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Research on Fiscal and Financial Support for the Improvement of Daqing Saline-Alkali Lands and the Enhancement of Grain Production Capacity

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Abstract: The 2025 Central Rural Work Conference emphasized stabilizing grain and oil production, intensifying efforts to implement a new round of the 50-million-ton grain production capacity enhancement initiative, and promoting the optimization of grain varieties and quality improvement. As Chinese largest grain-producing province, Heilongjiang Province must shoulder its responsibility courageously in implementing this strategy. In executing the grain production capacity enhancement strategy, Daqing City primary objective is to actively improve saline-alkali land and optimize cultivated land resources. To ensure adequate and sustained financial support for cultivated land quality improvement, it is essential to diversify funding sources, innovate financial support mechanisms, and secure greater policy-backed green credit and carbon sink-backed investments-thereby contributing Daqing expertise to the national grain production capacity enhancement strategy.

Keywords: Grain production capacity; Saline-alkali land improvement; Policy-based green credit; Carbon sink pledge

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1. Introduction

Grain security is fundamental to the national economic development. The 15th Five-Year Plan explicitly states that over the next five years, efforts must be made simultaneously to enhance grain production capacity, promote ecological farming practices, and increase both output and income. It calls for coordinated development of technology-driven agriculture, green agriculture, quality agriculture, and branded agriculture, aiming to establish agriculture as a modern, large-scale industry. China will intensify implementation of a new round of grain production capacity enhancement initiatives, totaling 50-million-ton, to strengthen the supply guarantee capacity for grain and other critical agricultural products. In executing this strategy, Heilongjiang Province must serve as a steadfast bulwark for national food security. All 13 prefecture-level cities across the province must collaborate to pool all available resources, ensuring stable production and increased income while firmly securing the national food supply.

2. Current status of grain production capacity and saline-alkali land improvement in Daqing City

Located on the Songnen Plain, Daqing City boasts a vast land area but is characterized by extensive saline-alkali land and abandoned farmland. It serves as the primary distribution zone for saline-alkali land in Heilongjiang Province, most of which are non-prime farmland. Despite limited arable land suitable for cultivation, the Daqing municipal government has actively implemented the strategy of "Storing grain in the land and storing grain through technology", achieving consecutive bumper grain harvests and prosperous farming seasons for local farmers [1]. The 2026 Daqing Municipal Government Work Report indicates that in 2025, Daqing grain production exceeded 4.75 million tons for the first time, accounting for 4.8% of Heilongjiang Province total grain crop sown area while yielding nearly 6% of the provinces grain output, marking the 27th consecutive year of bumper harvests **(Figure 1)**. This achievement is underpinned by the simultaneous expansion of sown area and improvement in yield levels, as well as the effective implementation of the strategy to "Store grain in land" and "Store grain through technology".

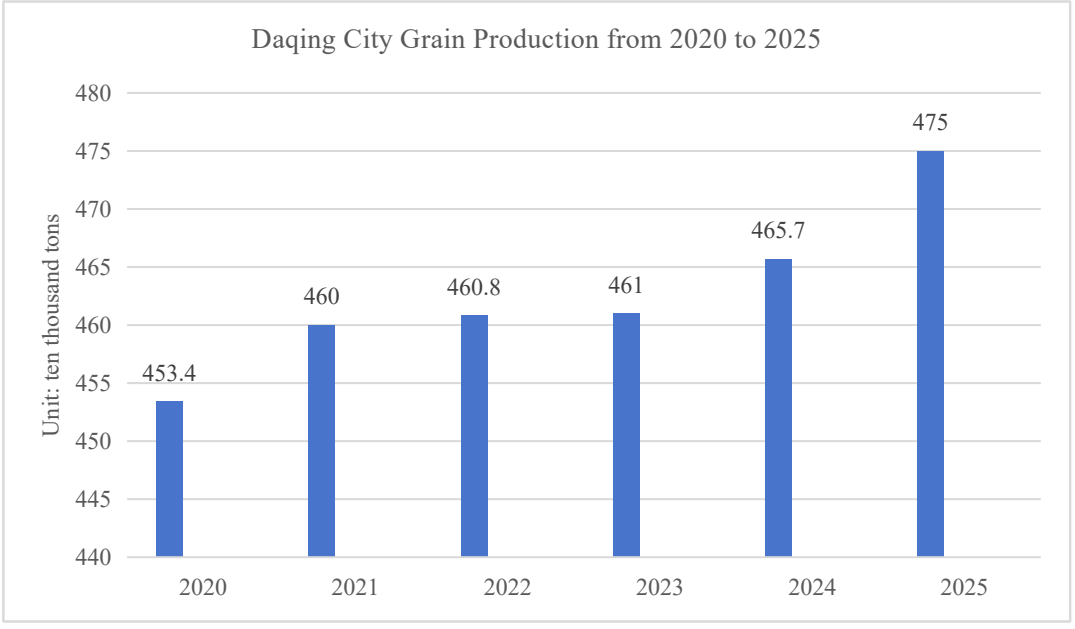

Figure 1. Grain production in Daqing City from 2020 to 2025.

