MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY NATIONAL AGRARIAN UNIVERSITY

Manuscript

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UDC: 338:631:005.4

DISSERTATION

THE THEORY AND METHOD PRINCIPLE OF LOGISTICS MANAGEMENT IN AGRICULTURAL ENTERPRISES

Specialty 073– Management

07 – Management and administration

Submitted for a scientific degree of Doctor of philosophy (PhD)

The dissertation contains the results of own research.
The use of ideas, results and texts of other authors have references

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Sumy-2023

ABSTRACT

Qiu Hongzhou. The theory and method principle of logistics management in agricultural enterprises. - Manuscript.

Thesis for the degree of Doctor of Philosophy in specialty 073 - Management. - Sumy National Agrarian University, Sumy, 2023

This dissertation proved that the modern management of agricultural logistics is a scientific management of logistics activities in agricultural process before, during and after the production of agricultural products in order to achieve the level of service and satisfaction of users with the lowest costs for agricultural logistics. Modern agricultural logistics tends to develop specialization, standardization, advanced technology, brand, intensification, coordination, and is environmentally oriented. The modern agricultural logistics industry is a complex industry formed by the industrialization of agricultural logistics resources, with the characteristics of diversified, basic, service and integration one. It was determined that each agent has its own specific subject identity, as well as thinking and a way of building the logical basis of the subject. Due to the interdisciplinary and complex characteristics of modern agricultural logistics, its research ideas and methods should embody the characteristics of universality and uniqueness.

Based on theoretical developments and practical recommendations on the application of new logistics methods and experience in the development of international agricultural logistics, an analysis of the evolution and development of Chinese agricultural logistics, the current situation in the country, and factors influencing its development was carried out. The development of the current state of agricultural logistics was analyzed in accordance with the concept of supply and demand, the construction of a modern agricultural logistics system, and the innovative component.

It was determined that at present the main types of agricultural logistics in China are self-supporting logistics mode, agricultural intermediary organization leading mode and third party agricultural logistics mode. However, most enterprises

that use self-supporting logistics mode have a low level of resource utilization, weak information flow, high logistics costs and low efficiency of agricultural logistics. Most intermediary organizations are lagging behind, their legal status is unclear, and they cannot undertake the organization and management of agricultural logistics activities.

Based on theoretical studies, it was concluded that “green” logistics can be a promising branch of logistics. Research shows that modern agricultural logistics is to meet customer demand through the use of information technology, the use of modern means of logistics, agricultural production facilities and the content of agricultural products, as well as related services, organization, control and management of all logistics activities.

Most of the intermediary organizations are lagging behind, their legal status is not clear, and they cannot undertake the organization and management activities of agricultural logistics. The number of third-party agricultural logistics enterprises is small, the scale is small, the management level is low, the information system and network construction is backward, can only provide simple services, the lack of value-added services, almost do not have the ability to coordinate, organize and manage agricultural logistics. At the same time, the current mode of logistics management is multi-stage, decentralized. Under the current development mode of agricultural logistics, the relationship between economic development and agricultural logistics, consumption life and agricultural logistics is one-way, which has caused serious damage to the ecological environment.

Studies show that the current situation of agricultural logistics development indicates the relationship between economic development and agricultural logistics. Under the current development mode of agricultural logistics, the relationship between economic development and agricultural logistics, consumption life and agricultural logistics is one-way, which has caused serious damage to the ecological environment.

The dissertation summarizes the best practices of developed countries and regions in order to substantiate proposals for creating an agricultural logistics model

for China. In accordance with the composition of the basic model of agricultural products competitiveness, taking into account logistics, a system of indicators for assessment of the competitiveness of logistics enterprises of agricultural products was built, which is based on the principles of scientificity, systematicity, expediency and combination of quantitative and qualitative. According to the components of the core competitiveness of agricultural logistics companies, it is emphasized that the core competitiveness of an agricultural logistics company should be evaluated from service division, innovation, marketing activities, managerial and cultural components. The work developed a set of five primary indices and 22 secondary indicators of the evaluation system.

In the course of the study, the methodology for assessing the country's innovative potential was improved by regrouping the innovation-related GCI sub-index and introduction of additional indicators of risk-taking (RTC) and use of disruptive ideas (DCI) by firms. This made it possible to develop a seven-parameter evaluation system to gain insight into the factors that further develop the innovative potential of certain countries. Leaders and outsiders were identified, and the standard basis of the innovative potential of these countries made it possible to group them at several levels. The innovation potential (IP) score is highly correlated with the GCI. On the other hand, it provides new ideas for further strategic design to achieve a balance between the vectors of innovation potential. Proposals are presented for further strategic design in order to achieve a balance between carriers of innovative potential, taking into account logistical approaches.

The analysis of economically developed countries such as North America, Western Europe, and East Asia was carried out in terms of the current state of agricultural products logistics. The organization of logistics as means of management, logistic facilities and their technical level were investigated. A comparative analysis of logistics systems was carried out, which made it possible to outline ways to improve agricultural logistics for China.

The leading country with high logistics potential (the United States) was 0.83 C. A standard basis was established to evaluate the logistic potential of major

agricultural producing countries in the world in six grade systems with 0.1 c. U level. According to the logistics potential of major agricultural producing countries in the world, the ways to improve the international level of agricultural enterprises and the efficiency of business process were found out. The main manifestations are: the change of production vector, the reversal of investment, the integration and BPM of agricultural producers, and the formation of special economic zones. In terms of further research, theoretical and methodological work needs to be influenced by external (macroeconomic, geopolitical, external cooperation) and internal economic factors (national development, investment, innovation, Labour resources) in the logistics management of agricultural producing countries.

Finally, the direction and path of China's agricultural products circulation system optimization were elaborated, pointing out that the optimization of China's agricultural products circulation system should comply with the principle of voluntariness, interest coordination and systematicness, the optimization goal is to improve the operation efficiency of China's agricultural products circulation system, increase farmers' income, ensure food safety of residents, Implementation mechanism is the price of agricultural products circulation system optimization mechanism, competition mechanism, information mechanism and management mechanism, the mechanism from both inside and outside two aspects of function, improving the efficiency of the agricultural product circulation system in our country, the specific path of optimization is to develop the agricultural professional cooperatives, vigorously develop cold chain logistics, third party logistics mode and the promotion of farmers and circulation.

It is proven that the level of modernization of the agricultural logistics system largely depends on the macro- and micro- policy of the government, since agriculture is a basic industry and the governments of many countries attach great importance to the role of policy and regulation in the production and circulation of agricultural products. Such influence is manifested through policy elements and the development of special laws and regulations to regulate the circulation of agricultural products, ensure smooth, flexible and efficient effective functioning, and increase the

efficiency of agricultural trade. Currently, China regulates the circulation of agricultural products, but needs support and adoption of relevant legislation. At the same time, there are certain shortcomings, such as: imperfect subject legal regulatory framework; inadequate protection of intellectual property in agriculture; chaotic planning and a certain degree of inconsistency in the market for the circulation of agricultural products. Therefore, in our opinion, it is urgent to introduce legislative changes, integrate existing laws and regulations, and create a favorable environment for the development of China's agricultural logistics industry.

The main elements of construction and optimization of agricultural logistics system were analyzed. Through the capital operation, the mode of joint operation, stock participation, holding and reorganization is adopted to realize the merger of enterprises, give full play to the integration advantages, and improve the core competitiveness and anti-risk ability of enterprises.

By means of a comparative analysis of the logistics management of agricultural production enterprises of the world, positive and negative factors affecting the development of production were identified, and the logistics potential of the main agricultural countries of the world was assessed.

Ways to optimize the logistics system of China's agricultural products were developed, as well as the principles were specified that should be adhered to by the optimization of the logistics system of China's agricultural products to increase its efficiency, and specific ways to optimize the logistics circulation were outlined.

Auxiliary elements of building an optimized logistics system for agricultural products were analyzed. In terms of organizational elements, the development and expansion of grain logistics organizations should first deepen the reform of the former state-owned grain enterprises, take the core enterprises as the center, establish grain enterprise groups, and make the enterprises bigger and stronger. Because the competition between enterprises is ultimately manifested as cost competition, and the significance of scale economy is to reduce costs and improve labor productivity through scale production. Without a certain scale, enterprises are difficult to withstand the impact of market wind and waves. Secondly, through capital operation,

adopt the mode of joint management, equity participation, holding and restructuring, achieve combination of enterprise, has the strong market development ability, processing ability, the ability to store safeguards and industry linkage ability for purchase and sale of food enterprise group company, through the enterprise group company of food enterprise assets and resources integration, unified planning and coordination of the enterprise, Add the purchase, sales, food, and stock management chain link together again, giving full play to the advantages of integral, organized to carry out the grain circulation, formed on the basis of high quality food production base, which is based on farmers, to enterprises, in the grain and oil processing group operation mode, improve enterprise core competitiveness and risk resistance. Farmers are the main body of agricultural and sideline product logistics, and the reality proves that farmers' market transaction costs are high. Domestic and international practice has proved that it is difficult to realize the connection between the scattered farmers and the large market and circulation at home and abroad, and the reasonable interests of farmers are difficult to be guaranteed. Therefore, it is necessary to set up peasant cooperative economic organizations on the basis of farmers' willingness, organize scattered and small-scale peasant households, improve the exchange conditions of agricultural products, form agglomeration economy of scale and obtain economic benefits of scale. At present, the organizational form of "company and peasant household" is widely adopted in China. Practice has also proved that in the case of opportunistic behavior on both sides, the pattern of "company and farmer" is difficult to achieve a win-win outcome. To improve the level of farmers organization, this paper puts forward the following measures: 1. to develop the farmer cooperative marketing organization, organize farmers to enter the market, to solve a production and business operation activities of the information asymmetry, to enter the market, the risk is big, product distribution links, the cost is high, resulting in increasing the income of farmers increase no problem; 2. There are mainly two modes to cultivate and develop agricultural products logistics intermediary organizations representing farmers' interests :(1) company + agricultural cooperative + peasant household model; (2) "company + association + peasant household" organizational model. The

government plays a very important role in the development and expansion of the logistics industry. The main role of the government is to take policy measures to guide and promote the development of domestic logistics and strengthen the macro-guidance and regulation of logistics development. Our government should strengthen the following functions in the development of agricultural products logistics industry: first, do a good job in the unified planning of agricultural products circulation facilities to prevent repeated construction; second, encourage multi-channel social funds to invest in the construction of the circulation system of agricultural products; third, continue to implement the policy of bank loans and fiscal interest discount; fourth, increase the government's direct investment and support; fifth, expand the opening of circulation facilities to the outside world; sixth, rectify the wholesale market transport link charges.

Keywords: logistics, logistic management, logistics activities, logistics flows, logistics infrastructure, logistics management, logistics system, management of flows, activation of logistics activities, agricultural production, competitive environment, components of marketing mechanism, flow thinking, marketing concept, storage, supply, transportation costs

Цю Хунчжоу. Теоретико-методичні засади логістичного управління в роботі сільськогосподарських підприємств. - Кваліфікаційна наукова праця на правах рукопису. – Рукопис.

Дисертація на здобуття наукового ступеня доктора філософії (PhD) за спеціальністю 073 − Менеджмент. − Сумський національний аграрний університет, м. Суми, 2023.

В дисертаційній роботі доведено, що сучасне управління логістикою сільського господарства – це наукове управління логістичними діями в процесі сільського господарства до, під час і після виробництва сільськогосподарської продукції з метою досягнення рівня обслуговування, задоволення користувачів з найнижчими витратами на логістику сільського господарства. Сучасна

сільськогосподарська логістика має тенденцію розвитку спеціалізації, стандартизації, передових технологій, бренду, інтенсифікації, координації та орієнтована на екологію. Сучасна сільськогосподарська логістична галузь – це комплексна галузь, утворена шляхом індустріалізації сільськогосподарських логістичних ресурсів, яка має характеристики багатогалузевої, базової, сервісної та інтеграційної. Визначено, що кожен суб'єкт має свою специфічну суб'єктну особистість, а також мислення та спосіб побудови логічної основи суб'єкта. Завдяки міждисциплінарним та комплексним характеристикам сучасної сільськогосподарської логістики, її дослідницькі ідеї та методи повинні втілювати в собі характеристики універсальності та унікальності.

