Proceedings of CONF-BPS 2026 Symposium: Innovation, Finance, and Governance for Sustainable Global Growth
DOI: 10.54254/2754-1169/2026.BJ32325

Research on the Mechanism of Farmers' Insufficient Cultivation Intention-A Case Study of Huangtan Village in Pingchang County, Sichuan Province

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Abstract. China faces a severe issue of abandoned farmland, affecting 107 counties across 21 provinces and municipalities. In Sichuan Province, for example, the abandoned land rate in contracted farmland reached 2.2% in 2022, ranking among the highest nationwide and directly threatening food security. Using Huangtan Village in Pingchang County as a case study, field research conducted among 10 farming households revealed that all surveyed farmers were unwilling to farm, with 7 expressing willingness to sell their land. Analysis identified four core reasons for low farming motivation: (1) meager farming income (including subsidies) barely covering costs, significantly lower than migrant workers' earnings; (2) fragmented farmland, lack of field roads, and inadequate irrigation facilities hindering large-scale cultivation and agricultural machinery operations; (3) low agricultural subsidy standards and policies lacking long-term transparency, with some regions experiencing discontinuous agricultural planning due to leadership changes; and (4) aging rural labor forces struggling to sustain high-intensity farming. To address this, targeted countermeasures are proposed: improving agricultural economic efficiency, optimizing grain procurement and subsidy mechanisms, strengthening agricultural infrastructure, stabilizing agricultural policies, and promoting land circulation and agricultural technology dissemination to boost farmers' enthusiasm for farming and alleviate abandoned farmland issues.

Keywords: Farmers' planting intention, fallow land, planting strategies, agricultural policies, land management conditions

1. Introduction

The scope of abandoned farmland in China is relatively extensive, mainly involving 107 counties across 21 provinces and municipalities. Taking Sichuan as an example, the total area planted with food crops in 2022 reached 96.952 million mu across 20 cities (prefectures) and 176 counties (excluding Panzhihua City). Of this, 2.176 million mu of contracted farmland was left uncultivated, accounting for 2.2% of the total arable land area [1]. Additionally, during the 2023 Spring Festival, an online survey jointly conducted by Weibo and the China Rural Governance Research Center of Wuhan University reflected the prominence of farmland abandonment from the perspective of rural

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residents. Among 57,334 respondentss whose hometowns were rural areas, reports covered more than 50,000 villages nationwide. Of the 2,692 respondents from Sichuan Province, 26.1% believed that their region had a relatively high proportion of abandoned farmland, ranking second nationwide [2]. Although online surveys have limitations in terms of statistical representativeness, the findings nevertheless reflect widespread public concern about the issue. From a practical standpoint, farmland abandonment reduces grain cultivation areas and weakens agricultural productivity in the short term. Over the long term, it may lead to soil degradation and a decline in farming capacity, thereby posing risks to food security and sustainable agricultural development. Such trends undermine stable grain production and contradicting President Xi Jinping's directive to hold our own food bowl [3].

Based on this, this paper analyzes the factors influencing farmers 'willingness to cultivate land in Huangtan Village, Pingchang County, Bazhong City, Sichuan Province, through field investigation and other scholars' research results.

2. Methods

This study focuses on Huangtan Village in Pingchang County, Bazhong City, Sichuan Province. As a key agricultural hub in the county with abundant arable land, the village exhibits typical characteristics of rural areas in northeastern Sichuan, including farming practices, household scale, and policy benefits. These features make it a suitable case for examining farmland management and farmers' cultivation decisions at the micro level. A case study approach was adopted, combining questionnaire surveys and semi-structured interviews. Three households completed structured questionnaires designed to collect systematic information on farmland scale, crop structure, agricultural input expenditures, subsidy receipt, planting income, and cultivation intentions. The questionnaire covered four dimensions: basic farmland management, agricultural input-output conditions, awareness and utilization of agricultural policies, and land disposal preferences. In addition, semi-structured interviews were conducted with seven households to explore practical farming challenges, perceptions of agricultural policies, views on land transfer or sale, and reasons for discontinuing farming. These interviews supplemented the questionnaire data and provided qualitative insights into farmers' decision-making processes.

The three questionnaire households cultivated 11.5 mu, 10 mu, and 15.6 mu of land respectively, (of which 7.6 mu were self-owned and the reminder leased). The main crops included rice, corn, and rapeseed. Average agricultural input cost were about 350 yuan per mu. All households owned small-scale machinery such as seeders and received two types of subsidies: the Farmland Fertility Protection Policy and the One-time Subsidy for Grain Producers. The 10-mu household primarily produced crops for self-consumption rather than market sale. Across all surveyed households, farmers expressed reluctance to continue farming. Among them, three questionnaire respondents and four interviewees indicated a willingness to transfer or sell their land.

The analysis combines quantitative and qualitative approaches. First, quantitative data from the questionnaires—including cultivated area, input costs, and subsidy utilization—were organized and analyzed using descriptive statistics. Interview transcripts were coded to identify recurring themes related to low farming motivation and land transfer intentions. By triangulating quantitative and qualitative evidence, the study aims to provide a comprehensive understanding of the factors contributing to farmland abandonment at the village level.

