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RESEARCH ON ISSUES AND COUNTERMEASURES OF AGRICULTURAL OPENING-UP IN LIAONING, CHINA UNDER THE “BELT AND ROAD” INITIATIVE

Abstract. This study provides a comprehensive investigation into the current status, structural constraints, and development prospects of international agricultural opening-up in Liaoning Province within the framework of the Belt and Road Initiative (BRI). As the only coastal province in Northeast China and a strategically positioned node, Liaoning possesses significant geographical advantages and rich agricultural resources. However, despite these endowments, the province's agricultural sector encounters persistent structural constraints that limit its ability to translate comparative advantages into sustainable competitive advantages in international markets. The research employs a mixed-methods approach integrating quantitative analysis of trade data from 2015 to 2023 with qualitative case studies and a systematic literature review. Quantitative techniques include descriptive statistics to characterize export trajectories, comparative analysis against national averages, and market concentration measurements to assess diversification.

The findings reveal a complex picture of achievements alongside persistent structural problems. Regarding export performance, Liaoning's agricultural export value demonstrated growth until 2019, followed by a contraction during the COVID-19 pandemic and a recovery starting in 2022. However, the province's share of national agricultural exports has declined, indicating a relative loss of competitiveness. Analysis of the export structure reveals a heavy concentration in primary products with limited processing intensity, particularly aquatic products. Market diversification analysis indicates that while exports now span over 100 regions, concentration in traditional markets like Japan, the United States, and South Korea persists. The research identifies three major categories of constraints: industrial competitiveness deficiencies characterized by low value-added products, cooperation model limitations including enterprise capability gaps, and support system inadequacies in logistics and human capital.

Drawing on global value chain theory and international perspectives on green barriers and digital transformation, the study proposes comprehensive countermeasures. These include enhancing industrial competitiveness through high-value product clusters, deepening cooperation models through enterprise consolidation and digital traceability, and improving support systems by developing cold-chain logistics and innovative financial products. The study makes several original contributions by providing a systematic diagnosis of Liaoning's agricultural opening-up through the lens of value chain upgrading. It integrates international perspectives on emerging challenges and strengthens the micro-level analysis of enterprise constraints. Ultimately, the research concludes that achieving high-quality agricultural opening-up requires a coordinated effort to transform regional advantages into a sustainable international strategy, contributing to both academic understanding and practical policy development for Liaoning's revitalization.

Keywords: Belt and Road Initiative, Liaoning Province, Agricultural Opening-Up, Global Value Chains, Export Competitiveness, International Cooperation, Regional Development, Mixed-Methods Research.

JEL Classification: Q11; Q13; Q17; Q18.

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Introduction. Liaoning Province, located in southern Northeast China, is the region's only coastal province, bordering the Bohai Sea and Yellow Sea. It serves as a critical gateway to North China, East China, and international markets, boasting important ports like Dalian and Yingkou. With an area of 148,000 square kilometers and a population of 42 million, its capital Shenyang, is the political and economic center of Northeast China, while Dalian is a major port city. As a vital national grain production base, Liaoning's main agricultural products include corn, rice, fruits (particularly apples), and aquatic products, which have established considerable recognition in both domestic and international markets¹.

Under the "Belt and Road" initiative, Liaoning is leveraging its geographical, resource, and industrial advantages to actively participate in international agricultural cooperation, aiming to drive agricultural modernization and global development. The province has established three national-level agricultural opening-up pilot zones, including Dalian Jinpu New Area, and has witnessed steady growth in agricultural trade with BRI countries. However, despite these achievements, Liaoning's agricultural opening-up faces persistent challenges that constrain its potential for high-quality development.

The object of this research is the agricultural opening-up process and international cooperation system of Liaoning Province under the "Belt and Road" Initiative. The subject of the research encompasses the economic mechanisms, structural characteristics, existing problems, and developmental patterns of Liaoning's agricultural opening-up, with particular focus on export competitiveness, international cooperation models, and supporting policy systems.

The purpose of this study is to systematically analyze the current situation, identify key constraints, and propose targeted countermeasures for promoting high-quality development of Liaoning's agricultural opening-up within the BRI framework. To achieve this purpose, the research addresses the following specific objectives:

1. To comprehensively assess the achievements and current status of Liaoning's agricultural opening-up from 2015

to 2023, including export scale, structural characteristics, and cooperation mechanisms.

2. To diagnose the major problems and structural constraints impeding Liaoning's agricultural internationalization, including industrial competitiveness deficiencies, cooperation model limitations, and support system inadequacies.

3. To integrate international theoretical perspectives on global value chains, green barriers, digital transformation, and responsible agricultural investment that are underrepresented in domestic research.

4. To develop systematic countermeasures across industrial, cooperative, and institutional dimensions that can guide policy formulation and enterprise strategy.

The significance of this research lies in its contribution to both academic literature and policy practice. Theoretically, it bridges domestic and international research traditions by applying global value chain frameworks to regional agricultural opening-up analysis while incorporating emerging international concerns about sustainability and inclusivity. Practically, it provides evidence-based policy recommendations for Liaoning and similar agricultural regions seeking to enhance their international competitiveness under megaregional initiatives.

Literature Review.