На основі теоретичних розробок і практичних рекомендацій з застосування нових методів логістики та досвіду розвитку міжнародної сільськогосподарської логістики проведено аналіз еволюції та розвитку китайської сільськогосподарської логістики, поточної ситуації в країні, факторів впливу на її розвиток. Проаналізовано розвиток сучасного стану сільськогосподарської логістики відповідно до концепції попиту та пропозиції, будівництва сучасної сільськогосподарської логістичної системи, інноваційної складової.

Визначено, що на даний момент основними видами сільськогосподарської логістики в Китаї є самоокупний режим логістики, режим провідної сільськогосподарської посередницької організації та режим сільськогосподарської логістики третьої сторони. Проте переважна більшість підприємств, які використовують самоокупний режим логістики, мають низький рівень використання ресурсів, слабий потік інформації, високі логістичні витрати та низьку ефективність логістики сільського господарства. Більшість посередницьких організацій відстають, їхній правовий статус неясний, і вони не можуть взяти на себе організацію та управління діяльністю сільськогосподарської логістики.

На основі теоретичних досліджень зроблено висновок, що перспективною галуззю логістики може виступати «зелена» логістика. Дослідження показують,

що сучасна сільськогосподарська логістика полягає в тому, щоб задовольнити попит клієнтів шляхом використання інформаційних технологій, використанням сучасних засобів логістики, засобів сільськогосподарського виробництва та змісту сільськогосподарської продукції, а також пов'язаних послуг, організації, контролю та управління всієї логістичної діяльності. Більшість посередницьких організацій відстають, їхній правовий статус незрозумілий, і вони не можуть взяти на себе організацію та управління агрологістики.

Кількість сторонніх сільськогосподарських логістичних підприємств невелика, масштаб невеликий, рівень управління низький, інформаційна система та побудова мережі відсталі, можуть надавати лише прості послуги, відсутність послуг з доданою вартістю, майже не мають здатності координувати, організовувати та управляти сільськогосподарською логістикою. При цьому існуючий режим управління логістикою є багатоступеневим, децентралізованим. За нинішнього режиму розвитку сільськогосподарської логістики взаємозв'язок між економічним розвитком і сільськогосподарською логістикою, споживчим життям і сільськогосподарською логістикою є одностороннім, що завдало серйозної шкоди екологічному середовищу.

Дослідження свідчать, що поточна ситуація розвитку сільськогосподарської логістики вказує на взаємозв'язок між економічним розвитком і сільськогосподарською логістикою.

В дисертаційній роботі узагальнено передовий досвід розвинених країн і регіонів, з метою обґрунтування пропозицій для створення моделі логістики сільськогосподарської продукції для Китаю. Відповідно до складу базової моделі конкурентоспроможності сільськогосподарської продукції з врахуванням логістики побудована система показників оцінки конкурентоспроможності логістичних підприємств сільськогосподарської продукції яка ґрунтується на принципах науковості, системності, доцільності та поєднання кількісного та якісного. Відповідно до компонентів основної конкурентоспроможності логістичних підприємств сільськогосподарської

продукції, наголошується на тому, що основна конкурентоспроможність логістичного підприємства сільськогосподарської продукції повинна бути оцінена від служби обслуговування, інновацій, маркетингових заходів, управлінської та культурної складової. В роботі розроблено набір із п'яти первинних індексів і 22 вторинних індикаторів системи оцінювання.

В процесі дослідження було вдосконалено методологію оцінки інноваційного потенціалу країни за рахунок перегрупування субіндексу пов'язаного з інноваціями індексу глобальної конкурентоспроможності (GCI), запровадження додаткових індикаторів прийняття ризику (RTC) і використання фірмами проривних ідей (DCI).

Це дозволило розробити семипараметричну систему оцінювання, для того щоб отримати уявлення про фактори, які далі розвивають інноваційний потенціал певних країн. Визначено лідерів і аутсайдерів, а стандартна основа інноваційного потенціалу цих країн дозволила згрупувати їх на кількох рівнях. Оцінка інноваційного потенціалу (IP) сильно корелює з GCI. З іншого боку, це дає нові ідеї для подальшого стратегічного проектування для досягнення балансу між векторами інноваційного потенціалу. Надані пропозиції щодо подальшого стратегічного проектування з метою досягнення балансу між носіями інноваційного потенціалу з врахуванням логістичних підходів.

Проведено аналіз економічно розвинених країн, таких як Північна Америка, Західна Європа, Східна Азія, з точки зору сучасного стану логістики сільськогосподарської продукції. Досліджено організацію логістики як способу управління; логістичні засоби та їх технічний рівень. Виконано порівняльний аналіз логістичних систем, що дало змогу окреслити шляхи вдосконалення сільськогосподарської логістики для Китаю.

Виходячи з логістичного потенціалу основних сільськогосподарських країн-виробників світу, визначено шляхи підвищення міжнародного рівня сільськогосподарських підприємств та ефективності бізнес-процесів. Основними проявами є: зміна вектора виробництва, зворотне інвестування, інтеграція та управління бізнес-процесами (BPM) сільськогосподарських

товаровиробників, формування спеціальних економічних зон. З точки зору подальших досліджень, теоретико-методологічна робота потребує впливу зовнішніх (макроекономічних, геополітичних, зовнішньої кооперації) та внутрішніх економічних факторів (національний розвиток, інвестиції, інновації, трудові ресурси) в управлінні логістикою країн-виробників сільськогосподарської продукції.

Нарешті, було розроблено напрям та шлях оптимізації системи обігу сільськогосподарської продукції Китаю, вказуючи на те, що оптимізація системи обігу сільськогосподарської продукції Китаю має відповідати принципу добровільності, координації інтересів та системності, метою оптимізації є підвищення ефективності роботи системи обороту сільськогосподарської продукції Китаю, збільшення доходів фермерів, забезпечення продовольчої безпеки мешканців. Механізм реалізації - це ціна механізму оптимізації системи обігу сільськогосподарської продукції, механізму конкуренції, інформаційного механізму та механізму управління, механізму як зсередини, так і зовні двох аспектів функціонування, підвищення ефективності системи обігу сільськогосподарської продукції в нашій країні, конкретний шлях оптимізації полягає у розвитку сільськогосподарських професійних кооперативів, енергійному розвитку логістики холодового ланцюга, режимі сторонньої логістики та сприянні фермерам і обігу.

Доведено, що рівень модернізації системи логістики сільськогосподарської продукції значною мірою залежить від макро- та мікро-політики уряду, тому що сільське господарство є базовою галуззю і уряди багатьох країн надають важливого значення ролі політики та регулювання у виробництві та обігу сільськогосподарської продукції. Такий вплив проявляється через елементи політики та розробку спеціальних законів і нормативно-правових актів для регулювання обігу сільськогосподарської продукції, забезпечення злагодженого, гнучкого та ефективного функціонування, підвищення ефективності торгівлі сільськогосподарською продукцією. В даний час Китай регулює обіг сільськогосподарської продукції,

але потребує підтримки та прийняття відповідних законодавчих актив. У той же час існують певні недоліки, такі як: недосконала суб'єктна правова база; неналежний захист прав інтелектуальної власності в сільському господарстві; хаотичне планування та певний ступінь неузгодженості на ринку обігу сільськогосподарської продукції. Тому на нашу думку необхідно терміново запровадити зміни в законодавстві, інтегрувати існуючі закони та нормативні акти та створити сприятливе середовище для розвитку логістичної індустрії сільськогосподарської продукції Китаю.

Проаналізовано основні елементи побудови та оптимізації логістичної системи сільськогосподарської продукції. Завдяки операціям з капіталом, режим спільної діяльності, участь в акціонерному капіталі, холдинг та реорганізація приймається для реалізації злиття підприємств, повного використання переваг інтеграції та покращення основної конкурентоспроможності та здатності підприємств протистояти ризикам.

Шляхом порівняльного аналізу логістичного менеджменту сільськогосподарських виробничих підприємств світу визначеною позитивні та негативні чинники, що впливають на розвиток виробництва продукції, та оцінено логістичний потенціал основних сільськогосподарських країн світу.

Розроблено шляхи оптимізації логістичної системи сільськогосподарської продукції Китаю, а також вказано на принципи, яких повинна дотримуватися оптимізація системи логістики сільськогосподарської продукції Китаю для підвищення її ефективності, накреслено конкретні шляхи оптимізації логістичного обігу.

Проаналізовано допоміжні елементи побудови оптимізованої системи логістики сільськогосподарської продукції.

З точки зору організаційних елементів, розвиток і розширення організацій зернової логістики має спочатку поглибити реформу колишніх державних зернових підприємств, взяти основні підприємства як центр, створити групи зернових підприємств і зробити підприємства більшими та сильнішими. Оскільки конкуренція між підприємствами зрештою проявляється як

конкуренція витрат, а значення ефекту масштабу полягає в зниженні витрат і підвищенні продуктивності праці за рахунок масштабного виробництва. Без певного масштабу підприємствам складно протистояти впливу ринкового вітру та хвиль. По-друге, за рахунок операцій з капіталом прийняти режим спільного управління, участі в акціонерному капіталі, холдингу та реструктуризації, домогтися об'єднання підприємств, мати сильну здатність до розвитку ринку, здатність до переробки, здатність зберігати гарантії та можливість галузевого зв'язку для купівлі та продажу групи харчових підприємств, через компанію групи підприємств з інтеграції активів та ресурсів харчового підприємства, єдине планування та координація підприємства.

Об’єднавши ланки ланцюга закупівель, продажів, продовольства та управління запасами, повною мірою використовуючи переваги інтегральної організації, створеної для здійснення обігу зерна, сформованого на основі високоякісної харчової виробничої бази, яка ґрунтується на фермерах, для підприємств, у режимі роботи групи з переробки зерна та олії, покращити основну конкурентоспроможність підприємства та стійкість до ризиків. Фермери є основною частиною логістики сільськогосподарської та побічної продукції, і реальність доводить, що ринкові транзакційні витрати фермерів є високими. Вітчизняна та міжнародна практика довели, що важко реалізувати зв'язок між розрізненими фермерами та великим ринком та обігом усередині країни та за кордоном, а розумні інтереси фермерів важко гарантувати. Тому необхідно створювати селянські кооперативні господарські організації на основі бажання фермерів, організовувати розрізнені та дрібні селянські господарства, покращувати умови обміну сільськогосподарською продукцією, формувати агломераційну економіку масштабу та отримувати економічні вигоди від масштабу виробництва.

В даний час у Китаї поширена організаційна форма «товариство і селянське господарство». Практика також довела, що у випадку опортуністичної поведінки з обох сторін для схеми «компанія та фермер»

складно досягти безпрограшного результату. Для покращення рівня організації фермерів у цій роботі пропонуються такі заходи:

Розвинути маркетингову організацію фермерського кооперативу, організувати фермерів для виходу на ринок, вирішити виробничу та бізнес-операційну діяльність інформаційної асиметрії, вийти на ринок; ризик великий, ланки розподілу продукції, вартість висока, в результаті у збільшенні доходів фермерів збільшення не проблема;

Існують головним чином два способи вирощування та розвитку логістичних посередницьких організацій сільськогосподарської продукції, які представляють інтереси фермерів: (1) компанія + сільськогосподарський кооператив + модель селянського домогосподарства; (2) організаційна модель «підприємство + асоціація + селянське господарство». Уряд відіграє дуже важливу роль у розвитку та розширенні логістичної галузі.

Основна роль уряду полягає у вжитті політичних заходів для спрямування та сприяння розвитку внутрішньої логістики, а також у посиленні макрокерівництва та регулювання розвитку логістики. Наш уряд має посилити такі функції у розвитку галузі логістики сільськогосподарської продукції: по-перше, добре попрацювати над уніфікованим плануванням об’єктів для обігу сільськогосподарської продукції, щоб запобігти їх повторному будівництву; по-друге, заохочувати багатоканальні соціальні фонди інвестувати в будівництво системи обігу сільськогосподарської продукції; по-третє, продовжувати впроваджувати політику банківських кредитів та фіскальних відсоткових знижок; по-четверте, збільшити прямі державні інвестиції та підтримку уряду; по-п'яте, розширити доступ до засобів обігу для зовнішнього світу; по-шосте, виправити транспортні витрати оптового ринку.

Ключові слова: логістика, логістичний менеджмент, логістична діяльність, логістичні потоки, логістична інфраструктура, управління логістикою, система логістики, управління потоками, активізація логістичної діяльності, сільськогосподарське виробництво, конкурентне середовище,

складові маркетингового механізму, валовий внутрішній продукт, концепція маркетингу, зберігання, постачання, транспортні витрати.