Data source: Daqing Municipal National Economic and Social Development Statistical Bulletin, Daqing Municipal Government Work Report.

As mentioned, a significant portion of Daqing City land resources consist of saline-alkali land. To maximize grain production capacity based on available cultivated land, the Daqing municipal government has collaborated with institutions such as Heilongjiang Bayi Agricultural University and the Daqing Branch of the Heilongjiang Academy of Agricultural Sciences to continuously improve these saline-alkali land through cultivation techniques. This effort has effectively implemented the "Technology-driven grain production" strategy, yielding remarkable results. Datong District has developed the "Eight Methods for Saline-Alkali Land Improvement," tailored to local conditions, which not only reduced both pH levels and salt content but also increased organic matter levels and yield per mu (1 mu ≈ 0.1647 acres). Since 2019, Daqing has approved 45 saline-alkali land improvement projects, primarily located in Datong District, Zhaozhou County, Zhaoyuan

County, and Duerbert Mongolian Autonomous County. Twenty-four projects have been successfully verified and registered, covering a total area of 75,000 mu with an additional 58,000 mu of newly cultivated land. Currently, 21 remaining projects are under construction, expected to add 66,000 mu of arable land within 2–3 years.

3. Current status of financial support for saline-alkali land improvement in Daqing City

Since 2019, the Daqing Municipal Government has actively implemented the saline-alkali land improvement project in accordance with the "Notice of the Heilongjiang Provincial Peoples Government on Issuing the Work Plan for the National Standardization Innovation Pilot Program in Heilongjiang Province" and the "Notice of the Heilongjiang Provincial Peoples Government on Issuing the Heilongjiang Provincial Industrial Revitalization Action Plan (2022–2026)". In 2024, the National Innovation Demonstration Conference on Salt-Tolerant Rice Technology was held in Daqing, where domestic industry experts conducted on-site yield assessments of the first-year improved fields covering 1,000 mu of severely saline-alkali land at the Daqing Experimental Station of the Heilongjiang Academy of Agricultural Sciences. The yield exceeded 400kg per mu, establishing these fields as a national model for saline-alkali land remediation.

Capital investment is a prerequisite for saline-alkali land improvement. The Daqing Municipal Government secured fiscal funds from higher authorities and actively obtained provincial-level financial subsidies totaling 2.2 million yuan in 2024 for the comprehensive management of saline-alkali farmland. The project implemented engineering measures such as micro-sprinkler irrigation for salt removal, excavation of drainage ditches, and underground pipeline salt drainage systems, while employing agronomic and biological technologies to enhance yields and continuously improve farmland quality. Through the integrated application of biotechnology, agricultural engineering, information technology, and ecological restoration techniques, grain production capacity in saline-alkali land was significantly boosted. Upon completion, farmers across all districts and counties benefited, with yield increases of 12% per mu for conventional crops and approximately 23% for cash crops, resulting in additional income of 132–430 yuan per mu. This initiative effectively ensured increased agricultural production, improved agricultural efficiency, and higher farmer incomes [2]. Building on this foundation, the Daqing Municipal Government further secured provincial fiscal transfer payments to support the saline-alkali land improvement project. Efforts to coordinate with policy banks for policy-based funding have yielded initial success. In 2024, the Agricultural Development Bank of China Heilongjiang Provincial Branch collaborated with the Zhaozhou County Government to tailor financial service solutions for enterprises investing in saline-alkali land remediation, securing the provinces first loan of 58 million yuan for such projects-a milestone that enhanced the efficiency of comprehensive saline-alkali land management. Private capital has actively flowed into regional saline-alkali land improvement initiatives. Guided by the pilot zone development plan and government funding, market-oriented operations and professional management have encouraged greater private investment. Regional incentive policies for areas showing preliminary improvement results, implemented through a "build-first, subsidize-later" approach, have significantly boosted participation enthusiasm among market stakeholders. Private capital is now inflowing at a rate of 14%–20%. Once resembling white veils or winter snow, the saline-alkali land now feature well-organized irrigation networks and orderly cultivated fields, further solidifying Heilongjiang's position as Chinese top grain-producing province.