1. Domestic Research on Agricultural Opening-Up in Liaoning

Domestic scholarship on Liaoning's agricultural opening-up has developed considerably since the BRI's inception, with researchers focusing on three primary dimensions: export competitiveness, structural characteristics, and policy support systems. Liu (2020) provided foundational analysis of Liaoning's agricultural opening-up pattern, arguing that the province's geographical advantages have not been fully translated into international competitiveness due to institutional constraints and enterprise capability limitations. This early work established the framework for subsequent research by identifying the gap between Liaoning's resource endowments and its actual performance in international markets.

Zhao (2022) conducted comprehensive research on the competitiveness and influencing factors of Liaoning's agricultural exports, employing quantitative methods to analyze trade data from 2010 to 2020. The study revealed that Liaoning's agricultural exports suffer from "low-end lock-in," characterized by concentration in primary products with minimal processing and

¹ Liaoning Provincial Bureau of Statistics. (2024). Liaoning statistical yearbook 2024. China Statistics Press. URL: <https://tjj.ln.gov.cn/tjj/tjsj/tjnj/index.shtml> (date of access: 10.12.2025).

consequently low value capture. Zhao's econometric analysis identified that technological innovation capacity, brand development, and logistics efficiency are the most significant determinants of export competitiveness, with Liaoning underperforming in all three dimensions compared to leading agricultural provinces such as Shandong and Guangdong.

Pu and Wu (2022) examined the characteristics, problems, and countermeasures of agricultural outward investment from Liaoning under the BRI, providing valuable insights into enterprise-level internationalization behavior. Their research found that Liaoning's agricultural enterprises engaged in overseas investment are predominantly small and medium-sized private firms with limited capital, technological capabilities, and international experience. This results in investment patterns concentrated in single production links rather than full industrial chain development, limiting the potential for value capture and sustainable internationalization.

Ge, Li, and Liu (2023) explored agricultural product brand cultivation strategies in Liaoning, highlighting that while the province possesses numerous geographical indication products such as Panjin Rice and Dalian Sea Cucumber, their international brand awareness remains severely limited. The study attributed this deficiency to inadequate marketing investment, insufficient quality standardization, and weak coordination between producers and exporters.

Liu and Dong (2024) investigated the impact of agricultural digital economy on the sustainable development of China's agricultural exports, with specific implications for Liaoning. Their research demonstrated that digital transformation can significantly enhance export competitiveness through improved traceability, reduced transaction costs, and better market access. However, they also warned of the "digital divide" risk, whereby small agricultural entities may be marginalized if digital empowerment policies are not designed inclusively.

Luo and Lin (2024) analyzed the current status, challenges, and future support policies for agricultural e-commerce development, providing insights relevant to Liaoning's export promotion strategies. Their research emphasized that e-commerce platforms offer significant opportunities for small and medium-sized agricultural enterprises to access international markets, but require supporting infrastructure in logistics, payment systems, and digital skills training.

2. International Research on Global Agricultural Value Chains and Opening-Up

International scholarship provides complementary theoretical perspectives and analytical frameworks that enrich understanding of regional agricultural opening-up challenges. Gereffi and Lee (2016) developed foundational theory on economic and social upgrading in global value chains (GVCs), arguing that participation in GVCs does not automatically lead to upgrading; rather, governance structures and institutional contexts critically determine whether developing country producers can capture increasing value shares. This theoretical framework is directly applicable to understanding Liaoning's position in agricultural GVCs, where primary product exports represent participation without upgrading.

Anderson and Strutt (2016) examined the implications of emerging economy productivity growth for global agricultural trade patterns, employing computable general equilibrium models to project structural changes to 2030. Their research highlighted that regional trade agreements increasingly reshape agricultural production and trade flows, with implications for provinces like Liaoning that must navigate multiple overlapping trade regimes including RCEP and bilateral BRI agreements.

Martin (2019) provided comprehensive analysis of trade policy and food security interlinkages, demonstrating that agricultural trade liberalization has complex distributional consequences that require careful policy calibration. This research is particularly relevant for understanding the tension between export promotion and domestic food security concerns that shapes agricultural opening-up policies in China.

Deacon (2022) examined the greening of global value chains and implications for developing country exporters, introducing the concept of "green barriers" as emerging non-tariff measures. The research documented how environmental sustainability standards, including carbon footprint requirements and eco-certification, are being embedded into global agricultural trade rules through initiatives such as the EU's "Farm to Fork" strategy. This perspective suggests that Liaoning's agricultural opening-up strategy must integrate green development and low-carbon transition as core competitive advantages rather than compliance burdens.

Borras and Franco (2018) provided critical analysis of "land grabbing" and the social consequences of large-scale cross-border agricultural investments.

Their research, situated within broader debates about responsible agricultural investment, emphasizes that international agricultural cooperation must transcend narrow economic efficiency considerations to address impacts on local community rights, environmental sustainability, and food security. This perspective has direct relevance for Liaoning's agricultural "Going global" strategy, suggesting the need for robust social responsibility frameworks.

3. Synthesis and Research Gap

Synthesizing domestic and international literature reveals both complementarities and gaps. Domestic research provides detailed empirical analysis of Liaoning's specific situation, identifying structural problems in export composition, enterprise capabilities, and policy support. However, it exhibits two main shortcomings. First, domestic studies predominantly focus on macro-level policies and industrial aspects, with insufficient exploration of micro-level behavioral constraints facing agricultural enterprises and cooperatives. Second, domestic engagement with cutting-edge international issues – including carbon border tariffs, responsible investment guidelines, and digital divide concerns – remains limited.