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INTRODUCTION

Relevance of the topic. The urgency of the research topic lies in the need to form a perfect logistics management theory and method in the work of agricultural enterprises, which is caused by internal and external factors. The work of agricultural companies was adversely affected. These factors include: lack of liquid assets, low qualifications, low wage levels, risks of an economic and environmental nature, and inadequate logistics management systems in the agricultural sector. External factors adversely affecting agribusiness operations should note the instability of the political situation in the country, the evolution of military operations in the east into a War of Invasion by Russia, the inflation process, limited investment and the low level of eu subsidies to agribusiness. Domestic agricultural producers. These circumstances have led to the need to form better theories and methods of logistics flow management in the work of agricultural enterprises, whose purpose is to increase the economic potential of the work of agricultural enterprises and improve the competitiveness of agricultural products in domestic and foreign markets. Therefore, the urgency of this article is indisputable.

Connection of work with scientific programs, plans, and topics. The dissertation work was carried out in accordance with the research plan of the Sumy National Agrarian University on the topic: "Organization and economics aspects to foreign economic activity agrarian enterprises of One Belt And One Road ", within the framework of which the author investigated the basic principles of logistics in agricultural enterprises.

The purpose and objectives of the work. is to improve theoretical and methodological principles and provide practical suggestions for the operation of agricultural logistics enterprises.

The implementation of the research goal led to the setting and solving of **tasks:**

- from the aspects of agricultural enterprise logistics supply management, to think about the premise of forming effective logistics in the work of agricultural enterprises;

-explore and improve modern logistics management concepts, management theories and principles, aiming to form the theoretical basis of logistics management;

- improve the theoretical principles of logistics management in the work of agricultural enterprises by forming new characteristics of logistics management classification;

- improving organizational and economic support for logistics management in agricultural enterprise activities;

- formulating orderly regulations on the evaluation of logistics potential of agricultural enterprises;

- develop a systematic methodology to estimate the economic benefits of agribusiness logistics management;

- give full play to the logistics potential of agricultural enterprises at the application level;

- evaluate the application level of economic benefits of agricultural enterprise logistics management;

- optimize logistics management in agricultural enterprises.

The object of the research is the process of logistics management in agricultural enterprise activities.

The subject of the research aims to improve the theory and method of logistics management in the work of agricultural enterprises, so as to improve their work efficiency.

Applicant's personal contribution. The dissertation is an independently performed scientific work. All the results of the study, presented in the paper and presented for defense, are received by the author personally.

Research methods. The research methods include: comparative methods - determining the main indicators of economic activities of agricultural enterprises over the years; Economic Statistical Method -- Study on statistical data of work in agricultural enterprises; Factor Analysis method -- the study of the impact on the work of agricultural enterprises, and the systematic analysis method of improving the classification characteristics of logistics management. To form a structural approach

to the organization and economic provision of logistics management in the work of agricultural enterprises; To develop economic and mathematical methods for systematic evaluation of logistics potential of agricultural enterprises -- to improve the economic analysis methods and expert estimation methods for the evaluation of economic benefits of logistics management of agricultural enterprises; Economic modeling method in the agricultural enterprise activity logistics system management optimization model development stage.

The information base is the achievements of relevant legislation and legal documents, international agreements, official materials of statistical departments of China and Ukraine, official documents of international organizations and scientific papers. The author's monographs, regular scientific literature, Internet resources, financial statements of agricultural enterprises and other information sources.

The scientific novelty of the obtained results. The most important result of the novelty of the research obtained by the authors is that the theoretical and methodological provisions of logistics management in the work of agricultural enterprises will be improved:

First received:

- developed an evaluation method for logistics potential of agricultural enterprises, which contains fuzzy logic elements and forms an effective management decision-making standard for logistics system level;

Improved:

- provisions on methods for evaluating the economic benefits of logistics management in agricultural enterprises, different from existing provisions, including the formation of quantitative and qualitative indicators of logistics management to determine its level of efficiency;

- organize and provide logistics management in the activities of agricultural companies. Different from the existing activities, it includes: subsystems describing the current situation of logistics management and identifying problems; Existing business process standardization subsystem of logistics activities; In the operation of logistics management to introduce new elements of the subsystem; Logistics

management efficiency economic monitoring subsystem; Logistics management economic risk detection subsystem of agricultural enterprise logistics strategic solution formation subsystem;

Acquired further development:

- the theoretical provisions of agricultural enterprise logistics management are different from the existing theoretical provisions, including the new classification signs of agricultural enterprise logistics management;

- economic modeling of logistics management business process in the work of agricultural enterprises. In sharp contrast to it, the existing management chooses the direction of logistics management so as to obtain effective logistics management type enterprises in agricultural work

- the concept of logistics management in the work of agricultural enterprises is different from the existing concept, which contains a set of management theory, principles, in order to form the theoretical basis of agricultural logistics management company.

The scientific and practical significance of this dissertation is to improve the theory and method of logistics management in agricultural enterprises. Solve the problem of working efficiency of agricultural logistics enterprises.

Personal contribution of the acquirer. A dissertation is a completed scientific study. Scientific statements, conclusions and recommendations are the result of personal scientific research. Published scientific works are independent developments and reflect the main content of the dissertation.

Approbation of the results of the dissertation. The main provisions and results of the dissertation research were made public by the author at conferences, seminars, meetings, among which the most important were «Modern problems of management of businesses: theorism and practice» (18-19 March, 2019, Kharkov, Ukraine); «III International Scientific-Practical Conference "Management Of The XXI Century: Globalization Challenges», (23-24 April, 2019, Poltava, Ukraine); «The 19th International Scientific and Practical Conferences», (19-21 April, 2019, Odessa, Ukraine); «XVI (XXVIII) International Scientific and Practical conference»,

(12-13 March 2020, Kyiv, Ukraine); 13th international conference for young scientists and students «innovational processes of economic, social, and cultural development: domestic and foreign experiences», (April 01–02, 2020, Ternopil, Ukraine); «II International scientific-practical conference "modernization of economy: current realities, forecast scenarios and development prospects"», (28th of April, 2020, Kherson, Ukraine); XVII international scientific and practical conference of young scientists «economic and social development of Ukraine in the XXI century: the national vision and the challenges of globalization» (14-15 may, 2020, ternopil, Ukraine); «Sumy State University Oleg Balatskyi Academic and Research Institute of Finance, Economics and Management. socio-economic challenges proceedings of the International Scientific and Practical Conference», (3-4 November, 2020, Sumy, Ukraine); «2020 International Scientific-Practical Conference (IEEE)», (6-9 October, 2020, Kharkiv, Ukraine); «Modern tendencies of students' foreign language training in the multicultural academic environment», (17 April, 2021, sumy, Ukraine); II International Scientific and Practical Conference, (21 May, 2021, Sumy, Ukraine).

Publications. Based on the results of the conducted research, the author has published 14 scientific works.

Structure and scope of work. The main part of the dissertation consists of an introduction, three chapters and conclusions, the volume of 204 pages of computer text and contains 21 tables, 7 figures.

SECTION 1

THEORETICAL ASPECTS OF LOGISTIC MANAGEMENT IN THE ACTIVITY OF AGRICULTURAL ENTERPRISES

1.1 The economic essence of managing the material support of agricultural enterprises and methodical approaches to conducting research

Modern agricultural product logistics' development is conducive to modern agricultural product circulation system's establishment and the realization of product circulation value of agriculture. Modern logistics has become the "third profit source" apart from improving labor productivity and reducing material consumption. Products' of agriculture logistics can reduce the logistics cost and increase products' of agriculture added value through the packaging, later processing, distribution and transportation of products of agriculture, so as to improve products' of agriculture profits, increase income of farmers and promote development of agriculture.

China is a big agricultural production country, and enterprises' of agriculture logistics plays an important role in national economy's development. By establishing a modern agricultural product circulation system, the contradiction between regional blockade and gap in product of agriculture gradually and studying enterprises' of agriculture logistics circulation will be therefore effectively solved, and the contradiction between product structure and market demand of agriculture, circulation speed and benefit will be analyzed, thus promoting products' of agriculture circulation in China, improving products' of agriculture international competitiveness greatly in China, and laying a solid foundation for solving the "three rural" problems fundamentally.

At present, the logistics industry in China has entered a stage of rapid development gradually. However, due to the relatively backward agricultural development in China, products logistics' of agriculture development seriously lags behind, which not only greatly weakens the competitiveness of China products of

agriculture market, but also becomes the whole circulation system's bottleneck in China. According to statistics, the loss rate of agricultural and sideline products such as fruits and vegetables in China is about 26%-30% in logistics links such as picking, transportation and storage. More than a quarter of products of agriculture are consumed in logistics links, while the loss rate of fruits and vegetables in developed countries is controlled below 6%. The loss rate of fruits and vegetables in the United States is only 1-2%. Modern agricultural products enterprises have products logistics' of agriculture poor awareness, and many of them care about production only but don't care about logistics. Logistics management's level is poor, logistics technology is backward, and logistics efficiency is low. Products' of agriculture third-party logistics develops slowly, many of which are just the renaming of the lack and the original subject of special assets, which affects products logistics' of agriculture development greatly. Facing foreign high-quality agricultural products' competition and the competition of developed agricultural products logistics, China agricultural products market is facing great challenges.

Li Yining, a famous economist, put that forward "today, we must develop advantageous agriculture, increase income of farmers, establish logistics concept and develop product logistics industry of agriculture". Ding Junfa, executive vice president of Logistics' China Federation and Purchasing, believes that products logistics' of agriculture development can not only make any products that are produced by farmers realize their value and use value, but also increase products' of agriculture value in the logistics process, reduce the cost of production and circulation of agriculture, and improve production's of agriculture overall efficiency. He also believes that product logistics of agriculture of China has the characteristics of large quantity, variety and difficulty of product logistics of agriculture. Product logistics' of agriculture characteristics require full attention to value-added logistics of agricultural product that processes, full attention to cultivating logistics subject in farmers, and full attention to cultivating logistics carrier in rural and urban construction. It therefore is of great significance to strengthen the research on enterprises' of agriculture logistics.

At present, the research on agricultural product logistics in China has just started, and product logistics of agriculture have been studied by a lot of experts from different angles. But altogether, the study in this area is still decrepit, and further research is required. Based on the supply chain theory and modern logistics, learning from developed countries' experience and combining the characteristics of economic development of agriculture of China, how to explore the development of enterprise logistics of agriculture of China, study the development countermeasures of enterprise logistics of agriculture of China and improve the logistics efficiency of enterprises of agriculture of China, such research has important practical and theoretical significance at present.

Logistics is of neat importance in economic development. Peter Drucker, a renowned American trade scientist, compared logistics to "virtuous land". Douglas Lambert Dao pointed out that warehouse cost is the largest part of logistics activities' total cost (Chen Liuqin, 2002). The book circulation cost that is written by Waseda's Professor Nishida University calls logistics system's improvement the "third profit source" to be tapped. In the book Logistics Wars in Major Communities, he enlarged on that "the prevailing logistics costs are like icebergs, most of which are likely seabed, so it can be seen that the price is only a small part of the water side" (Bowersox D.J, 1996)

Since the beginning of this century, many scientific research institutes and enterprises have actively carried out research work in various fields of logistics, and relevant experts have carried out relevant research from the perspective of their own research. For example, Zhu Daoli, Wang Zhitai, Wang Yyaoqiu and others have carried out research work on logistics technology and logistics management and obtained relevant research results. From economics Angle for studying the logistics is very much also, such as Jiang Jian think that modern logistics industry is a new economic growth point of modern logistics industry in China is power source of economy growth (Zhou Bushou, Zhang Zhen. et al., 2004) will have a new growth of Chinese national economy, stimulating and supporting role, the development of relevant industries of our country play a role to promote and coordinate, to solve the

difficult problem in the development of our country's economy play a key role; Li Xuewei et al. studied the characteristics of logistics and believed that the characteristics of logistics have the characteristics of service industry, integration, and indivisibility with production and operation. From the perspective of market supply and demand operation, Du Muhengba analyzed the basic characteristics and development trend of modern logistics based on economic theories such as demand view, transaction cost and cost finding. Based on the wealth view of economics, this thesis expounds the basic driving factors to promote the development of modern logistics, and then discusses the transformation of modern logistics business form and logistics operation mode. Miao Qing, Bai Ling and Qu Pengfei believe that the development of modern logistics industry is of great significance to the development of regional economy, the adjustment of industrial and economic structure and the cultivation of a new round of economic growth points. They put forward that according to Peru's concept of "economic space" growth pole, modern logistics belongs to the propelling economic sector, so it is necessary to establish modern logistics in line with the regional growth model, and that industrial clusters are conducive to the development of modern logistics. Logistics transaction nature's selection theory has been studied by Li Xuewei, Zeng Jianping, Lu Bo and others and economics is cost by transaction mode from transaction's perspective. (He Yunfeng et al., 2003) studied the foreign logistics mode, especially the American logistics mode. Cao Hongrui and Wang Ling analyzed economic globalization's influence on logistics organization in China from three aspects: market structure, enterprise behavior and market performance of logistics industry in China, from the perspectives of entry of China into China logistics market and entry of multinational logistics companies into China logistics market.

