Research on the Pathways of Agricultural Production Trusteeship Services in Liangshan Prefecture to Facilitate Smallholder Farmers' Income Increase

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Abstract. Agricultural production trusteeship is an important pathway to address the challenges of "who will farm the land" and "how to farm it well," as well as to achieve the organic connection between smallholder farmers and modern agriculture. Taking Liangshan Prefecture in Sichuan Province as the research object, this paper systematically analyzes the internal mechanisms and practical models of agricultural production trusteeship services in facilitating smallholder farmers' income increase. The findings reveal that agricultural production trusteeship services in Liangshan Prefecture have developed typical models, including "full-process trusteeship + menu-based customization" "tripartite joint operation" and "contract farming + trusteeship" These models promote smallholder farmers' income increase through mechanisms such as cost reduction and efficiency enhancement, labor liberation, and technology embedding. However, current challenges include insufficient capacity of service providers, limited willingness of smallholder farmers to participate, constraints posed by mountainous conditions, and a lack of policy precision. Accordingly, this paper proposes countermeasures and recommendations, including cultivating diversified service providers, innovating trusteeship service models, strengthening targeted policy supply, and improving benefit linkage mechanisms, to provide references for the development of agricultural production trusteeship and the promotion of smallholder farmers'income increase in Liangshan Prefecture and similar ethnic minority regions.

Keywords: Agricultural production trusteeship; smallholder farmers'income increase; Liangshan Prefecture; agricultural socialized services

1 Introduction

With the rapid advancement of urbanization, a large number of young and middle-aged rural laborers have migrated to cities, making the problems of "who will farm the land" and "how to farm it well" increasingly prominent. The report of the 20th National Congress of the Communist Party of China proposed the development of new agricultural business entities and socialized services to promote appropriate-scale agri-

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A. Bhattacharjya et al. (eds.), *Proceedings of the 2026 4th International Conference on Management Innovation and Economy Development (MIED 2026)*, Advances in Economics, Business and Management Research 405,
https://doi.org/10.2991/978-94-6239-787-3_47

cultural operations. Against this backdrop, agricultural production trusteeship, as an important initiative to innovate agricultural business models, has experienced rapid development. Liangshan Yi Autonomous Prefecture is a typical ethnic minority settlement area and a formerly deeply impoverished region. With over 90% of the prefecture's area being mountainous, fragmented farmland, severe labor outmigration, and low efficiency of traditional farming, the prefecture faces significant agricultural challenges. In recent years, localities such as Huidong County, Leibo County, Ningnan County, and Butuo County have actively explored agricultural production trusteeship and developed distinctive practical models that have effectively facilitated income growth for smallholder farmers. However, overall, agricultural production trusteeship in Liangshan Prefecture remains in its initial stage, with limited service coverage. Therefore, this paper systematically analyzes the mechanisms and challenges of agricultural production trusteeship in facilitating smallholder farmers' income growth and proposes optimization pathways, aiming to provide a reference for Liangshan Prefecture and similar ethnic minority regions.

2 Theoretical Mechanisms of Agricultural Production Trusteeship in Facilitating Smallholder Farmers' Income Increase

Agricultural production trusteeship refers to an operational mode in which farmers entrust some or all of the farming stages—such as plowing, sowing, plant protection, and harvesting—to specialized service organizations without transferring the land management rights. Internationally, this is referred to as agricultural outsourcing, and it is recognized that this model addresses the deficiencies of farmers in terms of information, skills, labor, and equipment[1].

2.1 Cost Reduction and Efficiency Enhancement Mechanism

Agricultural production trusteeship achieves cost reduction and efficiency enhancement through large-scale services, representing the core mechanism for increasing smallholder farmers' income. Li et al. constructed a theoretical framework of "agricultural production trusteeship—factor substitution—smallholder farmers' income." Based on data from 2,060 grain farmers across 44 counties in 11 provinces, their study found that trusteeship services promote grain farmers'income increase through two dimensions: labor division and material capital allocation. Trusteeship of labor-intensive links primarily increases income by optimizing labor division, while technology-intensive links mainly promote income growth by optimizing material capital allocation[2].

2.2 Labor Liberation Mechanism

Agricultural production trusteeship frees smallholder farmers from heavy farming labor, enabling them to confidently seek off-farm employment or engage in

non-agricultural business activities, thereby achieving dual income from "employment and dividends." Based on data from China's Rural Revitalization Survey, Zhao et al. demonstrated that trusteeship services increase farmers'income levels primarily by improving crop yields, reducing production costs, expanding operation scales, and promoting off-farm employment transfers, with a particularly significant promoting effect on smallholder farmers'common prosperity[3]. Kumar et al. also pointed out that agricultural production outsourcing helps address labor problems and improves the efficiency of crop cultivation[4]. For the elderly and women remaining in rural areas, trusteeship services solve the problems of being "unable to farm effectively" or "unable to farm well."

2.3 Technology Embedding Mechanism

Agricultural production trusteeship serves as an important vehicle for introducing modern production factors into smallholder farming. Through unified technical training and field guidance, service organizations transmit advanced technologies—including improved varieties, better cultivation methods, and modern machinery—to smallholder farmers. Related research indicates that outsourcing is more conducive to achieving higher levels of green technology inputs than self-directed investment and can generate higher profits for small-scale farmers[5].

