farming experience as their guiding basis. The grassroots service stations of modern agriculture urgently need to popularize intelligent monitoring equipment, and precise management of the crop growth process is difficult to achieve effectively. The promotion and application of new agricultural machinery in small-scale farmers' homes has practical problems, such as complex operation and high maintenance costs. Technical service personnel cannot operate digital instruments, and they often cannot accurately interpret the field data collected by the sensors. The existing technology promotion system performs poorly in solving practical problems, for example, there is often a gap between the diagnosis results of a pest and disease identification system and the actual field situation. The application scope of agricultural Internet of Things technology of field crops is still small, and continuous improvements are needed to ensure the stability and reliability of the related equipment in complicated natural conditions. The use of intelligent irrigation equipment is generally only implemented in demonstration parks while ordinary farmers might have very little chance to have access to the water-saving and fertilizer-saving technologies. The application depth of digital tools in production and sales linkage is generally not very profounding, while links between e-commerce platforms and the actual productions data are not very connected, and they have a direct impact on the efficiency of sales.

3.3. Insufficient capital investment and resource allocation

The total funding supply for the rural socialized service system is significantly insufficient, and many service stations find it difficult to update necessary testing equipment due to funding constraints. The fund allocation structure shows a tendency to prioritize hardware over software, with equipment procurement occupying a large amount of funds and a relatively tight budget for technical training. Grassroots service organizations often face the dilemma of insufficient operating

funds, which directly leads to a reduction in the frequency of field guidance to farmers. There is a regional imbalance in resource allocation, with relatively concentrated service resources in plain areas and significantly insufficient coverage of service outlets in hilly areas. The low investment enthusiasm of social capital in the agricultural service sector and the long return period directly affect the participation of private capital in technical services. Some service projects have problems with idle equipment and duplicate resource investment, and the efficiency of fund utilization needs to be further improved.

3.4. Lack of Service Standards and Regulatory Systems

The construction of a standard system for socialized services in rural areas is still behind in the agricultural modernization process, which is particularly evident in the absence of unified flight altitude and pesticide ratio specifications for unmanned aerial vehicle plant protection services. The absence of this basic standard leads to large disparities in service quality among regions, which makes it difficult for farmers to truly enhance their trust in mechanized services to improve productivity. The regulatory system does not yet cover emerging service areas, including the lack of corresponding qualification review mechanisms for new formats such as agricultural e-commerce live streaming. The service contracts lack a certain level of standardization, which results in disputes over the quality of mechanical services, while an ambiguous definition of responsibilities affects the protection of rights and interests of both service parties. The industry self-discipline mechanism has not yet exerted its power over service quality control, while some service providers practice disorderly competition by lowering standards. The tracking and evaluation mechanism of service effectiveness can be slow to construct, and there are obvious and lingering weak links in the collection of data on crop growth and analysis of benefit after the provision of technical assistance [2].

3.5. Weak professional talent and organizational capabilities

The domain of rural socialized service is facing the practical dilemma of not having enough reserved professional talents, and the phenomenon of agricultural college students flowing into cities still exists. Service organizations find it difficult to recruit composite talents that have agricultural technology and market operation capabilities, which directly affects the service project expansion quality of service organizations. The existing talent team does not update its knowledge structure at the same speed as agricultural technology development, and there are clearly weaknesses in their ability to operate intelligent agricultural equipment. The loss of talents issue is particularly severe in grassroots service stations, and due to the limitations of salary and space for development, young employees have a hard time living in rural places for a long time. The age structure of the grassroots service team is unbalanced, and the ratio of middle-aged employees and elderly employees is high, resulting in an acceptance of new technology being slower. The professional training system for service personnel is not yet perfect, and the professional training system for service personnel to meet personalized needs for the new agricultural management entity.

4. Optimization Strategies for Rural Socialized Services

4.1. Service Model Innovation and Diversified Development

Service organizations must expand the boundaries of the traditional single-service mode and extend their scope from production-stage services to supplementary pre-production and

post-production services, thus establishing a service ability covering the entire industrial chain. They can formulate integrated service solutions covering seed selection, field management, and product marketing. Service organizations will be able to provide smallholder farmers with a service for land management while developing individualized technical guidance for family farms. Innovations of services will need extra attention to adding value to agricultural products. In this regard, it will be a priority for the professional teams to assist farmers to use values added processes, such as product grading, packaging and brand marketing for their products. For example, they could formulate exclusive packaging for specialty agricultural products or widen e-commerce sales channels. Special importance will be needed for linking service providers with similar offerings as agricultural machine cooperate and agricultural extension engineering will work together to develop regional comprehensive service platforms that achieve multiple advantages from technical and equipment resources [3].

The collaborative management of service resources can result in significant improvements in utilization efficiency. Multiple service organizations can collaboratively establish shared agricultural machinery service stations that allow for large-scale equipment to be utilized over a wider area. The development of a regional specialty service model should build upon the existing industrial base and be adaptable to the production conditions of the area. In plains grain-producing areas, this would involve completely mechanized services, while in mountainous and hilly areas it would involve specially designed technical guidance services along with cold chain logistics services. The delivery of services must fully utilize modern information technology, especially the use of a digital service platform to integrate technical consultation, market information, and the possibility of training services, to respond quickly to farmers' new needs as they arise during different agricultural production processes. The multiplicity of service models must also recognize that different operating entities will have different needs. Cooperatives will want services that lead to integrated supply chain services, while small-scale farmers are often driven by a desire to control production costs. The variations in needs imply that service providers will need enough flexibility and adaptability in providing services.