International research offers more advanced theoretical perspectives and critical reflection on the social and environmental dimensions of agricultural opening-up. However, its conclusions are often based on contexts in Africa, Southeast Asia, or Latin America, requiring careful localization and adaptation to China's specific institutional

and cultural environment. The challenge for Liaoning's agricultural opening-up research is to integrate these perspectives while maintaining attention to provincial-level specificities.

Research Methodology. This study primarily employs a mixed-methods approach, integrating qualitative research with quantitative analysis, to systematically investigate the problems and countermeasures of Liaoning's agricultural opening-up under the Belt and Road Initiative. The specific research methods are as follows.

1. Literature Review (Methodology)

The author extensively references and cites relevant domestic and international policy documents (e.g., plans from the Ministry of Agriculture and Rural Affairs), academic research (e.g., "Research on the Competitiveness and Influencing Factors of Liaoning's Agricultural Exports"), and reports from international organizations (e.g., UNCTAD data). This process helped establish the analytical framework and provided theoretical support for the arguments.

2. Quantitative Analysis

This is one of the core research methods. The author extensively utilizes Historical Statistical Data Analysis and Comparative Analysis. The study collects and analyzes longitudinal time-series data from 2015–2023 on Liaoning's agricultural exports, including total export value, growth rate, and share of provincial exports, to objectively describe achievements and trends. By horizontally comparing Liaoning's data with the national average and with leading agricultural

Table 1. Export Data of Agricultural Products in Liaoning Province (2015–2023, Unit: USD billion)

Year	Agricultural Export Value (USD billion)	Total Provincial Export Value (USD billion)	Share of National Exports (%)	Year-on-Year Growth Rate
2015	4.79	50.84	6.83	-
2016	4.55	43.07	6.27	-4.9%
2017	4.90	44.88	6.52	+7.6%
2018	5.14	48.80	6.47	+4.7%
2019	5.14	45.44	6.54	+0.1%
2020	4.33	38.33	5.69	-15.8%
2021	4.02	51.25	4.77	-7.1%
2022	4.47	53.82	4.55	+11.3%
2023	4.50	50.28	4.55	+0.7%

Source: Compiled by the author based on data from UN Comtrade Database (2025)¹ and Liaoning Provincial Bureau of Statistics (2024)²

1 Trade data for China, Liaoning Province. UN Comtrade Database. United Nations. 2025. URL: <https://comtradeplus.un.org/> (date of access: 10.12.2025).

2 Liaoning Provincial Bureau of Statistics. Liaoning statistical yearbook 2024. China Statistics Press. 2024. URL: <https://tjj.ln.gov.cn/tjj/tjsj/tjnj/index.shtml> (date of access: 10.12.2025).

provinces like Shandong (e.g., processing conversion rate, enterprise investment scale), the study clearly reveals Liaoning's relative position and existing gaps. Furthermore, it quantifies structural issues in exports using indicators like market concentration (HHI Index).

3. Case Study Method

The paper incorporates analysis of specific practical cases, such as mentioning the policy effectiveness of “three national-level agricultural opening-up pilot zones, including Dalian Jinpu New Area” and specific market cases like “Liaoning's exported peppers account for approximately 50% of the South Korean market”. These cases make the research conclusions more concrete and credible.

4. Descriptive Statistics and Problem Induction

Based on data and cases, the author conducts comprehensive descriptive statistics on the current state of Liaoning's agricultural opening-up. Systematically, from the three dimensions of “product structure”, “core enterprises”, and “policy support”, the core problems are identified and summarized.

5. Normative Analysis and Countermeasure Derivation

Following problem diagnosis, the paper uses normative analysis to propose clear development goals and specific countermeasures (e.g., “cultivate 10 high-value-added product clusters”, “establish a 5-billion-yuan fund”). These countermeasures

are logically derived from the preceding analysis, aiming to solve the identified problems, reflecting the application-oriented nature and value of the research.

In summary, this research utilizes a variety of methods to form a complete logical chain from “current situation description--data analysis--problem diagnosis--proposal of countermeasures”. The core characteristic of its methodology is basing arguments on detailed objective data, using literature and policy as references, and systematically comparing and inducing to finally draw targeted and actionable conclusions.

Main Results.

1. Achievements in Agricultural Opening-Up in Liaoning under the “Belt and Road” Initiative

1.1 Current Status of Agricultural Product Exports in Liaoning

1.1.1 Export Scale

As shown in Table 1, from 2015 to 2023, the export and import trade of agricultural products in Liaoning Province generally exhibited a slow fluctuation trend, initially rising, then declining, and later rebounding. This trend aligns with the overall trajectory of national agricultural product trade. The export value of Liaoning's agricultural products increased from USD 4.79 billion in 2015 to a peak of USD 5.14 billion in 2019, followed by a slight decline due to the impact of the pandemic and global trade contraction. A modest recovery began in 2022, reflecting the overall economic rebound

Table 2. Export Markets for Liaoning Agricultural Products (2019–2023, Unit: CNY billion)

Country	2019	2020	2021	2022	2023
Japan	9.7	8.7	8.3	8.5	7.9
United States	5.6	5.2	4.4	5.4	4.5
South Korea	3.8	3.4	3.1	3.3	3.5
Germany	1.8	1.5	1.3	1.6	1.7
Netherlands	1.2	1.1	1.0	1.1	1.0
Thailand	0.6	0.8	0.7	0.7	1.0
Australia	0.4	0.4	0.4	0.5	0.5
Vietnam	0.2	0.3	0.3	0.5	0.4
Malaysia	0.3	0.3	0.2	0.3	0.4
Singapore	0.3	0.3	0.3	0.3	0.3
Cambodia	0.2	0.2	0.3	0.3	0.3

Source: compiled by the author according to the date (National Bureau of Statistics of China¹ and UN Comtrade Database²)

1 China statistical yearbook 2025. China Statistics Press. National Bureau of Statistics of China. 2025. URL: <https://www.stats.gov.cn/> (date of access: 10.12.2025).