Liu Yanli studied the evolution of logistics and the choice of enterprise logistics mode. Liu Yanping applied transaction cost theory and the analysis method of enterprise boundary theory to deeply study the boundary problem of logistics outsourcing, analyzed the theoretical basis of the rapid development of third-party

logistics, and discussed how to use the boundary thought of logistics outsourcing to solve relevant practical problems.

A lot of scholars have begun to pay attention to products' in recent years of agriculture logistics. Arlo Biere believes that trade logistics of agriculture is a separate course in trade courses of agriculture. The importance of supply chain management and logistics makes it very important. He has designed this purpose the teaching syllabus. Liu Weifang and Li Xuegong believe that products' of agriculture marketing needs to introduce modern logistics thoughts. Products' of agriculture marketing is not a simple summary of production, preliminary processing, storage, warehousing and transportation, but needs to be solved with the help of its supply chain thoughts and modern logistics. The relationship between logistics and (Wang Xinli, 2000) industrialization and of agriculture believed that one of the important reasons for the slow development of agricultural industrialization in China was that he neglected logistics' of agriculture role in industrialization's of agriculture process and the backwardness of Chinese agricultural logistics system. Fu Honglei and Yi Xiuqin believed that the industrialization of agriculture called for the infiltration of logistics industry into rural areas and accelerated the development of rural logistics. Wang Jing believes that developing agricultural products logistics is the way to achieve agricultural modernization. The particularity of products production and circulation of agriculture determines that products of agriculture need modern logistics. Lehn, Ddong-Ying Liu from the analysis of the logistics of agricultural products is different from industrial products, reveals the characteristics of logistics include system of meaning, and then for the fresh agricultural products logistics system as an example, analyses its system structure and making potential profit from the exteriority of change, pointed out that system innovation to promote the evolution of Chinese agricultural products logistics system.

From specific research's perspective, Yu Kui-Sheng introduced the wholesale market and logistics of products of agriculture in Japan. Taking Chengdu as an example, Liu Xuexue and Qin Ruide analyzed product logistics' of agriculture existing problems at present, and put some countermeasures forward to speed product

logistics industry's of agriculture development up and improve competitiveness of agriculture. Wang Ya believes that after accession of China to WTO, it needs to further open the domestic grain market, integrate into the multinational grain market as soon as possible, and appreciate trade liberalization. It therefore is necessary to adjust the current grain industry policy and speed grain logistics' scientific construction up. （Zhao Min, 2007）The key to realizing scientific grain logistics is to optimize and adjust the grain economic structure, rationalize the grain flow direction and improve the regional production and marketing balance mechanism by means of macro-control and market mechanism. Xia Wenhui studied the operation mode of agricultural products logistics under the e-commerce platform. Alan McKinnon analyzed the transportation efficiency of the British food supply chain, etc. (Benjamin S. Blanchard, 1992) Products logistics system's of agriculture vertical integration was studied by Li Yanjun and Sun Jian between intermediaries and producers, the supply chain of pork supply chain was investigated by Chen Chao from pork supply's perspective chain, and Jiangsu Pork supply's cooperative relationship chain was studied by Dai Yingchun. Zhang Qian studied the development mode of agricultural products logistics in Jianghan Plain. Hu Zhenhu studied the development mode of agricultural logistics industry. Oleksandr Velychko from the Angle of the agricultural industry logistics management at the same time, put forward agricultural industry logistics management should through the materials of agriculture chain distribution management and management, industrialization management and of agriculture to develop products logistics management of agriculture, (Oleksandr Velychko,.et al. 2016) puts forward the class in our country agricultural logistics operation mode of agricultural materials enterprise chain operation mode, order pattern, the industrialization of agricultural production, agricultural products wholesale. Zhao Liming and Xu Qingqing designed Chinese regional agricultural logistics system, set the function of regional modern logistics information platform, and further studied the industrial chain structure of large agricultural logistics. Fang Jingke analyzed the current situation and development

direction of fresh supply chain in China. Li Jian studied the logistics of fresh agricultural products in Hebei province.

From the enterprise standpoint, Xie Peixiu suggested that speeding logistics of agriculture up requires converting state-owned grain companies with a contemporary business system, fostering multiple ownership of cultivating, building modern logistics enterprises and agricultural logistics enterprises, ameliorating the distribution pattern and organization of products of agriculture in co-operation with regional distributors, and marketing and establishing an operational system for food security on the basis of modern logistics.(Gao Hui,.et al. 2009). A preliminary study was conducted by He Feng on the development trend and basic situation of Chinese agribusinesses' supply chain practices, taking the first batch of leading processing enterprises of agriculture in China as the target (He Feng, 2009) and Five significant driving forces and usual mechanisms of supply chain practice in companies of agriculture are emphatically analyzed. Zhang Zongcheng suggested that the grain distribution industry ought to restructure its properties, expand its roles, and develop itself into distribution center and a modern logistics center (Zhang Zongcheng, 2007). Alan McKinnon's research shows that logistics capabilities have a positive impact on supply chain performance of agriculture, and that firms' external and internal integration are highly correlated (Alan McKinnon, 2003). The findings also suggest that external and internal integration have a positive impact on performance and corporate logistics capabilities. On the effect of supermarkets on the distribution of agricultural goods in China. Leonid M. Taranik proposed rules and methods of business operations' economic re-engineering.(Leonid M. Taraniuk, 2008) Hu Dinghuan et al. suggest that guiding supermarket companies can follow Chinese agricultural supply-side farmers' model to guide thousands of little farmers into the supermarket supply chain and speed up the pace of popularization of high-quality agricultural goods and safe (Hu Dinghuan, 2002) Vorley thinks that centralized purchasing of agricultural goods by supermarket chains with hundreds of shops not only diminishes controlling costs, but also improves bargaining power and control in the upstream of the supply chain.

From the above analysis, the study on logistics in China is building up in depth and the study on logistics of agriculture is issuing. Due to logistics research's of agriculture complexity, the practical and theoretical research on logistics of agriculture is relatively poor and needs to be further systematized. Logistics of agriculture is a hot spot of study at present, but the prevailing research is comparatively dispersed. From enterprise research's perspective, the comprehensive research on logistics of agriculture is weak in both empirical and theoretical analysis, and needs to be studied in depth.

In this thesis, through the development of logistics theory and logistics of agriculture of agriculture, the prevailing situation of foreign and domestic research on logistics of agriculture of China, analysis of the future space of logistics development of agriculture of China, on this basis, from China's leading industrialized companies, supermarket chains, third-party logistics of agricultural goods for empirical research, the problems in the study, and put policy recommendations and countermeasures forward for the development of logistics of agriculture of China.

This thesis holds that agricultural products logistics can be divided into agricultural leading enterprise logistics, supermarket chain agricultural products logistics and agricultural products third-party logistics from the perspective of enterprises. Agriculture leading enterprise logistics research can be summarized and wholesale markets for agricultural products logistics research agricultural products processing enterprises, covering agricultural products purchasing, processing, wholesale sales, supermarket chain logistics of agricultural products is the main focus on retail distribution logistics of agricultural products, while the third party logistics enterprise covers the entire agricultural product logistics link. On this basis, the research scope of this paper is as follows:

- theoretical research on the logistics of agricultural products:
- development of agricultural products logistics in developed countries:
- to study the development status of agricultural products logistics in China:
- to study the development space of agricultural products logistics in China
- research on logistics development of agricultural enterprises in China;

- research on logistics of leading agricultural industrialization enterprises;
- research on agricultural products logistics of chain supermarkets;
- research on the development of agricultural products third-party logistics;
- put forward countermeasures for the development of agricultural products logistics in China, and put forward corresponding policy suggestions.

In terms of research methods, this paper adopts the method of combining qualitative and quantitative, normative and empirical analysis. Through literature review, the logistics and supply chain theory, circulation theory, agricultural products logistics and supply chain management of agricultural products and other related theories are deeply studied, and the development of agricultural products logistics in developed countries and its reference significance to the development of agricultural products logistics in China are analyzed. (Vorley Nikolaevich Dudin, 2015) on the basis of analysis of agricultural products logistics development in our country, adopt the method of case analysis and questionnaire investigation on our country agricultural industrialization leading products' of agriculture enterprises, products logistics of agriculture related enterprises of products' of agriculture third-party logistics, supermarket chain, agricultural products logistics activities as empirical analysis' main research object, based on this, advances some countermeasures for developing the product logistics of agriculture in our policy Suggestions and country. The precise way is as follows:

- theoretical analysis. Through reading relevant literature, make full use of relevant economic management theory, analyze products logistics' of agriculture development;
- questionnaire survey. Through the questionnaire's scientific design, on the basis of the per-survey, questionnaire survey of leading enterprises of agriculture, third-party logistics and other enterprises, so as to obtain relevant first-hand data for the study;
- case analysis. Select typical instances to compensate for data fault and confirm related theories;

- study the relation between relevant variables applying quantitative economic analysis manners such as uncorrelated regression;
- comparative study. Through the summary of foreign agricultural products' development logistics and the development of Chinese agricultural products logistics research, looking for Chinese agricultural products logistics development countermeasures.
- data principally comes from the China agricultural yearbook since 2000, China statistical yearbook, China logistics yearbook "national agricultural goods cost mileage compilation of the national agricultural prices survey yearbook, part from the national agency of statistics (NBS) and data, Henan province's bureau, Xinxiang agency website statistics;
- a questionnaire survey was carried out on the logistics of agricultural goods companies of leading industrialization enterprises of agriculture in Henan province, and 217 enterprises of leading provincial and national companies in Henan province were selected as the survey samples for family questionnaire survey;
- take Xinxiang market as an example to conduct in-depth interview and questionnaire survey on products' of agriculture third-party logistics;
- investigation is cased by conduct on chain supermarkets to obtain relevant data;
- journals and dissertations over the years. Second hand data were obtained from related magazines, China journal network and excellent master and doctoral dissertation database of the school library and reference room.

This paper will produce relevant theories and literature reviews, study domestic and foreign agricultural product logistics, and analyze the development space of agricultural product logistics in China. On this basis, it will conduct empirical research from the perspective of agricultural product logistics enterprises in China: logistics research of leading agricultural enterprises, supermarket chains, product logistics and product logistics development of agriculture of agriculture. Finally, it

will put some countermeasures forward for developing product logistics of agriculture in China.