4. Analysis of fiscal and financial issues in the process of saline-alkali soil improvement and grain production capacity enhancement in Daqing City

4.1. Limited scale of financial support

In recent years, Daqing City has taken the responsibility of safeguarding the nations "Five Major Security Domains," continuously strengthened its role in ensuring grain production capacity, closely aligned with Heilongjiang Province "4567" modern industrial system framework, effectively implemented the grain production capacity enhancement strategy, and actively sought financial support for saline-alkali land improvement. Under the current funding system, most resources come from government fiscal funds at various levels, which are allocated through fiscal budget applications. Although the absolute amounts have increased annually, both the total scale and growth rate remain limited. Furthermore, given that saline-alkali land improvement constitutes a typical public good, inflows of bank funds and social capital are relatively constrained. Overall, financial support for saline-alkali land improvement remains limited in scale.

4.2. The forms of credit support are limited

In supporting the development of the real economy, banking financial institutions tend to allocate more credit funds to projects with sufficient collateral or better profit prospects. Regarding the improvement of saline-alkali land, regardless of the type of market entity implementing it, the outcomes are often uncertain and require extended timelines. For profit-oriented banking institutions, this poses certain operational risks. Although banking institutions have actively responded to government initiatives in recent years to support the real economy, their assistance has primarily focused on adjusting credit quotas rather than innovating financial product offerings-particularly for public projects like saline-alkali land improvement, where support remains insufficient.

4.3. The cost of fund utilization is relatively high

The improvement of saline-alkali land carries significant public welfare implications, necessitating encouragement for various social entities to provide financial support for this initiative. For government-funded resources, the cost of utilization is the lowest, but their application is constrained by the fiscal budget allocation cycle, resulting in time costs due to periodic investments. Banking institutions, in supporting saline-alkali land improvement efforts, have responded to the Peoples Bank of China call to serve the real economy by providing funding at state-guided interest rates for local projects. While this keeps funding costs relatively low, it consequently yields lower returns for these institutions, leading to sluggish growth in their credit support scale and higher operational costs for implementing entities. Social capital inherently exhibits profit-seeking characteristics; however, limited macroeconomic conditions drive up funding costs. For public infrastructure projects with uncertain returns, implementation costs remain relatively high [3].

4.4. Limited funding support channels

The Songnen Plain serves as Chinese primary production base for high-quality japonica rice, bearing the critical responsibility of ensuring national food security. However, Daqing jurisdiction still encompasses vast areas of untreated saline-alkali land, making its remediation and reutilization imperative. Financial investment is pivotal in saline-alkali land improvement. To align with the national food security strategy and the new round of grain

production capacity enhancement initiatives, Daqing City must adopt comprehensive planning and proactive guidance to expand funding channels for such projects. In 2024, during field research, the Zhaozhou County Branch of the Agricultural Development Bank of China Heilongjiang Provincial Branch seized opportunities by collaborating with local authorities and delivering targeted marketing efforts. It tailored financial service solutions for enterprises investing in saline-alkali land remediation and secured, through coordinated provincial, municipal, and county-level coordination, Heilongjiang's first loan of 58 million yuan for a saline-alkali land restoration project-significantly boosting comprehensive land management efficiency. To fully realize the benefits of saline-alkali land remediation and effectively boost regional grain production capacity, reliance on fiscal and policy funds alone is insufficient; broad societal participation must be actively pursued to ensure the smooth implementation of these two strategic priorities.

5. Fiscal and financial policy support strategies for Daqing saline-alkali land improvement and grain production capacity enhancement

5.1. Further expand the scale of financial support

The improvement of saline-alkali land yields benefits for both the present and future generations. To achieve this, a collaborative investment mechanism combining "fiscal funds, policy-based credit funds, and social capital" should be established to expand financial support for saline-alkali land remediation. First, fiscal funds must continue to play a pivotal role. Given the public goods nature of saline-alkali land, fiscal resources must serve as the primary driver in remediation efforts. The Daqing Municipal Government should develop the "Saline-Alkali Land Remediation Implementation Plan" by leveraging advanced experiences from successful remediation regions across the province and beyond, tailored to the city's specific geographical distribution and characteristics. Concurrently, local governments at all district and county levels should establish region-specific remediation protocols based on local conditions, ensuring timely and targeted allocation of fiscal funds through a comprehensive planning framework. By integrating remediation effectiveness data from 13 prefectures and cities across the province, a special bond application should be submitted to the Ministry of Finance through the Heilongjiang Provincial Government, prioritizing funding allocation to Daqing central saline-alkali land zone. Moreover, alongside sustained growth in fiscal funding, policy-based credit support must be enhanced. Governments at all levels should facilitate communication between policy financial institutions and remediation implementers, ensuring smooth information exchange and coordinated implementation. Additionally, diversified funding channels should also be established, and funding support mechanisms should be expanded. Furthermore, actively encourage the participation of private capital. Given the high level of engagement from private capital, we should incentivize entities with vested interests in saline-alkali land remediation to join the regional funding system for such projects. Clear guidelines should be established regarding the methods, pathways, profit distribution, and exit mechanisms for private capital involvement to address funding gaps.