2 Trade data for China, Liaoning Province. UN Comtrade Database. United Nations. 2025. URL: <https://comtradeplus.un.org/> (date of access: 10.12.2025).

in China as pandemic restrictions eased. The gradual recovery of Liaoning's agricultural product exports also indicates its enhanced competitiveness in the global agricultural market and positive development trajectory.

1.1.2 Export Structure

1.1.2.1 Concentrated Export Trade Structure of Agricultural Products

Liaoning Province, a key region in Northeast China, boasts a diverse range of agricultural products with distinct regional characteristics. It is home to 67 national geographical indication products, such as Dalian Sea Cucumber and Panjin Rice. These products are renowned for their exceptional quality and unique characteristics, enjoying significant market share in international markets, particularly in Japan and South Korea. Analysis of the cross-border e-commerce export structure of Liaoning's agricultural products reveals that exports are dominated by primary products with low processing levels. Aquatic products, grains, meat, and fruits and vegetables consistently remain the four major export categories. Labor-intensive products, such as aquatic products, vegetables, and fruits, maintain a high proportion of export value. According to data from the Liaoning Agricultural Trade Promotion Service Platform, the top five exported agricultural products by value in 2023 were aquatic products, vegetables and edible fungi, meat, and fruits. While aquatic

product exports decreased by 4.5%, other categories showed varying degrees of growth.

1.1.2.2 Diversification of Export Trade Partners

With agricultural opening-up, Liaoning's agricultural trade partners have become increasingly diversified and decentralized, now spanning over 100 countries and regions. Japan, the United States, and South Korea are the primary export markets. The European Union, represented by Germany and the Netherlands, is a traditional key market. Under the Regional Comprehensive Economic Partnership (RCEP), Liaoning has strengthened agricultural trade with Southeast Asian countries, leading to positive export growth trends with Thailand, Malaysia, Cambodia, and Vietnam. Guided by the "Belt and Road" Initiative, Liaoning's agricultural trade landscape has transformed from reliance on neighboring markets like Japan and South Korea.

1.1.3 Preliminary Establishment of Agricultural International Cooperation Mechanisms

Liaoning has initially established multi-level agricultural international cooperation mechanisms. On December 8, 2016, the Liaoning Agricultural Product Import and Export Association was established in Shenyang, and its International Trade Service Center created overseas warehouses for agricultural products. However, the depth of Liaoning's agricultural international

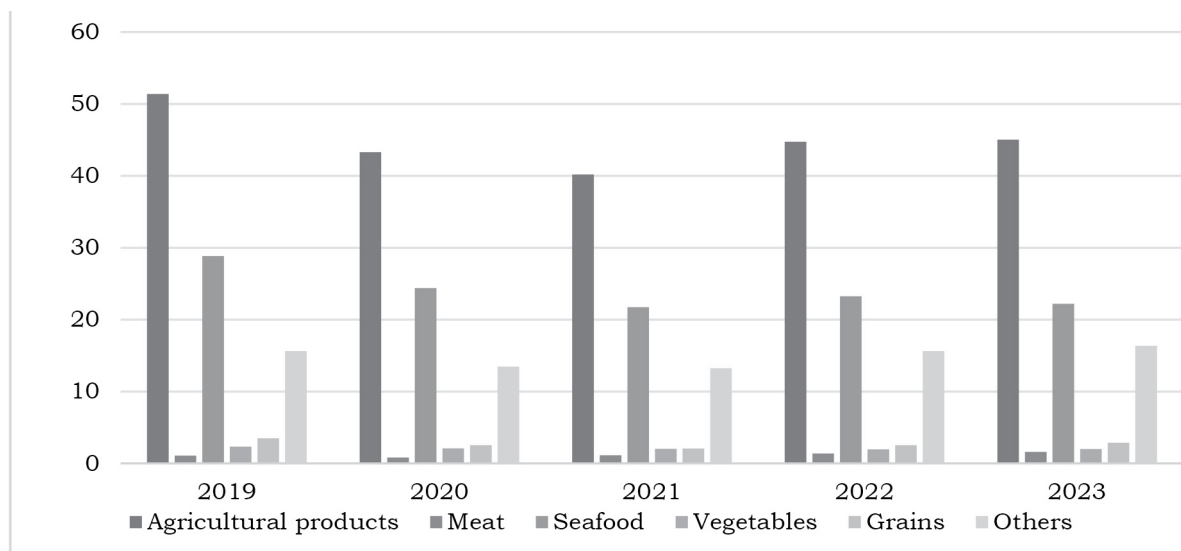


Fig. 1. Export Status of Major Agricultural Products in Liaoning Province (2019–2023, Unit: USD billion)

Source: Compiled by the author based on data from UN Comtrade Database (2025)¹ and National Bureau of Statistics of China (2025)²

1 Trade data for China, Liaoning Province. UN Comtrade Database. United Nations. 2025. URL: <https://comtradeplus.un.org/> (date of access: 10.12.2025).