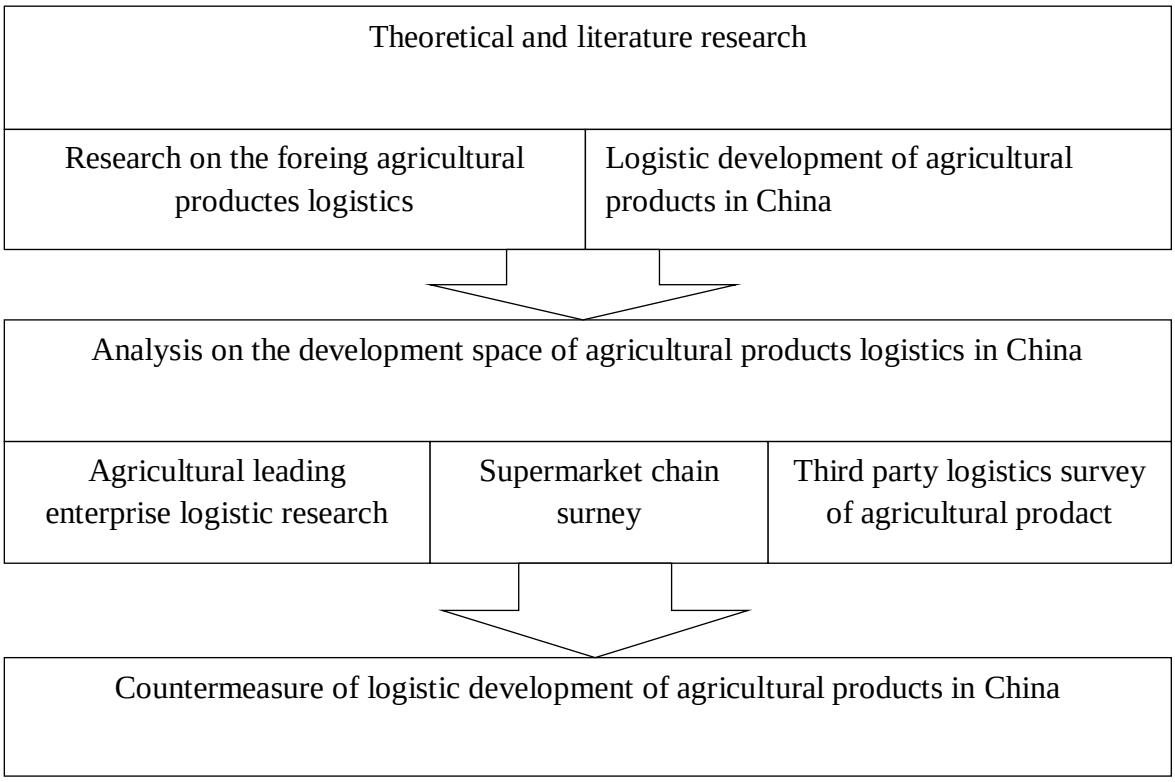

Figure 1.1 - Agricultural logistics theory and literature development in China

Source: developed by the author.

Compared to similar studies, this paper may be innovative in the following facets:

- products logistics' of agriculture relevant theories are summarized, and products logistics' of agriculture theoretical basis is comprehensively summarized.
- this thesis studies products logistics' of agriculture development from enterprises' perspective, and conducts empirical research on leading enterprises' of agriculture, chain supermarkets and agricultural products third-party logistics by means of in-depth interview and field questionnaire survey.

Due to the limitation of time and data, this study still needs to be further improved. Product logistics' of agriculture research is a new topic, because it involves a wide range of fields, due to my lack of ability and experience, may affect the

research, besides, because a lot of data involves business secrets, so the data are not obtainable, can be used for research only, the research may lack of detailed and comprehensive.

1.2 Components of material support of agricultural enterprises, elements and classification

The word logistics originated from the United States in 1901, J.F. Growell, an American, first recognized the cost factors affecting the distribution of agricultural products, which opened the prelude to human understanding of logistics. In 1916, L.D.H. Hold discussed in "Marketing of Farm Products" that the effects of marketing include the concepts of time effect, place effect, ownership effect and marketing channel, thus confirming the important role of time value and place value of logistics in creating the market value of products. In 1927, logistics was first used to define logistics in the Age of Distribution. In April 1962, management guru Peter Drucker published an article in Fortune titled «The Dark Continent of the Modern Economy». From now on marks the official launch of enterprise logistics management. In 1963, the United States established the Logistics Management Association, which promoted the development of the logistics industry. In the 1950s and 1960s, Japan introduced the concept of logistics from the United States. Logistics can be defined from different angles. The most widely used definition in the world is that of American Logistics Association. "Logistics is the whole process of planning, implementing and controlling the effective flow and storage of raw materials, intermediate inventory, final products and related information from the place of origin to the point of consumption to meet the needs of consumers." The concept of supply chain was introduced into the definition of logistics in 1998. In 2001, the American Logistics Management Association improved the definition of logistics: "Logistics is the planning, implementation and control of high-efficiency and low-cost forward and reverse flow and storage between the output and sales of goods, services and related information in the process of supply chain operation, in order to meet customer

requirements". In the national standard of logistics terms officially implemented in China on August 1st, 2001, "logistics" is defined as "the physical flow process of goods from the place of supply to the place of acceptance". According to the actual needs, the basic functions of transportation, warehousing, loading and unloading, handling, packaging, distribution processing, distribution and information processing will be organically combined". From the above point of view, the definition and understanding of logistics is actually a deepening process.

Combining with the above definition, we believe that modern logistics is to satisfy customer demand as the goal, supported by information technology, the use of modern means of logistics, for the realization of goods, services and related information, from the source to consumption source of high efficiency, high benefit of bidirectional flow organization, process control and management of the economic activity, is part of the supply chain process.

We can understand the connotation of modern logistics from the following aspects:

- in modern logistics, "thing" refers to all material materials that can be physically moved in real life, including raw materials, semi-finished products, finished products, services, information and wastes. "Flow" refers to all physical movement, which covers not only the field of commodity circulation, but also the field of commodity production and consumption;
- modern logistics activities include procurement, quality inspection, warehouse inventory, storage, classification, inventory, packaging, handling, loading and unloading, transportation, information communication, customer service, sales forecasting, order processing, cost management and a series of activities involving the process of goods from the place of raw materials to the final consumer;
- in the era of economic globalization and information, modern logistics is a concept of integration, systematization, networking and comprehensive integration, and has become a cross-sector, cross-industry and cross-regional social system;

- modern logistics not only pursues economic goals to achieve the effective allocation of resources in the whole society and the whole world, but also pursues social goals to reduce pollution, protect the environment and achieve sustainable economic and social development.

Modern agricultural logistics refers to the organization, control and management of agricultural production materials, agricultural products, related services and information, from supply source to consumption source, and other economic activities, which are aimed at meeting customer needs, supported by information technology and using modern logistics means. It is an important part of logistics in the whole society.

Differences between modern agricultural logistics and agricultural products circulation:

- modern agricultural logistics is different from the circulation of agricultural products. From the perspective of industry, agricultural logistics is the name of a service industry. The core activity of modern agricultural logistics is to complete the time and space transfer of agricultural materials and agricultural products;
- different scope of coverage. Economic activities usually include production, circulation and consumption activities, and agricultural product circulation process includes agricultural product commercial flow and logistics;
- different profit sources. The profit of the circulation of agricultural products comes from the price difference of agricultural products, while the profit source of modern agricultural logistics is diversified, including the price difference of agricultural production materials and agricultural products, as well as the value-added generated by the packaging and processing activities of logistics links (Wang Xiaoli, 2018).

Differences between modern agricultural logistics and traditional agricultural logistics:

- richer connotation;
- different management concepts and modes;

- different technological content;
- different service levels;
- different degrees of socialization.

From a realistic point of view, to realize the specific functions of use value, modern agricultural logistics should divide its specific functions into four types:

- realize the use value of agricultural economy;
- value-added functions;
- functions to enhance competitiveness;
- regulating function.

Agricultural production is different from industry and service industry. In the process of production and circulation, agricultural products are obviously dependent on natural forces, natural conditions and individual life. Agricultural products are often fresh and active. At the same time, agricultural products, especially fresh agricultural products, are the necessities of people's life, with a small elasticity of consumption and the characteristics of universality, regularity and diversity of demand. Due to the characteristics of agricultural production and consumption of agricultural products, agricultural logistics is different from industrial logistics and has the following prominent characteristics:

- agricultural logistics involves many points, a wide range and a large quantity;
- agricultural logistics is independent and exclusive;
- agricultural logistics has non-equilibrium (Marx. Das, 1990);
- value preservation and processing value-added are important contents of agricultural logistics;
- agricultural logistics pays more attention to the stability of relations;
- agricultural logistics has great risks;

Elements and classification of modern agricultural logistics flow factors:

- fluid. Fluid is the "thing" in agricultural logistics, that is, agricultural means of production and agricultural products, with natural and social attributes;
- the carrier. The carrier refers to the facilities and equipment by which the fluid

of agricultural logistics flows;

- direction. Flow direction refers to the flow direction of agricultural logistics from the starting point to the ending point;
- the traffic. Flow is the size of agricultural logistics;
- process. Process refers to the actual process of agricultural logistics fluid from the starting point to the ending point. The flow elements of modern agricultural logistics are strongly interrelated and interdependent.

Functional elements refer to the basic capabilities of modern agricultural logistics system. These basic capabilities, combined together effectively, form the overall function of modern agricultural logistics, so as to reasonably and effectively achieve the ultimate economic and social benefits of agricultural logistics. Due to the timeliness of agricultural means of production and fresh and perishable agricultural products, higher requirements are put on agricultural logistics functional elements in terms of freshness preservation, effectiveness, safety and cleanliness.

The establishment and operation of modern agricultural logistics need many supporting means, especially in the complex social and economic system. To determine the status of agricultural logistics system and coordinate the relationship with other systems, these elements are essential. Supporting elements mainly include:

- hardware elements. Including agricultural logistics facilities, agricultural logistics equipment, agricultural logistics tools and information equipment and network;
- software elements. It includes organization and management, systems and systems, laws and regulations, administrative orders, standardization systems, science and technology, etc.

According to different fluid objects, it can be divided into:

1. Logistics of agricultural means of production. It is the logistics formed by the production, storage, transportation, distribution, distribution and self-information activities of the necessary means of production in the process of agricultural production. It involves the production and logistics planning of agricultural materials and agricultural machinery and tools such as seedlings, feeds, fertilizers, mulching,

pesticides, veterinary drugs and fuels, the use of agricultural means of production and market information services.

2. Agricultural products logistics. It takes agricultural products as the logistics formed by the object. According to the classification of agricultural products, it includes grain crop logistics, cash crop logistics, livestock products logistics, aquatic products logistics, forest products logistics and other agricultural products logistics.

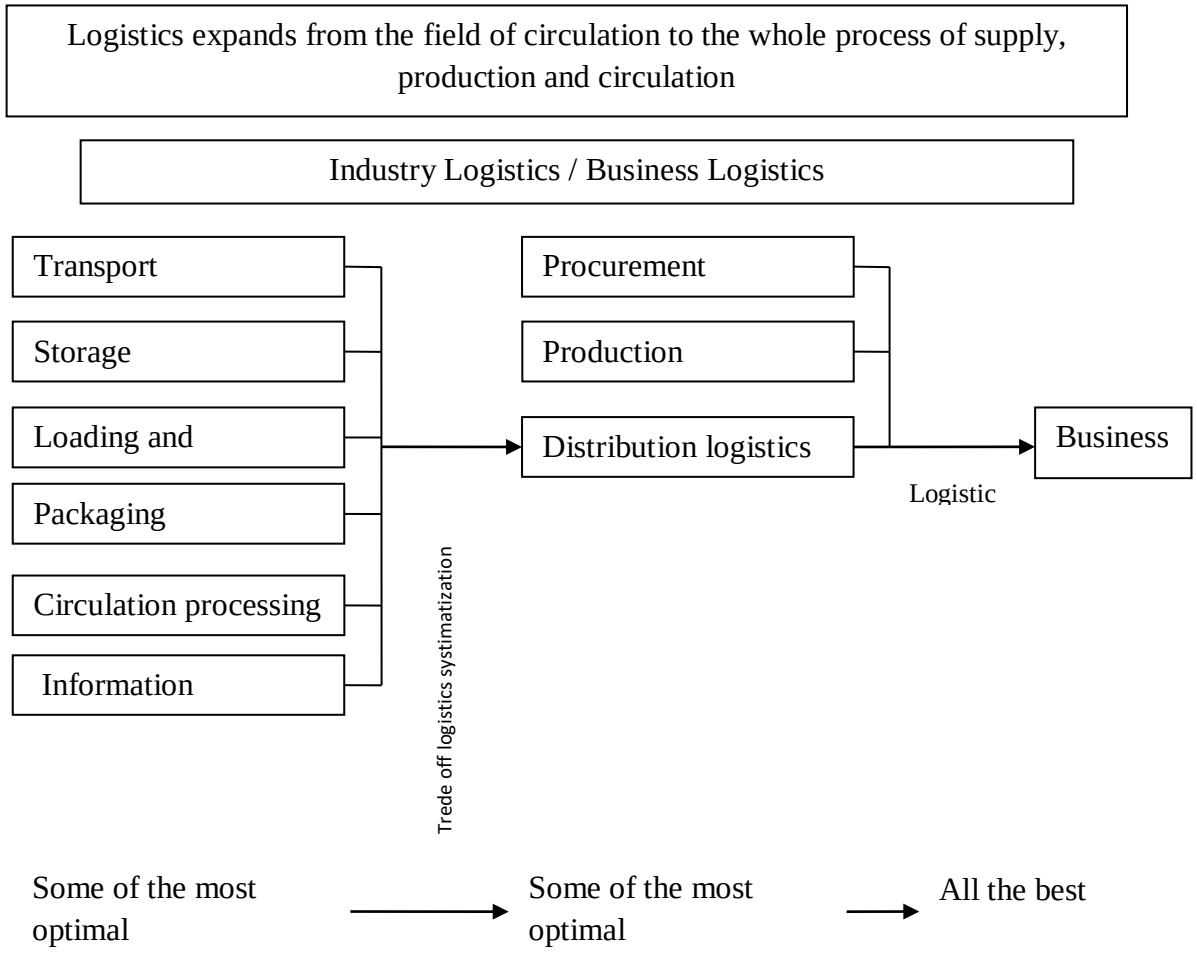

Figure 1.2 - Logistics expands from the field of circulation to the whole process of supply, production and circulation

Sourse: developed by the autor

According to the main stages and material transformation of agricultural production process, it can be divided into:

1) agricultural supply logistics. Agricultural supply logistics is the logistics formed in the process of supplying and supplementing agricultural production materials in order to ensure the uninterrupted agricultural production and guarantee the development of rural economy.
2) agricultural production logistics. Agricultural production logistics refers to the logistics formed by the allocation, application and management of production factors in the process from agricultural planting and breeding activities and management to the output and harvest of agricultural products.
3) sales logistics of agriculture. Sales logistics of agriculture is connected with the logistics activities transferring products' of agriculture ownership to consumers through acquisition, processing, preservation, packaging, storage, transport, distribution and sales.
4) recycling and waste logistics of agriculture. In the supply of production's agricultural means, production of agriculture, consumption and circulation of products of agriculture, it will lead to a large number of wastes' generation inevitably, recyclable and useless, and the logistics activities formed in their transportation, loading and unloading and processing are recycling and waste logistics of agriculture.