This study has several limitations: First, the small sample size and focus on a single village limit the generalizability of the findings. Second, interview data may be influenced by subjective expressions and interaction dynamics. Third, the analysis primarily concentrates on individual

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households and does not systematically incorporate broader structural factors such as regional agricultural industrial patterns, land transfer market development, and demographic shifts in rural labor force. These aspects warrant further exploration in future studies.

3. Determinants of farmers' low willingness to farm

Field investigation in Huangtan Village, combined with relevant literature, indicates that farmers' low willingness to engage in cultivation stems from multiple interrelated factors.

3.1. Insufficient agricultural returns

Among the three surveyed households, agricultural income, including subsidies, barely covers production costs. For example, a farmer with 7.8 mu spends 350 yuan per mu on agricultural inputs (2,500 yuan in total), 350 yuan on primary processing, and 1,050 yuan on harvesting, bringing their annual costs to 3,900 yuan. However, their annual sales revenue amounts to 3,150 yuan, plus 800 yuan in subsidies, totaling 3,950 yuan—barely covering expenses.

By contrast, migrant workers in Sichuan Province earned an average monthly income of 4,042 yuan during the same period, far exceeding agricultural returns [4]. In Heilongjiang Province, although the average household manages 102 mu, annual per capita income stands at 20,400 yuan, whereas service or construction workers earn around 3,000 yuan per month, or 36,000 yuan annually [5].

This significant income disparity substantially diminishs farmers' willingness to engage in farming. The report reveals that in Bin County, over 60% of villagers consider crop yield the most influential factor, while 55% cite net income as the top priority [6]. Thus, income remains a pivotal determinant of farmers' agricultural engagement.

3.2. Fragmented land and inadequate infrastructure

Land fragmentation and weak infrastructure constitute major strcutural constraints. The survey found that farmland in Huangtan Village is highly scattered, reducing operational efficiently and limiting mechanization and scale expansion. Data from fixed observation points in rural areas nationwide show that in 2003, the average land management scale of Chinese households was about 7.5 mu, divided into 5.7 plots, with each plot averaging only 1.3 mu, indicating the severity of the issue [7].

In addition, the lack of field roads hinder transportation and increase labor costs. Irrigation facilities are also inadequate; several ponds remain in disrepair, constraining productivity and increasing agricultural risk. These structural limitations reduce the feasibility of large-scale and mechanized farming, thereby discouraging continued cultivation.

3.3. Limited effectiveness of agricultural subsidies

The intensity and stability of agricultural support policies are insufficient to generate strong incentives. In Huangtan Village, farmers generally perceive the economic benefits of farmland fertility protection policies and one-time grain subsidies as limited. The largest farming household, cultivating 11.5 mu, receives a combined annual subsidy of only 980 yuan, which covers only a small share of production costs.

Evidence from Bin County reveals that although 72.1% of respondents acknowledge that subsidies and guidance policies enhance farming enthusiasm, many consider them insufficient in

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magnitude [6]. This suggests structural weaknesses in the subsidy system. Despite gradual increases in subsidy amounts, they have not kept pace with rising input costs, reducing their real incentive effect.

Research by China Agricultural University in Jiangxi Province identifies two broader problems: first, agricultural subsidies lack long-term strategic orientation and are often embedded within short-term macroeconomic adjustments; second, subsidy mechanisms are fragmented and insufficiently standardized, limiting policy effectiveness [8]. Implementation challenges further weaken policy impact. Low educational levels among farmers, limited policy promotion by village cadres, weak supervision mechanisms, and insufficient transparency in subsidy distribution all reduce effectiveness [9]. In some cases, information asymmetry allows machinery sellers to obscure pricing details, preventing farmers from fully understanding subsidy benefits [8]. Frequent changes in local leadership in Pingchang County have also led to continuous alterations in agricultural planning, undermining policy consistency.

3.4. Aging rural labor force

Population aging further constrains agricultural production capacity. Most farmers in the village are elderly and lack the physical capacity to sustain labor-intensive farming. Many households report insufficient energy to manage larger plots of land. While this issue is related to the outflow of rural labor and, to some extent, is not linked to individual enthusiasm for farming. Therefore, this article will not delve into this topic further.

4. Countermeasures to enhance farmers' willingness to cultivate

4.1. Enhancement of agricultural economic returns

Farmers' willingness to engage in farming can only be ensured if their income increases. Stable and predictable returns from crop production are essential for long-term participation in agricultural activities.

First, agricultural income must have sufficient growth potential. If income growth is too modest or declines, farmers' enthusiasm for farming will be significantly weakened. Appropriately raising grain procurement prices can attract more land resources to grain production, thereby safeguarding farmers' interests while maintaining national food security. In implementing such policies, market principles should be respected to ensure that farmers' rights are protected without disrupting market order or social equity.