2 China statistical yearbook 2025. China Statistics Press. National Bureau of Statistics of China. 2025. URL: <https://www.stats.gov.cn/> (date of access: 10.12.2025).

cooperation remains insufficient. On one hand, cooperation is limited mainly to agricultural trade and primary processing, with fewer collaborations in high-end areas such as agricultural technology R&D, talent development, and standard-setting. On the other hand, the effectiveness of cooperation mechanisms needs improvement, as functions like policy coordination, information sharing, and risk prevention are not fully utilized.

2. Major Issues in Liaoning's Agricultural Opening-Up under the "Belt and Road" Initiative

2.1 Weak Competitiveness of the Agricultural Industry and Limited Export Advantages

2.1.1 Monotonous Product Structure and Low Added Value

Liaoning's agricultural exports are dominated by primary products, with a low proportion of deeply processed products, leading to severe homogenization and weak bargaining power in international markets. Additionally, the export market structure is problematic, overly concentrated in a few countries such as Japan, the United States, and South Korea, with insufficient exploration of markets in "Belt and Road" countries. This concentration exposes Liaoning's agricultural exports to high market risks, making them vulnerable to fluctuations in single markets. This positioning in global value chains limits opportunities for learning, capability building, and upgrading (Gereffi & Lee, 2016).

2.1.2 Limited Brand Influence and Lack of International Recognition

Liaoning lacks agricultural brands with international recognition, and its differentiated competitive advantages are not prominent compared to characteristic agricultural products from "Belt and Road" countries. Although Liaoning has distinctive products like Panjin Rice and Dalian Sea Cucumber, their brand awareness and influence in international markets remain limited. Inadequate brand building makes it difficult for Liaoning's agricultural products to achieve brand premiums internationally (Ge, Li, & Liu, 2023). Moreover, despite the rich variety of products, the absence of leading enterprises and flagship brands weakens export competitiveness, and the scale of exports of advantageous products to non-traditional markets is small. The lack of strong brands also reduces market bargaining power when facing international trade barriers.

2.1.3 Technological and Innovation Constraints

Liaoning's agricultural technology development and innovation capacity lag

behind leading agricultural provinces. Agricultural research and development intensity (R&D expenditure as share of agricultural GDP) averages 0.35%, below the national average of 0.52% and substantially below levels in Shandong (0.68%) and Jiangsu (0.71%) (Zhao, 2022).

Technology gaps are particularly evident in areas critical for export competitiveness. Post-harvest processing technology limitations restrict value-added product development. Cold chain technology deficiencies result in loss rates estimated at 15-20% for fresh products during export logistics, compared to 5-8% for leading competitors. Traceability technology adoption remains limited, constraining access to markets requiring detailed provenance information.

2.2 Insufficient Depth of Cooperation with "Belt and Road" Countries and Limited Models

2.2.1 Limited Capabilities of Enterprises and Lack of Leading Players

Most agricultural enterprises in Liaoning engaged in opening-up are small and medium-sized, lacking capital, technology, and overseas operational experience, which hinders their ability to undertake large-scale overseas agricultural projects (Pu & Wu, 2022). Private enterprises are the main body of agricultural outward investment in Liaoning. Although they are market-sensitive, they often lack high-end talent, financial strength, limited information channels, and means to protect their rights compared to state-owned enterprises, making it difficult to manage projects with large investments and long payback periods. Additionally, Liaoning lacks internationally competitive agricultural leading enterprises to spearhead the "Going global" initiative. Most of Liaoning's agricultural enterprises' overseas investments are focused on single production links, with few involving entire industrial chains covering production, processing, storage, logistics, and R&D. Investment cooperation in key value chain segments such as core technology and product branding is even more limited. This situation makes it challenging for Liaoning's agricultural enterprises to form cluster effects and scale advantages in international markets.

2.2.2 Lack of Agricultural Industrial Chain Coordination and Incomplete Layout

Liaoning's agricultural enterprises largely operate independently in the internationalization process, with insufficient coordination in upstream and downstream industries and division of labor. Most enterprises' overseas investments are concentrated in single production links,

lacking the awareness and capability for full industrial chain layout. During the “Going global” process, Liaoning’s agricultural enterprises have yet to establish mature industrial chains. This results in weak competitiveness and risk resistance in international markets.

2.3 Incomplete Service Support System for Opening-Up

2.3.1 Poor Logistics and Infrastructure Connectivity, Low Cross-Border Transport Efficiency

Liaoning’s ports have insufficient logistics connectivity with “Belt and Road” countries, and the low coverage of cold-chain logistics for agricultural products leads to high loss rates and costs during cross-border transportation of fresh products (Liu, 2020). The communication and cooperation among Liaoning’s coastal ports are inadequate, with irrational division of labor and excessive competition. As the largest port in Northeast China, Dalian Port has seen its transportation infrastructure increasingly improved. The overall operation of the China Railway Express (CR Express) remains robust, enabling seamless sea-rail intermodal transport. Although the CR Express (Shenyang) has achieved significant results, it still faces certain challenges, such as a gap in the number of trips, a lack of competitive advantages in customs and port services, an incomplete international logistics network, and a relatively low level of informatization.