1.3 Modern trends in the material supply of agricultural enterprises and construction of supply chains

Modern agricultural logistics management is the logistics activities' scientific management in the three stages of production, post-production and agricultural pre-production, namely the upstream, the middle and the downstream, so as to achieve the satisfactory service level with the lowest agricultural logistics cost. Modern agricultural logistics management's main contents are:

– logistics operation management. It mainly includes the transportation management, storage management, packaging management, loading and unloading management, circulation and processing management, and

distribution management of agricultural production means and agricultural products. Logistics operation management constitutes the foundation of modern agricultural logistics management. Other levels of logistics management, such as service management and quality management, are all extensions of operation management;

- logistics cost management. The cost of agricultural logistics is mainly reflected in the expenditure of each link of agricultural logistics activities. Strengthening the management of logistics costs is of great significance to reduce the cost of logistics and improve the economic benefits of logistics activities;
- logistics service management. Modern logistics emphasizes service function, modern logistics management takes customer satisfaction as the first goal, logistics service management has become an important content of modern logistics management. The essence of agricultural logistics service is to satisfy consumers' demand for agricultural production materials and agricultural products;
- logistics quality management. Agricultural logistics quality management is a kind of comprehensive quality management, including the management of agricultural logistics object quality, agricultural logistics means and logistics method quality, work quality and agricultural logistics service quality;
- logistics information management. Agricultural logistics information management is the process of collecting, sorting, storing, disseminating and utilizing agricultural logistics information, and at the same time, it manages various elements involved in agricultural logistics information activities, including personnel, technology and tools, so as to achieve reasonable allocation of resources.

According to different forms of logistics, from the perspective of modern supply chain management, modern agricultural logistics management is actually the management of agricultural supply logistics, agricultural production logistics, agricultural sales logistics and agricultural waste logistics.

Modern agricultural supply chain management:

- the meaning of modern agricultural supply chain management. Supply chain refers to the network chain structure formed by upstream and downstream enterprises involved in providing products or services to end-users in the process of production and circulation (Hu Jian, 2001);
- the importance of modern agricultural supply chain management. Traditional agricultural logistics management is carried out by decentralized members to manage their own logistics. Modern agricultural supply chain management transcends the traditional logistics management concept and breaks through the boundaries of individual enterprises to study the management of different entities in the supply chain, which is a new management concept and management mode (Carter, C. R. et al., 2011) (Lu Lan et al., 2012).

Green logistics mentions logistics' process to curb logistics' harm to the environment at the same time, to achieve the purification of logistics environment, logistics resources to get the most full use. Green logistics is a multi-level concept, which not only includes green logistics activities of enterprises, but also includes the regulation, control and social management of green logistics activities.

Modern agricultural green logistics is an environment-friendly agricultural logistics that takes green civilization as the direction and environmental protection as the goal, and directly or indirectly promotes pollution reduction. According to the main stages of agricultural production and material transformation, it can be divided into agricultural green supply logistics, agricultural green production logistics, agricultural green sales logistics and agricultural reverse logistics. Among them, some scholars refer to green supply logistics, green production logistics and green sales logistics as green positive logistics. (Zhang Qian, 2003)

First of all, through green design, green manufacturing and green packaging, agricultural materials manufacturers form the final green agricultural materials. Leftover materials, by-products and processing residues in the production process of agricultural materials enter the recycling waste system for reuse or waste disposal.

Secondly, Agricultural producers select green agricultural materials suppliers through evaluation of agricultural materials suppliers. The suppliers send green

agricultural materials to agricultural producers, and the returned agricultural materials will enter the recycling system and be returned to agricultural materials producers for reuse or waste treatment.

Third, agricultural producers form primary green agricultural products through green design, green production, green management and green harvest. The waste materials and wastes in the production process enter into the recycling waste system for reuse or waste disposal.

Fourth, On the one hand, some green primary agricultural products are directly supplied to consumers for consumption through green distribution channels. The packaging wastes, useless objects and returned goods generated in the distribution and consumption process enter the recycling and abandonment system for reuse or disposal. On the other hand, the agricultural product processor selects the green primary agricultural product supplier after evaluating the green primary agricultural product supplier. The supplier sends the green primary agricultural product to the agricultural product processor, and the returned agricultural product enters the recycling system and is returned to the agricultural product supplier for reuse or waste treatment.

Fifth, agricultural product processors through green design, green processing, green management, the formation of the final green processed products, the processing process of residual materials, by-products, processing residual products into the recycling waste system, reuse or waste disposal.

Sixth and Final green processed products are supplied to consumers for consumption through green distribution channels. Packaging wastes, useless objects and returned goods generated during distribution and consumption will enter the recycling and abandonment system for reuse or disposal.

Development trend of modern agricultural logistics:

- specialization trend, The specialization of modern agricultural logistics means that agriculture-related enterprises separate agricultural logistics activities from the production and operation of enterprises and hand them over to specialized third-party agricultural logistics to complete. In this way, enterprises can focus

on their main business and improve their core competitiveness. By virtue of professional logistics functions, third-party agricultural logistics can shorten the delivery time of agricultural materials and agricultural products, ensure product quality, reduce supply chain costs, alleviate traffic pressure, save resources, protect the environment and improve customer satisfaction;

- standardization trend, Modern agricultural logistics standardization is the agricultural logistics as a big system, make system internal facilities, machinery and equipment, including special tools such as technical standards, packaging, storage, loading and unloading, transportation, preservation and other kinds of standards, agricultural logistics measuring, accounting and statistical standards, and logistics information standards, formation and in line with international standards of the country's modern agricultural logistics standardization system;
- the trend of advanced technology, Advanced modern agricultural logistics technology is widely used in advanced logistics technology, information technology, such as Internet technology, satellite positioning technology, geographic information system, radio frequency identification technology, barcode technology, automated warehousing technology, intelligent transportation system, electronic identification and electronic tracking technology, preservation technology;
- branding trend, Brand is the symbol of quality and reputation. With a good brand of agricultural logistics enterprises will continue to increase social demand, market competitiveness will continue to improve. Modern agricultural logistics enterprises should take the initiative to carry out brand operation, shape their own service brands, grasp the initiative of the market, and win customers and consumers;
- trend of intensification and synergy, The intensification and synergy of modern agricultural logistics mainly reflects the integration of agricultural logistics functions, logistics channels, various modes of transportation and logistics links, as well as the merger and acquisition and cooperation between

agricultural logistics enterprises;

- greening trend, Green modern agricultural logistics is to develop green logistics, green civilization as the direction, to environmental protection as the goal, directly or indirectly contribute to the environmental protection of agricultural logistics pollution abatement. (Techane G, 2010)

Industry is the product of social division of labor and the inevitable result of the continuous development of social productive forces. Its meaning has multiple levels. With the continuous development of social productive forces, industry can be subdivided to the point where it can no longer be subdivided. Industrial economics refers to the groups of enterprises that provide similar goods or services and move on the same value chain as industries, while several enterprises that provide the same goods or services can be understood as industries.

Modern agricultural logistics industry is a compound or aggregation industry formed by the industrialization of agricultural logistics resources. Agricultural logistics resources include transportation, storage, loading and unloading, handling, packaging, circulation processing, distribution and information related to agricultural production and circulation. The industrialization of these resources has formed agriculture-related transportation industry, warehousing industry, loading and unloading industry, packaging industry, processing and distribution industry, logistics information industry and so on. Advanced agricultural logistics industry is in the national economy. It consist of some logistics economic entities, chiefly including the following degrees:

- logistics industry of agriculture. This industry consist of the intersection, node and various transportation lines of transportation lines, and tally terminals' system. It is the infrastructure that is provided the operation of logistics system and a "platform" of agriculture with as the foundation. Railway, highway, water transport, air transport, warehousing, etc. is included by its main industries. The most important logistics facilities are stations, freight yards, ports, docks, airports, railways, highways, warehouses, etc. Logistics foundation industry of agriculture is logistics industry's of agriculture most important component,

which not only directly reflects economic development level of a country, reflects strength of a country, but also other agricultural logistics industry and even other economic forms of the national economy rely on the important foundation's existence;

- logistics system industry. This industry is an organic combination of communication technology and computer system technology in logistics' of agriculture field. Information network technology is modern agricultural logistics' lifeline. Through information transmission, resources can be Shared among production materials' of agriculture suppliers, farmers and production materials of agriculture, wholesalers, retailers and final consumers of products of agriculture, and logistics' of agriculture all links can be tracked in real time, effectively controlled and managed in the whole process; (Lin Lin, 2018)
- proprietary logistics. This refers to the self-run logistics of products production enterprises of agriculture, agricultural materials production enterprises, marketing enterprises and large production, agricultural products processing enterprises and commercial enterprises, which may also be some of the industries that are engaged in third-party agricultural logistics activities. Self-run logistics focuses on the establishment of internal logistics system, which includes independent logistics enterprises that are established by circulation enterprises and agricultural production enterprises for their own business activities or production, especially distribution centers, distribution systems and circulation and processing systems. The self-run logistics industry depends on the social logistics platform partly, and for large-scale giant enterprises, their own logistics platform is often built by them;
- third-party agricultural logistics. The third party logistics industry of agriculture is an industry in which the agent shipper provides logistics' of agriculture agent service to the shipper. The third party agricultural logistics is the direction of socialized division of modern agricultural logistics and labor. The third-party agricultural logistics' agency role is all agricultural logistics activities' systematic and whole-process agency. Such agency activities need to

operate on the logistics platform, so agency activities' level depends on the logistics platform largely. Agricultural logistics consulting industry;

- the logistics consultation industry of agriculture is made for logistics service enterprises of agriculture, materials production enterprises of agriculture, farmers and agricultural production enterprises to provide logistics services institutions and enterprises, specific business including logistics business management diagnosis of agriculture, logistics of agriculture market analysis and research, the third party logistics operation mode of agriculture, logistics of agriculture park or logistics of agriculture center location selection, implementation and planning, logistics equipment of agriculture, logistics of agriculture engineering supervision, the supply chain management of agriculture process optimization, logistics operation of agriculture, logistics information technology of agriculture, agricultural logistics enterprise financial management, logistics enterprise marketing management consulting, supply chain, customs affairs Consult, etc.. Due to logistics' of agriculture characteristics, compared with general management consulting, agricultural logistics management that consults is more professional, more complex and involves a wider range. (Zhang Sihua, 2004)

Modern agricultural logistics industry has the following four characteristics:

- multitudinous. Agricultural logistics industry is a cross-industry comprehensive industry. According to the current industry standards, agricultural logistics industry involves planting and planting industry, transportation industry, warehousing industry, loading and unloading industry, packaging industry, agricultural food processing industry, distribution industry, logistics information industry, postal service industry, telecommunications industry, etc.;
- foundation. Agriculture is the basic industry of the national economy, and the modern logistics industry is also the basic industry, which determines that the modern agricultural logistics industry has the basic characteristics. Logistics infrastructure and agricultural logistics equipment running on infrastructure constitute the carrier of agricultural logistics. They are basic, especially the

logistics infrastructure, most of which is fixed on the ground, and play a decisive role in the operation of the whole agricultural logistics;

- service. The essence of modern logistics is service, and modern agricultural logistics industry is an industry providing agricultural logistics service, which belongs to the broad service industry. Agricultural logistics service operation centered on reducing the total cost of agricultural logistics is the most significant objective characteristic of agricultural logistics industry;
- cohesion. Modern agricultural logistics industry is a cross-industry, cross-sector comprehensive industry, with strong permeability is a complex industry, can also be called polymerization industry. Agricultural logistics resources and agricultural logistics operations are not simple superposition, but a kind of integration, can play a multiplier effect.