2.4 Industrial Chain Extension Mechanism

Agricultural production trusteeship is not limited to mid-production stages but extends to pre-production agricultural input supply and post-production drying, storage, and marketing connections, embedding smallholder farmers into the modern agricultural industrial chain. Based on a Stackelberg game model, Ye et al. found that when cost-benefit ratios are favorable, trusteeship services increase farmers' profits, with "full-time" trusteeship having a more significant effect on farmers[6]. By extending the service chain, smallholder farmers not only gain benefits from the production stage but also share in the value-added benefits from processing and distribution stages.

3 Practical Models of Agricultural Production Trusteeship in Liangshan Prefecture to Facilitate Smallholder Farmers' Income Increase

3.1 The "Full-Process Trusteeship + Menu-Based Customization" Model

This model is exemplified by Huidong County. Huidong County is a major agricultural county with 882,000 mu of cultivated land. The county has vigorously cultivated diverse service providers, including socialized service companies and professional agricultural machinery cooperatives, and implemented the "full-process trusteeship + menu-based customized service" model, providing farmers with one-stop, full-chain

agricultural services, including land preparation, sowing, scientific fertilization, UAV green plant protection, and mechanical harvesting. Farmers can choose full-process trusteeship or single- or multi-link services according to their needs.

3.2 The "Smallholder Farmers + Village Collective + Cooperative" Tripartite Joint Operation Model

This model is exemplified by Wenshui Village in Leibo County. Wenshui Village has two centralized resettlement sites for poverty alleviation relocation, accommodating 1,127 people from 260 households. To address the challenge of ensuring that relocated residents settle down steadily and become prosperous, the village adopted a model of "entrusted operation by professional company + 100% village collective property rights" and established a 400-mu high-mountain asparagus planting base. Villagers receive rental income through land transfer, wage income from working at the base, and village collective dividends.

3.3 The "Party Building + Cooperative + Base + Farmers + Contract Farming" Model

This model is exemplified by Shili Town in Ningnan County. Utilizing the village collective economy, Datian Village in Shili Town established a demonstration base of over 100 mu for high-mountain organic autumn pumpkin, implementing the industrialization development model of "Party building + cooperative + base + farmers + contract farming." Leveraging the locational advantage of the Yibin-Panzhihua Expressway exit and the agricultural product warehousing and logistics center under construction, the village has achieved a virtuous cycle of "having orders before planting, receiving services during planting, and having markets after harvest." .

3.4 The "Park + Company + Farmers Trusteeship Employment" Model

This model is exemplified by Buer Township in Butuo County. Liangshan Yaoxijun Agricultural Technology Co., Ltd. has developed a 432-mu high-mountain vegetable modern agricultural park in Buer Township, equipped with a 500-square-meter cold storage and 2,000 square meters of sorting, packaging, and logistics areas. The park's workers, dispatched by third-party labor service companies, are almost all nearby villagers. During peak harvest seasons, villagers earn 3,000-4,000 yuan per month, achieving both income generation and family care.

4 Practical Challenges of Agricultural Production Trusteeship in Liangshan Prefecture in Facilitating Smallholder Farmers'Income Increase

4.1 Insufficient Capacity of Service Providers

Agricultural socialized service organizations in Liangshan Prefecture started relatively late and generally face problems of small scale, weak capacity, and poor equipment. Currently, the prefecture's service organizations are dominated by small-scale agricultural machinery cooperatives, lacking large-scale service providers capable of full industrial chain services. Service content is mostly concentrated on mechanized stages such as plowing, sowing, and harvesting, with insufficient capacity for value-added services including variety selection, water and fertilizer management, green pest and disease control, and post-harvest drying and marketing. Furthermore, shortages of professional machinery operators and agricultural technicians are prominent, constraining the quality of service delivery.

4.2 Limited Willingness of Smallholder Farmers to Participate

Influenced by traditional attitudes, some smallholder farmers harbor cognitive biases and trust deficits regarding trusteeship services. Some elderly farmers, accustomed to "farming their own land themselves," worry about losing control over their land after trusteeship. At the same time, the generally small operation scales and scattered land parcels of smallholder farmers in Liangshan Prefecture result in high unit operation costs for service organizations, making service prices less attractive to smallholder farmers. Some farmers report that while trusteeship services save effort, they are more expensive, and thus prefer to complete some operational stages themselves.

4.3 Constraints of Mountainous Conditions on Service Supply

Liangshan Prefecture has a high proportion of mountainous areas and severe land fragmentation, making mechanized farming difficult. Large agricultural machinery faces prominent problems of being "unable to enter," "unable to turn," and "unable to operate effectively" in mountainous areas. UAV plant protection also faces operational risks due to strong mountain winds and irregular field plots. These natural conditions constrain the large-scale supply of trusteeship services, increase service costs, and reduce service efficiency. Compared with plains areas, developing agricultural production trusteeship in Liangshan Prefecture faces higher technical thresholds and cost constraints.