Agricultural subsidies constitute a vital component of China's agricultural policy system and function as a market-based mechanism to support farmers' income [10]. However, current subsidy levels fail to address the escalating cost pressures faced by farmers, leaving them vulnerable to operational difficulties and income erosion. The government should therefore adjust subsidy standards dynamically in accordance with changing input costs and increase fiscal support where necessary. Simultaneously, the subsidy structure should be optimized to avoid excessive concentration on large agricultural enterprises. Differentiated policies targeting smallholder farmers and specialty agriculture should be explored to better accommodate diverse production needs.

In addition, without creating excessive intervention in the grain market, the minimum purchase price may be moderately increased. Farmers should also be guided to participate in industrialized operation of agriculture, promote the integration of primary, secondary, and tertiary industries,

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extend the agricultural value chain, and expand employment channels in order to enhance overall agricultural income.

4.2. Improvement and stabilization of agricultural policies

First, efforts should focus on strengthening rural circulation networks by improving road infrastructure, logistics systems, and information networks to enhance agricultural product distribution efficiency and rural informatization. A well-developed circulation network not only facilitates market access for agricultural products but also enables farmers to obtain timely information on market trends, policy updates, and agricultural technologies, thereby reducing risks associated with information asymmetry. The development of such networks directly impact farmers 'interests and overall rural development. China may also draw lessons from international experience. For instance, U.S. agricultural policy features comprehensive legal frameworks. Although China's agricultural policies strictly adhere to legal implementation, the overall system remains incomplete. The U.S. emphasizes market-based regulation to alleviate fiscal burdens of agricultural subsidies, while effectively increasing subsidy amounts [11].

Meanwhile, oversight of agricultural subsidies and the agricultural inputs market should be strengthened. By refining regulatory frameworks and ensuring accountability, business practices in the agricultural supplies sector can be standardized, thereby preventing abnormal price fluctuations that harm farmers' interests. Operators should also receive training on legal compliance and market rules to ensure lawful operations and the provision of qualified agricultural inputs.

Policy stability and continuity are equally crucial. In some regions, frequent adjustments results from leadership changes have weakened farmers' confidence in long-term agricultural development. Maintaining relatively stable policy objectives and implementation mechanisms can provide clearer expectations, reduce uncertainty, and encourage sustainable agricultural engagement.

4.3. Optimization of land use and technological adoption

Promoting land transfer and moderate-scale management is essential for improving agricultural efficiency. Land circulation can relieve farmers from traditional farming practices, enabling them to devote more time and energy to other industries, thereby increasing their income. It also facilitates the dissemination and application of agricultural technologies, enhances technological standards, and support agricultural production [12].

Strengthening agricultural infrastructure—including water conservancy facilities, roads, bridges, and communication systems—is another critical measure. Improved infrastructure enhances resilience against droughts, floods, and other natural disasters, thereby reducing production risks.

Furthermore, greater efforts should be intensified to promote high-quality crop varieties and advanced agricultural technologies. Superior seed varieties play a pivotal role in boosting crop yields; however, the current seed market faces challenges such as excessive variety proliferation and quality differentiation difficulties, complicating farmers' choices. Regulatory authorities should therefore strengthen market supervision to ensure the availability of high-yielding, high-quality, and disease-resistant varieties tailored to farmers' needs. Simultaneously, agricultural extension services should increase investments in farmer training and education to enhance their ability to select suitable varieties and adopt advanced farming techniques. Comprehensive support across the entire process—from seed selection to planting—is essential for achieving sustainable agricultural development.

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5. Conclusion

This study examines Huangtan Village in Pingchang County, Sichuan Province, and analyzes the reasons behind farmers' low willingness to cultivate through field interviews with 10 households and a review of relevant literature. The findings reveal that farmers' low enthusiasm results from multiple factors. First, the significant income gap between farming and migrant labor, where earnings barely cover production costs, directly undermines motivation; Second fragmented farmland, missing field roads, and inadequate irrigation facilities hinder agricultural efficiency and scaled operations; Third, low agricultural subsidy standards, incomplete policy frameworks, and discontinuous agricultural planning in some regions due to leadership changes further weaken farmers 'confidence; Finally, the aging rural labor force, whose physical capacity is insufficient to sustain large-scale farming, exacerbates the decline in planting willingness. Overall, farmers' low willingness to cultivate reflects the combined effects of economic returns, production conditions, policy environment, and labor structure, and therefore requires comprehensive, multi-dimensional measures for effective improvement.

This study has certain limitations. The small sample size and narrow research scope make it difficult to reflect the broader regional patterns of farmers' planting intentions. The causal analysis does not sufficiently incorporate additional influencing factors such as agricultural product market circulation and the availability of technical support services. Additionally, some reference data and literature require improved timeliness. Future research could expand the survey coverage, increase the sample size, and conduct cross-regional comparative studies to further explore the practical effects of agricultural industrialization, digital agricultural technologies, and policy combinations on enhancing farmers' planting intentions. This would provide more precise decision-making references for stabilizing farmland utilization and ensuring food security.

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DOI: 10.54254/2754-1169/2026.BJ32325

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