4.2. Technological Integration and Intelligent Enhancement

When integrating technology, the emphasis should be on lightweight and simplified equipment designed for smallholder producers, for example, designing irrigation controllers, or pest identification options based on mobile clients. Service providers could also roll out modular tech-based solutions that package compatible soil monitoring sensors together with smart irrigation and create service that can be tailored for specific products or crops. Data integration and application would imply developing a unified information management platform that collates multi-source data (weather forecasts, market trends etc.) gathered or generated to assist with production decisions. At the heart of technology integration is facilitating information flow so that data collected in fields can be timely translated into production advice that can be understood and acted upon by farmers.

Improving the level of intelligence requires gradually promoting the upgrading of equipment, and require equipping existing agricultural machinery with navigation terminals in order to achieve accurate work. Smart device selection should take into full account rural power grid and network coverage conditions, and give priority to promoting practical model devices with the lowest energy demand and ease of maintenance. Service personnel must master the basic operating skills for smart devices, as well as guide farmers in using mobile applications capable of receiving monitoring data. Cost control of intelligent services is paramount, while looking into equipment leasing and sharing use models can help in lowering the threshold of initial investment for farmers. Feedback

mechanisms for continuous optimization of intelligent technology are also needed, and creating mechanisms for farmers to evaluate services is a way to encourage continuous improvement and perfection of the technical service [4].

4.3. Fund Guarantee and Optimization of Investment and Financing Mechanisms

Financial investment should clarify the main directions in support and allocate funds to weak links and key areas of the service trajectory. At all levels of government, a platform for the integration and utilization of funds should be created, and planning and scheduling of agricultural service funds spread across departments should be unified. The allocation of funds should reflect differentiation and give appropriate preferential treatment to hilly and mountainous areas and areas where smallholders are concentrated. A long-term stable fiscal investment mechanism may help ensure service network continuous operation and avoid fluctuations of funds' impact on the quality of service supply. The evaluation mechanism of funds' utilization efficiency should be further improved; and a performance evaluation system guided by service effectiveness should be established.

Service organizations should prioritize sustainable improvements in operational capacity and credit levels and standardize financial management to obtain credit support from financial institutions. Innovation in investment and financing mechanisms can explore various paths to implementation, including separate agricultural service industry investment funds as well as innovating credit collateral types. The involvement of social capital in the construction of the service system requires supportive policy orientation, and appropriate financial subsidies and risk compensation can greatly enhance the attractiveness of investment. Collaborative, co-construction relationships among service providers can assist in reducing the costs of investment. Multiple service organizations can jointly invest in establishing shared service infrastructure and facilities. Designing sustainable business models can enhance self-generating functions of projects to gradually limit over-dependence on financial funds.

4.4. Service Standardization and Branding Development

Establishing service standardization needs to begin with the passage of unified technical specifications to clarify quality requirements in key links of production, such as agricultural machinery operation and pest control. An industry organization may take responsibility to develop service process standards at a regional level including specified indicators such as equipment configuration parameters and service response time limits. The implementation process of standards should include a supporting supervision mechanism and designate a third-party evaluation organization to provide regular assessments of service effectiveness. Training service personnel on operational norms should specify a system to ensure that standards do not drift or devolve in any implementation process. The establishment of criteria for service quality evaluations must include some sort of feedback interface with farmers, where satisfaction of user experience is an important leverage in implementing measurement standards.

Brand building should rely on local characteristic agricultural industries to create recognizable service trademarks and visual images. The service provider must establish brand management standards, standardize the identification signage at service windows, and standardize the dress code for employees. At the heart of brand services, it is important to establish consistent quality commitments, such as establishing bottom-line standards for operational efficiencies or enhanced production results. Brands can use modern agricultural demonstration parks or different venues to enhance farmers' confidence in brand services through on-site observation. The brand services value proposition will continue to enhance value through the accumulation of ongoing success stories or

results, in turn creating a word-of-mouth effect to create more awareness of standardized services [5].

4.5. Talent cultivation and team building

The system of talent cultivation suggests the establishment of a multi-level training network, with agricultural colleges developing professional classes aligned to modern agricultural services. The design of training content should emphasize theory and practice, and promote more practical skills training (eg smart agricultural equipment use; operation and management of market processes). It will also be necessary to establish a normalized mechanism for knowledge update of current service personnel, and regularly engage them to participate in seminars on new technologies and classes aimed at improving business capacity. Training modes can be adaptable and diversified while field-based practical training and online course learning offer opportunities to respond to the time requirements of different students. The vocational qualification certification system should also be better aligned, clarifying the entry thresholds for technical service roles and the promotion criteria.

The talent introduction policy should offer practical and effective guarantee measures, as well as appropriate subsidies and career development space to attract agricultural graduates to return home for employment. Service organizations should improve their internal talent development system and establish a mentoring pairing system to help young employees accelerate their professional growth. The incentive measures for talents should reflect fairness and ensure that remuneration and benefits are directly related to service quality and farmer evaluation. Working conditions for rural grassroots personnel should continue to be improved, and ensure that personnel have the necessary technical equipment and living facilities to continuously promote more attractive job conditions. The application of a talent mobility mechanism should retain moderate mobility flexibility and encourage service personnel to share lived experiences by moving between different types of organizations. The stability building of the talent team should ensure that there is focus on cultivating professional identity and enhancing occupational value recognition by practitioners of rural service work.

5. Conclusion

The optimization strategies for rural socialized services need to rely on the dual drive of technological innovation and talent cultivation. The construction of standardized services can enhance farmers' trust in professional support. Continuous empowerment of education helps narrow the gap between service supply and modernization demand, and optimizing funding allocation provides a stable foundation for long-term service upgrading. The reconstruction of the service system under the background of agricultural modernization should focus on effectiveness and inclusiveness, gradually forming a virtuous cycle mechanism that is in line with the pace of rural development.

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