2.3.2 Insufficient Financial and Policy Support, Narrow Cross-Border Financing Channels

Liaoning’s agricultural “Going global” faces a lack of financial support, with low coverage of credit insurance and exchange rate hedging tools for agricultural exports. The weak competitiveness of private enterprises and unsystematic outward investment are major constraints. Financial policies are the most urgently needed support for Liaoning’s agricultural outward investment enterprises, especially since overseas financing difficulties for private enterprises hinder their international development. Additionally, policy barriers remain in agricultural policy alignment with “Belt and Road” countries, with complex market access procedures in some countries. Liaoning’s agricultural “Going global” requires a series of government-level supporting measures to ensure coordinated international agricultural cooperation and sustained development (Liu & Hong, 2025). The lack of strong policy guidance means that leading agricultural

enterprises primarily rely on themselves for standardized export base construction, with insufficient investment in market expansion. Without government guidance and support, Liaoning’s geographical advantages are underutilized, limiting international market share and hindering agricultural opening-up¹.

2.3.3 Shortage of Professional Talent, Lagging International Talent Team Building

Liaoning’s agricultural “Going global” faces a shortage of professional talent, particularly interdisciplinary talent proficient in agricultural technology, international trade rules, and the languages and cultures of “Belt and Road” countries. Currently, Liaoning’s agricultural enterprises “Going global” need to further enrich their talent pool with foreign language skills, professional knowledge, international management experience in agriculture, and dedication (Luo & Lin, 2024). Additionally, an imperfect talent cultivation mechanism constrains agricultural opening-up. The lack of effective talent cultivation and introduction mechanisms in the internationalization process hinders enterprises in overseas market research and compliant operations. Furthermore, Liaoning’s relatively low population mobility, driven by its economic downturn, leads most students to seek development in southern China, with only a few returning home, resulting in significant brain drain.

3. Countermeasures for Liaoning’s Agricultural Opening-Up under the “Belt and Road” Initiative

3.1 Enhance Agricultural Industry Competitiveness and Strengthen Export Advantages

3.1.1 Optimize Agricultural Export Structure and Increase Added Value

Liaoning should adjust its agricultural product structure according to international market demand, increasing the export of high-quality products with local characteristics, such as grains, oils, and fruits. Additionally, deep processing of agricultural products should be strengthened to develop high-value-added products. For example, leveraging Liaoning’s rich agricultural resources to develop deep processing functional foods, health products, and other high-end products can enhance added value and international

1 Opinions on accelerating the construction of an open new pattern to lead comprehensive revitalization through comprehensive opening-up. CPC Liaoning Provincial Committee, & Liaoning Provincial People’s Government. Liaoning Daily, 2018, June 2. P. 001. https://www.ln.gov.cn/web/zwgkx/lnsrmzfgb/2018n/qk/2018n_dssq/swwj/FB1115B612E644D9B5C4E6198BB0DD2B/index.shtml (date of access: 10.12.2025).

competitiveness. Moreover, Liaoning should actively cultivate characteristic agricultural product export bases and build export industrial clusters. Key support should be given to export demonstration zones such as Shenyang Liao zhong District for fruits and vegetables, Dalian Lushunkou for seaweed, Dalian Wafangdian for horseradish, Dandong Kuandian County for edible fungi, Tieling Xifeng County for deer products, and Chaoyang Kazuo County for coarse cereals to improve the added value and brand awareness of exported agricultural products (Ge, Li, & Liu, 2023).

3.1.2 Strengthen Brand Building and Enhance International Influence

Liaoning should enhance agricultural brand building, creating internationally influential agricultural brands. This can be achieved by supporting agricultural enterprises in obtaining green food and organic agricultural product quality certifications and improving the quality and safety system for exported agricultural products.[18] Additionally, increased support should be given to the export of characteristic products such as “Panjin Rice”, “Anshan Nanguo Pear”, and “Dalian Sea Cucumber” to non-traditional markets, leveraging the demonstration and leading role of state-owned and leading enterprises to drive the development of small and medium-sized enterprises and private enterprises. Furthermore, Liaoning should strengthen international marketing of agricultural brands to enhance their global visibility and reputation. Participating in international agricultural expos and hosting brand promotion events can help promote Liaoning’s characteristic agricultural brands to “Belt and Road” countries, increasing their international influence (Liu & Hong, 2025).

3.2 Deepen Agricultural Cooperation under the “Belt and Road” Initiative and Innovate Cooperation Models

3.2.1 Cultivate and Expand Agricultural Multinational Enterprises to Enhance International Operational Capabilities

Liaoning should cultivate internationally competitive agricultural multinational enterprises, supporting capable enterprises in optimizing global resource allocation through investment and mergers and acquisitions to enhance international competitiveness. The weak competitiveness and unsystematic outward investment of private enterprises are major constraints. In the future, key agricultural enterprises in Liaoning with a certain foundation should broaden their horizons, utilize both domestic

and international markets and resources, continuously improve their ability to optimize global resource allocation, and strive to enhance their international competitiveness (Pu & Wu, 2022). Additionally, Liaoning should guide small and micro agricultural enterprises to integrate into demonstration cooperation parks built by large enterprises, align with large enterprises’ industrial chains, and promote clustered “Going global” for Liaoning’s agricultural enterprises. This approach can form a pattern of coordinated development between large, medium, and small enterprises, improving the overall competitiveness of Liaoning’s agricultural enterprises.