4.4 Lack of Policy Precision

Although central and provincial governments have introduced funding support policies for agricultural socialized service projects, their implementation in Liangshan Prefec-

ture suffers from a "lack of local adaptability." Some policies are implemented according to uniform standards without adequately considering the particularities and differences of ethnic minority regions. For example, the subsidy standards for service stages under project funds diverge from actual costs; project application procedures are complex, making it difficult for small-scale service organizations to meet eligibility thresholds; and policy dissemination is inadequate, leaving many smallholder farmers unaware of or unable to utilize trusteeship subsidy policies.

5 Optimization Pathways for Agricultural Production Trusteeship in Liangshan Prefecture to Facilitate Smallholder Farmers' Income Increase

5.1 Cultivate and Strengthen Service Providers to Enhance Trusteeship Service Capacity

First, we should vigorously cultivate local agricultural production trusteeship service organizations. Supported by funds, technical training and equipment upgrading, existing machinery cooperatives, supply and marketing cooperatives and agricultural enterprises can be developed into capable benchmark service providers with extensive coverage. Second, high-quality external agricultural entities are introduced to launch cross-regional trusteeship services in Liangshan, which can fuel the growth of local service groups. Third, vocational schools and agricultural technology promotion agencies will provide professional training on farm machinery operation, drone plant protection and agricultural e-commerce, cultivating a team of skilled practitioners devoted to rural agriculture.

5.2 Innovate Trusteeship Service Models to Enhance Service Adaptability

In light of Liangshan's mountainous terrain and farmers' diverse demands, customized trusteeship models shall be developed. Full mechanized trusteeship is suitable for flat and gentle lands, while partial-link services fit scattered mountain plots. We will explore three integrated modes: trusteeship plus contract farming linking farmers with processors and markets to avoid unsold harvests, trusteeship plus e-commerce expanding sales of local specialties via live streaming and group buying, and trusteeship plus exclusive agricultural insurance to mitigate natural and market risks for smallholders.

5.3 Strengthen Targeted Policy Supply to Reduce Trusteeship Service Costs

To improve policy support for Liangshan, four measures are proposed. First, optimize fiscal subsidies by offering ethnic-region preferential policies, raising subsidies for core farming links and simplifying application formalities. Second, launch low-interest

trusteeship loans for service providers to buy farm machines and build supporting infrastructure. Third, expand agricultural insurance to cover trusteeship and design performance insurance to safeguard farmers' interests. Fourth, promote relevant policies in Chinese and Yi through village broadcasts, night schools and courtyard meetings to raise farmers' recognition.

5.4 Improve Benefit Linkage Mechanisms to Ensure Smallholder Farmers Share in Benefits

First, optimize income distribution and encourage win-win sharing modes such as guaranteed minimum income plus stock dividends, allowing farmers to access more value-added profits brought by agricultural trusteeship. Second, widely apply the official standard service contract issued by the Ministry of Agriculture and Rural Affairs, clearly defining service scope, charging standards, profit allocation and breach liabilities to safeguard legitimate rights of all participants. Third, township and village authorities organize farmers to evaluate service quality and contract fulfillment. Evaluation results will be associated with policy subsidies, forming a sound market environment where outstanding service providers thrive and unqualified ones exit.

6 Conclusion

Taking Liangshan Yi Autonomous Prefecture of Sichuan Province, a typical mountainous ethnic minority region that was once mired in deep poverty, as the research object, this paper probes into the mechanisms through which agricultural production trusteeship facilitates income growth among smallholder farmers. It systematically sorts out four income-increasing mechanisms, summarizes four localized practical models, identifies four prominent constraints, and proposes corresponding optimization countermeasures. This research provides theoretical references and practical insights for advancing agricultural socialized services and consolidating income-increasing channels for smallholder farmers in Liangshan and other analogous mountainous ethnic minority regions.

References

1. Reardon T, Awokuse T, Belton B, et al. Emerging outsource agricultural services enable farmer adaptation in agrifood value chains: A product cycle perspective [J]. Food Policy, 2024, 127 102711-102711. DOI:10.1016/J.FOODPOL.2024.102711.
2. Li Y J, Tang W H, Ma J. Mechanism of agricultural production trusteeship affecting farmer's household income and its link heterogeneity[J]. Journal of China Agricultural University, 2024, 29(8): 300-313.
3. Zhao L, Shi J, Xue F, et al. Can agricultural production trusteeship help farmers' common prosperity? Based on the research view of family income and happiness[J]. Journal of Technology Economics, 2024, 43(7): 28-39.

4. Kumar R N, Athare G P, Kumar A, et al. Impact of Custom Hiring Services on Paddy Cultivation: A Propensity Score Matching Approach [J]. Agricultural Research, 2026, (prepublish): 1-8. DOI:10.1007/S40003-025-00933-9.
5. Green technology outsourcing for agricultural supply chains with government subsidies[J]. Journal of Cleaner Production, 2024, 436: 140674.
6. Ye C, Sun Z L, Wang Z P, et al. Study on participation strategy of land trusteeship considering agricultural marketing services[J]. Systems Engineering - Theory & Practice, 2025, 45(1): 160-175.

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