5.2. Innovative forms of credit funding support

Banking financial institutions within their jurisdictions should further enhance their service awareness and play a pivotal role in providing financial support during the national and Heilongjiang Provinces grain production capacity enhancement initiatives, thereby safeguarding the smooth implementation of the "Food Security" strategy. Firstly, they should increase total credit allocation during fund disbursement. In saline-alkali land remediation projects, banking institutions must proactively collaborate with public infrastructure improvement programs, expand financial support scales, and comprehensively consolidate foundational projects for grain

production capacity enhancement. Secondly, innovation in financial product offerings must be strengthened. Financial support should not be limited to adjusting overall credit volumes; instead, market-oriented research should be conducted regarding land composition analysis, talent development, technological upgrades, equipment modernization, and the selection of suitable crops for saline-alkali land remediation-including identifying implementing entities and determining optimal implementation timelines-and subsequently adjust credit support mechanisms and innovate financial product designs. Taking the development of suitable crop varieties as an example: when soil salinity exceeds 0.1%, the growth of conventional crop varieties becomes impaired; when salinity suddenly surpasses 0.3%, yields of most crops decline significantly. Therefore, when providing loans for saline-alkali land remediation projects targeting suitable crops, institutions could consider issuing credit loans secured by future income streams-specifically, creating crop expected income rights pledge loans-to protect all stakeholders involved in the remediation efforts.

5.3. Reduce the cost of fund utilization

Given the public welfare nature of saline-alkali land improvement, a systematic review should be conducted regarding funding entities, scales, and sources based on cost-effectiveness considerations. Fiscal funds, due to their transferable expenditure characteristics in public projects, incur the lowest operational costs. Therefore, during Daqing saline-alkali land improvement initiatives, authorities should continuously seek additional fiscal support from higher-level governments based on improvement outcomes and grain production capacity gains, while developing comprehensive medium-to-long-term improvement plans to reduce time-related costs. Banking institutions actively respond to the grain production enhancement strategy by adjusting credit allocation scales and cycles to support the entire grain value chain-from cultivation to processing and marketing-thereby gradually lowering funding costs while boosting production efficiency. Leveraging the profit-driven nature of private capital, the Daqing municipal government has formulated support mechanisms for private investment in saline-alkali land improvement projects, guiding capital flows and reducing scale-related costs. Pilot zones such as Duerbert County and Datong District, where saline-alkali land is concentrated, should serve as demonstration areas for private capital deployment. By standardizing investment scopes and regions while ensuring equitable profit distribution from improvement returns, this approach not only reduces social funding costs but also enhances private sector participation enthusiasm, solidifying Daqing foundation for grain production capacity enhancement. This project supports the smooth implementation of the new round of strategy to enhance grain production capacity by 50-million-ton.

5.4. Expand funding support channels

In the process of saline-alkali land improvement, it is essential to integrate the distribution areas of such lands in Daqing City with the entire implementation cycle before, during, and after the improvement phase. A systematic medium-and long-term investment plan should be formulated, along with a comprehensive financial support framework for the entire improvement process. On this basis, a standardized funding mechanism for saline-alkali land improvement should be established to effectively support the implementation of the new grain production capacity strategy. During the initial phase-covering power infrastructure installation, field demarcation, field road construction, land leveling, and the establishment of irrigation canals and pumping stations-fiscal funds should dominate the investment. In the mid-phase, when initial improvement results are evident and activities such as applying soil amendments and fertilization are underway, a communication bridge should be established between improvement implementers and banking institutions to facilitate credit fund allocation, thereby stabilizing investors' confidence and enhancing the predictability of operational returns. In the later phase, as tangible benefits become apparent, fiscal transfer funding support should gradually decrease while

actively encouraging sustained credit investment. This approach will guide social capital toward saline-alkali land improvement, unlocking its “Dormant Value” and transforming “Blind Spots” into productive “Agricultural Zones”.

6. Conclusion

As quoted, “When granaries are full, the world enjoys peace.” Food security is a matter of paramount importance to the nation. Heilongjiang Province must continue to firmly shoulder its role as a stabilizing force in national food security to ensure that Chinese food reserves contain an even greater quantity of domestic grain. Daqing City should further implement the strategies of “Storing grain in land” and “Storing grain through technology,” leveraging coordinated fiscal and financial resources to enhance regional resource endowments, increase grain production, bolster confidence in regional development, drive urban transformation and upgrading, and contribute Daqing strength to the successful implementation of the nation’s new round of grain production capacity enhancement strategy.

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Disclosure statement

The authors declare no conflict of interest.

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