3.2.2 Build a Comprehensive Agricultural Industrial Chain to Enhance International Competitiveness

Liaoning’s agricultural enterprises should adopt a full industrial chain management mindset and focus on “extending and strengthening the chain”, achieving integrated operations covering production, processing, storage, and logistics. Private enterprises engaged in agricultural outward investment should emphasize industrial linkage effects, fully utilizing the benefits of clusters formed by industrial linkages. Enterprises “Going global” should seize the opportunities and policy benefits of the “Belt and Road” Initiative, rationally allocate resources in relevant countries, firmly establish industrial chain management thinking, gradually form broad and resilient agricultural industrial chains, and fully leverage industrial linkage effects. Additionally, Liaoning should accelerate the digital transformation of agricultural industrial chains, improving their intelligence levels. Establishing traceability systems for agricultural product quality and safety and developing agricultural e-commerce can enhance transparency and efficiency, strengthening international competitiveness (Liu & Dong, 2024).

3.3 Improve the Service Support System for Opening-Up

3.3.1 Strengthen Logistics Infrastructure Construction to Enhance Cross-Border Transport Efficiency

Liaoning should enhance the construction of logistics infrastructure such as ports, railways, and highways to improve the efficiency of cross-border agricultural product transportation. Simultaneously, accelerating the construction of the “Liaoning-Maritime-Europe” sea transport channel can achieve normalized operations, including shipping, port construction, logistics, and other



Fig. 2. The China-Europe freight train crosses both the Caspian and Black Seas

Source: Silk Road Briefing, the Asia Briefing Weekly

infrastructure and service improvements. This makes it possible to consider Istanbul as a logistics hub with the subsequent connection of sea routes for the delivery of goods to Europe, as well as to the Black Sea region, including Chornomorsk in Ukraine. Additionally, Liaoning should develop cold-chain logistics for agricultural products to improve the preservation and transportation capabilities of fresh products. Supporting cold-chain logistics enterprises in building facilities and developing multimodal cold-chain transport can reduce loss rates during transportation, improving product quality and competitiveness.

3.3.2 Strengthen Financial and Policy Support, Broaden Cross-Border Financing Channels

Liaoning should increase financial support for agricultural "Going global", innovating financial products and services to provide diversified financing channels for agricultural enterprises. Actively building financing platforms can provide facilitated financing and loan interest subsidies for enterprises investing in agricultural infrastructure and public services in "Belt and Road" countries. Encouraging financial institutions to innovate product design, establish financing

mortgage guarantee mechanisms for overseas agricultural investment projects, and supporting investment enterprises through overseas bond issuance, internal guarantee external loan, and foreign exchange capital concentration operations can address funding difficulties¹. Additionally, Liaoning should improve the agricultural insurance system to provide risk protection for enterprises "Going global". Strengthening the assessment and safeguarding of risks in overseas agricultural investment, giving full play to policy-based insurance, motivating commercial insurance institutions to develop relevant insurance products, and supporting enterprises in purchasing insurance with certain premium subsidies are essential. Furthermore, Liaoning should enhance policy coordination to provide comprehensive support for agricultural enterprises "Going global". Integrating agricultural investment and industrial information from relevant

1 Opinions on accelerating the construction of an open new pattern to lead comprehensive revitalization through comprehensive opening-up. CPC Liaoning Provincial Committee, & Liaoning Provincial People's Government. Liaoning Daily, 2018, June 2. P. 001. https://www.ln.gov.cn/web/zwgkx/lnsrmzfgb/2018n/qk/2018n_dssq/swwj/FB1115B612E644D9B5C4E6198BB0DD2B/index.shtml (date of access: 10.12.2025).

departments and agencies, building an information service system for Liaoning's agricultural "Going global", closely monitoring laws and regulations in investment destinations, providing timely and effective information services, and regularly hosting agricultural outward investment training and exchange activities can promote information sharing and enterprise cooperation.

3.3.3 Strengthen Talent Cultivation and Enhance International Talent Team Building

Liaoning should strengthen the cultivation of international agricultural talent, providing intellectual support for agricultural "Going global". Vigorously introducing or cultivating high-quality talent with relevant capabilities within enterprises, establishing talent incentive systems that meet the development needs of agricultural "Going global", and providing intellectual support for agricultural outward investment are crucial. Additionally, Liaoning should strengthen cooperation with universities and research institutions to cultivate interdisciplinary talent familiar with international agricultural rules and cross-cultural communication skills. Combining "inviting in" and "Going global" approaches can enhance talent exchange and cooperation with "Belt and Road" countries, improving talent internationalization. Furthermore, Liaoning should establish an international agricultural talent database to provide talent support for agricultural enterprises "Going global". Encouraging and supporting agricultural enterprises to introduce high-level overseas talent can improve their international operational capabilities.

Conclusion. This study systematically analyzed the current status, persistent issues, and development pathways for agricultural opening-up in Liaoning Province under the "Belt and Road" Initiative. The research reveals that while Liaoning has achieved notable progress in expanding export scale, diversifying trade partners, and establishing initial cooperation mechanisms, fundamental structural problems constrain its potential for high-quality development.