Chinese agricultural logistics encounters many problems in its development practice, and with the change of the objective environment, it also faces many competition and challenges. This requires us to combine social progress, science and technology and economic development, based on the scientific market economy theory and historical evolution logic, based on the international competitive environment, adapt to the requirements of Chinese agricultural industrialization production and operation development, change the traditional development mode, and seek a new mode suitable for the development of Chinese modern agricultural logistics. Under the guidance of the scientific concept of development, from the perspective of system theory and sustainable development, we follow the development trend of modern logistics, combined with the actual situation of China, and the development model of modern agricultural logistics An in-depth discussion is conducted.

Because the logistics channel is one of the important factors affecting the development of modern agricultural logistics. Different natural conditions, economic structure and development levels of development in various regions of China, agricultural industrialization is not long, and agricultural logistics channels also show diversified characteristics. Agricultural logistics channels can be divided into two

parts: agricultural means of production logistics channels and agricultural products logistics channels. As shown in Figure 1.3, there are three main logistics channels for agricultural means of production in China.

At present, there are six main logistics channels for agricultural products in China, as shown in Figure 1.4.

Figure 1.3 - The channels of logistics on means of agricultural production

Source: developed by the author

Agricultural producers sell their own products in the short-distance origin retail market, which is a traditional logistics channel of some agricultural products, especially fresh agricultural products:

- origin wholesale and direct selling channel. Agricultural producers sell their products to wholesalers of origin, sold directly to consumers;
- origin wholesale add sales retail channel. Agricultural producers sell their products to wholesalers of origin, which then sell them to local retailers and finally to consumers. The logistics radius of this channel has expanded significantly;
- origin wholesale + sales wholesale + sales retail channel;
- this is the main channel of agricultural logistics. In this channel, the division of labor between regions is further deepened, origin wholesalers only need to sell

products to local retailers, and the organization is the responsibility of local wholesalers. The logistics radius of this channel is large, but there are many intermediate links;

- origin wholesale + intermediate wholesaler + land wholesale + sales retail channel;
- agricultural products processing enterprise channel.

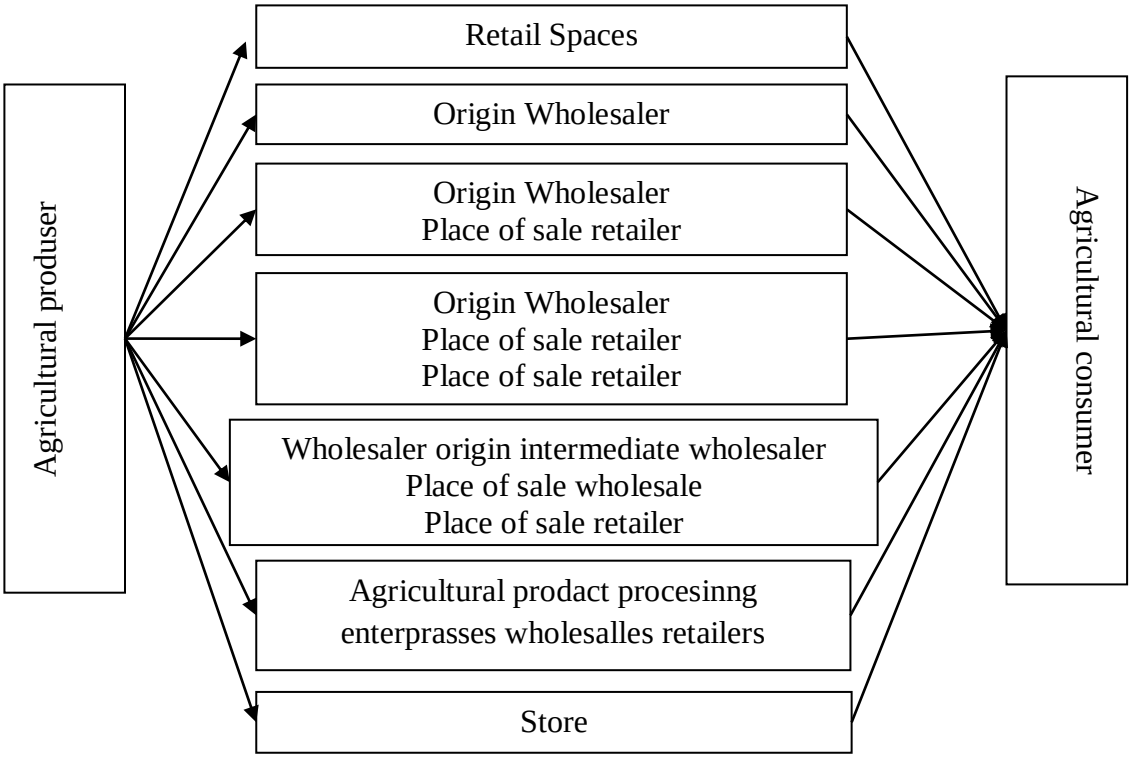

Figure 1.4 - The channels of logistics on agricultural products

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- origin wholesale + intermediate wholesaler + land wholesale + sales retail channel;
- agricultural products processing enterprise channel.

Analysis of the current agricultural logistics development mode. Since the late 1990s, with the continuous deepening of supply chain management ideas and the awareness of sustainable development, especially with the addition of WTO, the development environment of agricultural logistics in China has undergone great changes. Correspondingly, the agricultural logistics development model has also appeared some changes. Due to our vast region, different natural conditions, economic structure and development level, agricultural industry; the development time is not long, the development of agricultural logistics also presents diversified characteristics. (Lv Qinghua, 2004). There are mainly the following several agricultural logistics development modes.

Self-run logistics refers to agricultural materials producers, agricultural producers, agricultural products processors and circulation enterprises to carry out logistics business according to their own business experience and business habits. In this mode, as the main body of agricultural logistics activities, can buy warehousing services from storage enterprises, to buy transportation services, but the purchase of this service is limited to one or a series of scattered logistics functions, and has the characteristics of temporary, pure market transactions, namely the connection between logistics services and enterprise value chain is loose. Due to the different

operators of agricultural logistics, the self-operated logistics mode has various forms. Here, we focus on the plus Industrial enterprises, circulation enterprises and wholesale market leading model.

Leading mode of processing enterprises. Agricultural products processing enterprises are the leader of agricultural operation, responsible for the organizational operation of agricultural logistics. According to the different degree of farmers, it includes "processing enterprises + scattered, independent farmers", "processing enterprises + base + farmers" and " processing enterprises + association. Association + farmers "and" processing enterprises + cooperatives + farmers " four kinds.

1. "Processing enterprises + decentralized, independent farmers" mode.

In this mode, directly processing enterprises sign contracts with independent and scattered farmers to establish the relationship between the supply and marketing of products of agriculture. Farmers shall organize and arrange production activities of agriculture in accordance with the contract to sell the products of agriculture to processing enterprises; the processing enterprises shall be responsible for a series of logistics' of agriculture operations. Processing enterprises can run their own outsourcing some of the logistics business or logistics. Due to the diversified operation and frequent market fluctuations, the transaction costs of negotiation and supervision between processing scattered and small-scale farmers and enterprises, however, are high, and it is difficult to establish a mechanism of phoenix risk interest sharing and sharing, the order performance rate is low and the scale is difficult Expansion, the market competitiveness is not strong. (Zhang Weiying, 1996). Therefore, the "processing enterprise + scattered, independent farmers" model is uncommon in China.

2."Processing enterprise + base + farmers" mode. This is the basic form of the processing enterprise leading model. For example, the Delta Group's feed and poultry production, has adopted this model. In this model, processing enterprises rent the land needed to farmers through local governments, so that the base is a "workshop", and farmers become industrial workers in the "workshop". As a link in the agricultural supply chain, the processing enterprises connect the agricultural producers through

the base, and also connect with the end consumers through the agricultural wholesale and retail enterprises.

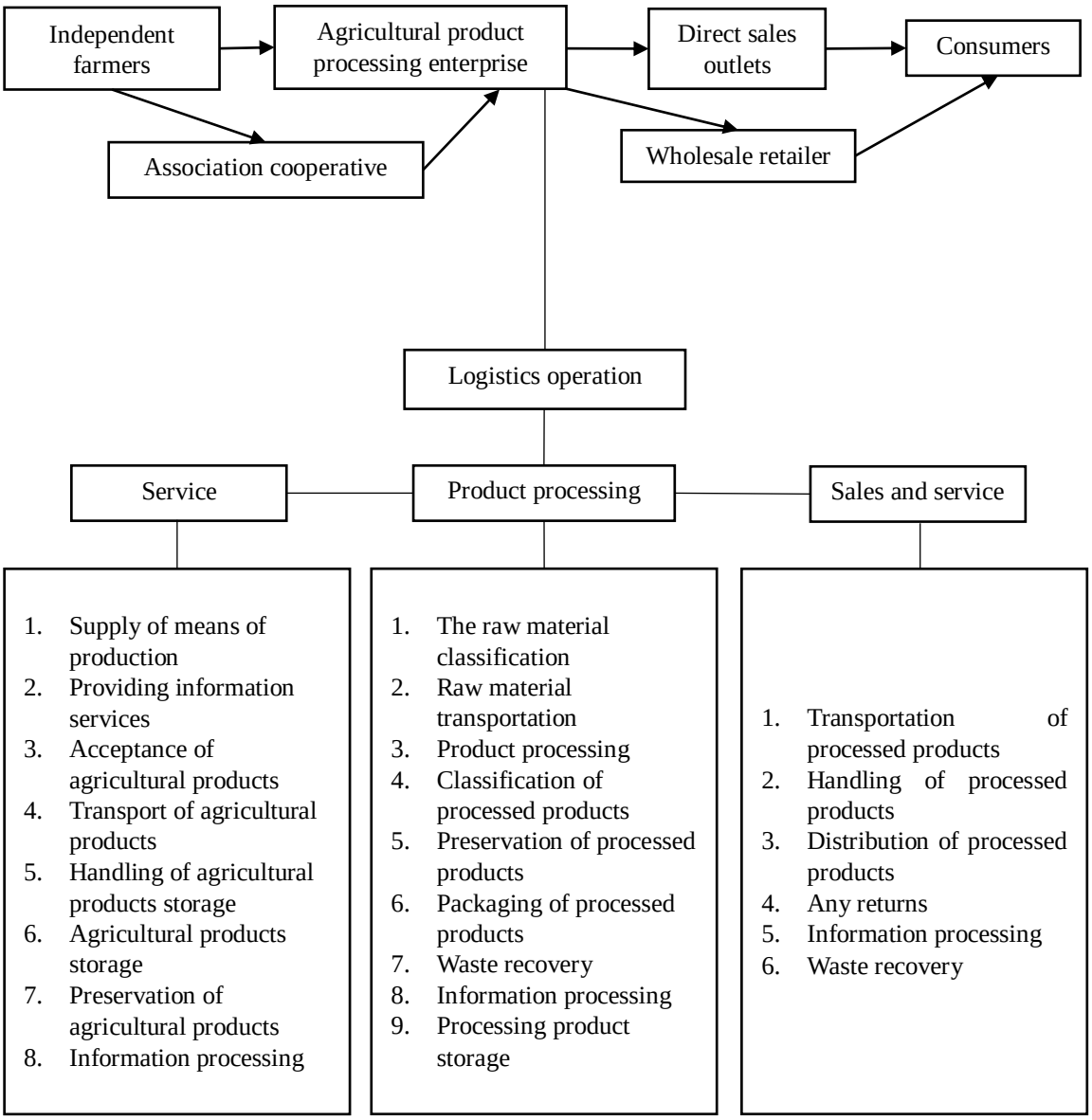

Figure 1.5 - Logistic mode with farm products processing enterprises

Source: developed by the author

Some agricultural products processing enterprises have established their own direct sales network points to sell their products directly to consumers or foreign importers. In the specific development mode, processing enterprises generally build a logistics platform, information platform and sales platform to provide technical guidance and necessary financial support for farmers. Farmers' market risk is small,

and enterprises can run their own logistics or outsource part of their logistics activities to professional logistics enterprises. To a certain extent, this mode solves the difficulties of lack of capital, technology and information in the adjustment of agricultural structure, and avoids the problems of uncoordinated market risks, technical risks in production and profit mechanism.