The key findings can be synthesized into three main conclusions. First, Liaoning's agricultural export structure suffers from persistent concentration in primary products with limited value-added, resulting in weak international competitiveness and limited value

capture. The province's relative decline in national agricultural export share despite absolute growth indicates structural competitiveness issues requiring systematic attention (Liu, 2020; Zhao, 2022). Second, cooperation with BRI countries remains limited in depth and scope, characterized by fragmented enterprise engagement and incomplete industrial chain development. Enterprise capability constraints, particularly among small and medium private firms, limit the potential for more sophisticated cooperation models involving technology transfer, joint research, and integrated industrial development (Pu & Wu, 2022). Third, support system inadequacies across logistics infrastructure, financial services, and human capital development constrain agricultural internationalization. These systemic deficiencies compound enterprise-level constraints and limit the effectiveness of policy initiatives (Liu & Hong, 2025; Luo & Lin, 2024).

Addressing these challenges requires comprehensive countermeasures across three dimensions. Enhancing industrial competitiveness demands structural optimization, value addition, and brand development (Ge, Li, & Liu, 2023). Deepening cooperation models requires enterprise capability development and full industrial chain integration (Pu & Wu, 2022). Improving support systems requires logistics infrastructure investment, financial innovation, and talent cultivation (Liu & Hong, 2025; Luo & Lin, 2024). Throughout, risk prevention mechanisms must ensure sustainable and responsible international engagement (Borras & Franco, 2018).

Promoting deep integration of Liaoning's agriculture into the BRI framework constitutes a systematic project requiring coordinated efforts from government, enterprises, and social organizations. Success requires transforming comparative advantages – Liaoning's geographical position and agricultural resource endowments – into sustainable competitive advantages through strategic investment, capability development, and institutional innovation. The findings of this research provide evidence-based guidance for this transformation, contributing to both academic understanding of regional agricultural internationalization and practical policy development for Liaoning's comprehensive revitalization.

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ДОСЛІДЖЕННЯ ПРОБЛЕМ ТА ЗАХОДІВ ЩОДО УТВОРЕННЯ ВІДКРИТОГО СІЛЬСЬКОГОСПОДАРСЬКОГО РИНКУ В ПРОВІНЦІЇ ЛЯОНІН, КИТАЙ, У РАМКАХ ІНІЦІАТИВИ «ПОЯС І ШЛЯХ»

У цьому дослідженні надано всебічний аналіз поточного стану, структурних обмежень та перспектив розвитку відкритості міжнародної торгівлі сільськогосподарською продукцією в провінції Ляонін у рамках ініціативи «Пояс і шлях» (BRI). Як єдина прибережна провінція на північному сході Китаю та стратегічно важливий вузол, Ляонін має значні географічні переваги та багаті сільськогосподарські ресурси. Однак, незважаючи на ці переваги, сільськогосподарський сектор провінції стикається з постійними структурними обмеженнями, що обмежують його здатність перетворювати порівняльні переваги на стійкі конкурентні переваги на міжнародних ринках. У дослідженні використовується підхід, що поєднує кількісний аналіз торговельних даних за період з 2015 по 2023 роки з якісними тематичними дослідженнями та систематичним оглядом літератури. Кількісні методи включають описову статистику для характеристики динаміки експорту, порівняльний аналіз із середніми показниками по країні та вимірювання концентрації ринку для оцінки диверсифікації.

Результати дослідження виявляють складну картину, що поєднує досягнення та стійкі структурні проблеми. Щодо показників експорту, то вартість сільськогосподарського експорту провінції Ляонін демонструвала зростання до 2019 року, після чого відбулося скорочення під час пандемії COVID-19 та відновлення, що розпочалося у 2022 році. Однак частка провінції у загальнонаціональному експорті сільськогосподарської продукції зменшилася, що свідчить про відносну втрату конкурентоспроможності. Аналіз структури експорту показує значну концентрацію на сировинних товарах з обмеженою інтенсивністю переробки, зокрема на продуктах рибно-

го господарства. Аналіз диверсифікації ринків свідчить, що, хоча експорт зараз охоплює понад 100 регіонів, зберігається концентрація на традиційних ринках, таких як Японія, США та Південна Корея. Дослідження визначає три основні категорії обмежень: недоліки промислової конкурентоспроможності, що характеризуються продукцією з низькою доданою вартістю; обмеження моделей співпраці, включаючи прогалини в можливостях підприємств; та недоліки системи підтримки в логістиці та людському капіталі.

Спираючись на теорію глобальних ланцюгів створення вартості та міжнародні підходи до «зелених» бар'єрів і цифрової трансформації, у дослідженні запропоновано комплексні заходи протидії. До них належать підвищення конкурентоспроможності промисловості за рахунок кластерів високодохідної продукції, поглиблення моделей співпраці через консолідацію підприємств та цифрову простежуваність, а також вдосконалення систем підтримки шляхом розвитку логістики холодового ланцюга та інноваційних фінансових продуктів. Дослідження робить кілька оригінальних внесків, надаючи систематичну діагностику відкриття сільського господарства провінції Ляонін через призму модернізації ланцюгів створення вартості. Воно інтегрує міжнародні перспективи щодо нових викликів та посилює мікрорівневий аналіз обмежень для підприємств. Зрештою, дослідження доходить висновку, що досягнення високоякісного відкриття сільського господарства вимагає скоординованих зусиль для перетворення регіональних переваг на стійку міжнародну стратегію, що сприятиме як академічному розумінню, так і розробці практичної політики для відродження провінції Ляонін.

Ключові слова: ініціатива «Пояс і шлях», провінція Ляонін, відкритість сільського господарства, глобальні ланцюги вартості, експортна конкурентоспроможність, міжнародне співробітництво, регіональний розвиток, дослідження змішаними методами.

JEL Classification: Q11; Q13; Q17; Q18.

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