At the present stage, because the agricultural commodity rate in most areas of China is still relatively low, the farmers' self-organization ability is relatively weak, “processing type The enterprise + base + farmer” model has a certain rationality, which should also be advocated. However, at present, most processing enterprises have a small scale, their layout is not reasonable enough, with low management level, low processing level, and short chain, so their driving ability is weak and unable to play the leading role in agricultural logistics operation. (Yi Xiaolin, 1998)

3. "Processing enterprises + association + farmers" mode. In this mode, farmers organize through various professional and technical associations or sales, sign contracts with processing enterprises, and establish the supply and marketing relationship of agricultural products. Although in recent years, some associations after reform has played a more prominent role, but, in general, the development of all kinds of agricultural associations in China is still in its infancy, the development of many associations has strong color, low enterprise participation, service ability is weak, lack of necessary regulation, and farmers' interests are not closely related. Therefore, this model is not very popular.

4. "Processing enterprises + cooperative + peasant households" mode. In this mode, farmers organize through cooperatives and sign contracts with processing enterprises to establish the supply and marketing relationship of agricultural products. As farmers 'own organizations, cooperatives negotiate with processing enterprises on behalf of farmers, and serve farmers' production and sales of agricultural products. It has developed this model in Sichuan, Zhejiang and other places in recent years. However, due to the lagging development of farmers' professional cooperative economic organizations and their unclear legal status, it is difficult for the registration and management methods to adapt to the requirements of their market entities. The

services in technology, capital, purchase and sale, processing, storage and transportation and other links cannot effectively meet the requirements of farmers, and the role of cooperatives has not been given full play. Therefore, the popularity of this model is also relatively small.

Circulation enterprises are the leader of this model. According to the different fluid objects, this mode is divided into "circulation enterprises + agricultural material producers" and "circulation enterprises + agricultural product producers".

1. "Circulation enterprises + agricultural materials producers" mode. "Circulation enterprises + agricultural materials producers" mode, as shown in Figure 1.6.

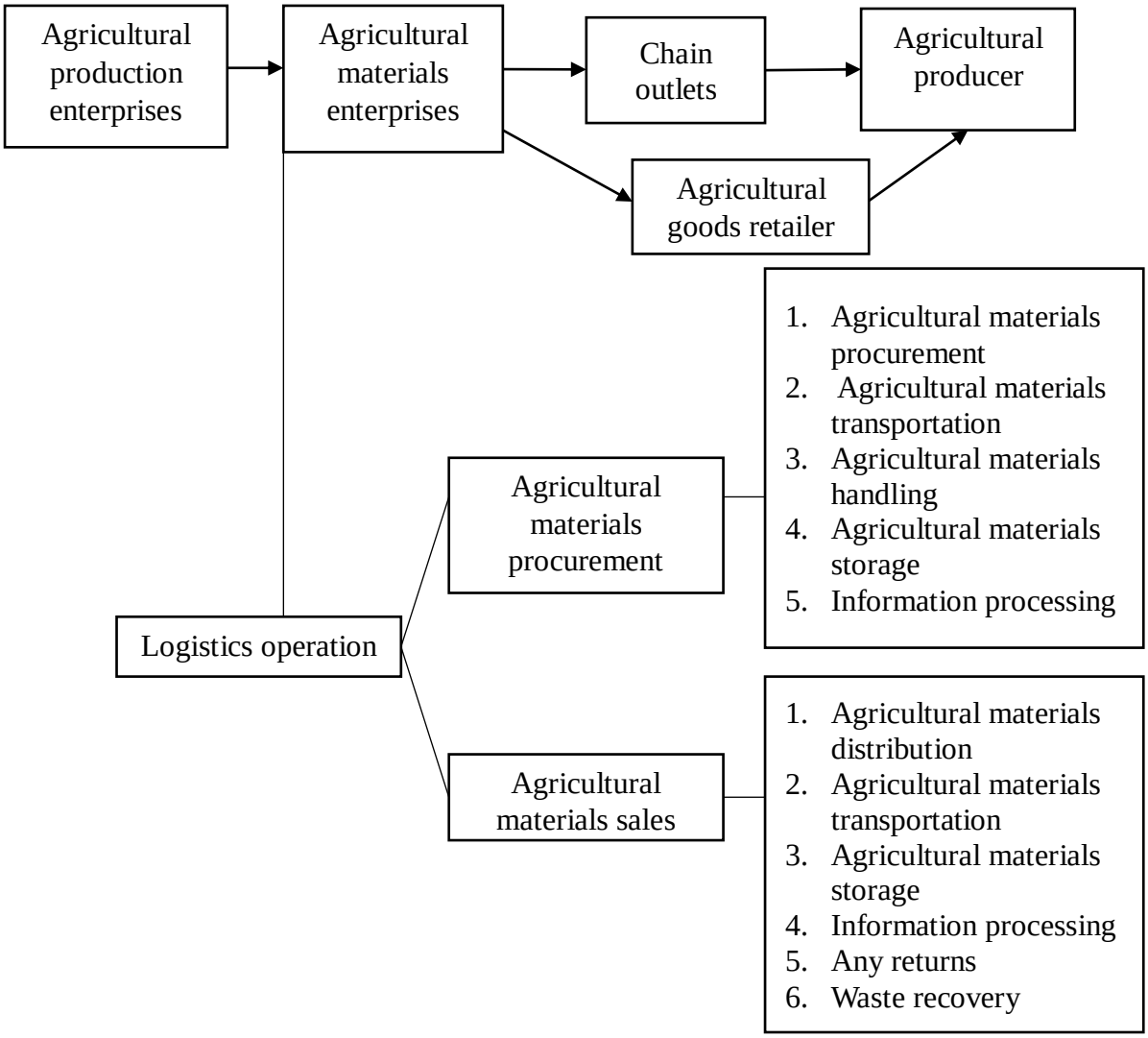

Figure 1.6 - Logistics mode with circulation enterprises and agricultural goods and materials production enterprises

Source: developed by the author

The "circulation enterprises" here mainly include agricultural materials management enterprises built by agricultural technical service departments, supply and marketing cooperatives, township enterprises involved in the circulation of agricultural materials, and some other industrial and commercial enterprises. In this operation mode, the enterprises engaged in the circulation of the agricultural materials connect the agricultural production enterprises and the agricultural producers, and sell the agricultural products to the agricultural producers through their own chain sales outlets, or through the agricultural retailers. Circulation enterprises can run their own logistics, or outsourcing part of the logistics activities to professional logistics enterprises. "Centralized procurement, unified distribution" chain business model, has developed rapidly in recent years. At present, suitable to carry out the chain operation of the product owners To include seeds (seedlings), fertilizers, pesticides, agricultural film, agricultural machinery and tools, feed and additives, etc. Agricultural materials chain management is still in the initial stage in China, and the scale and standardization level of agricultural materials chain operation is not high.

"Circulation enterprises + agricultural product producers" model. "Circulation enterprises + agricultural product producers" model, Figure 1.7.

Leading mode of wholesale market. In this model, the wholesale market of agricultural materials or agricultural products is the leading one, connecting the suppliers of agricultural materials, agricultural products production and processors, wholesalers at all levels, retailers, intermediary organizations, and other enterprises providing logistics services. According to the different fluid objects, it can be divided into two types: "agricultural materials wholesale market" mode and "agricultural products wholesale market" mode, as shown in Figures 1.3.6 and Figure 1.8.

Wholesale market is the main channel of clothing industry logistics, including the origin market and marketing market, national wholesale market and regional wholesale markets, integrated wholesale markets and professional wholesale markets.

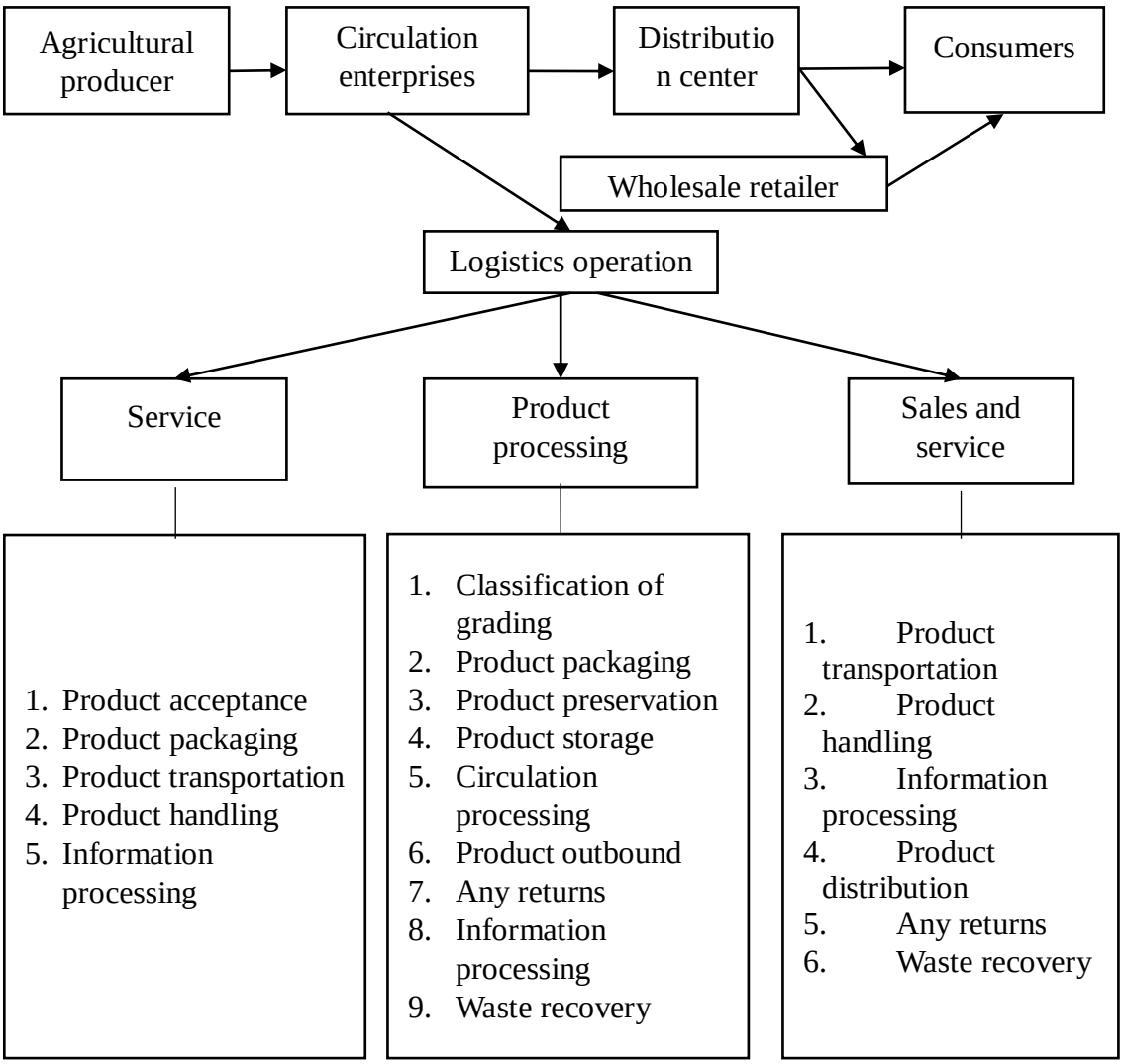

Figure 1.7 - Logistics mode with circulation enterprises and farm producers

Source: developed by the author

As the leading operation of agricultural logistics, agricultural materials and agricultural products wholesale markets are responsible for the construction of information, inspection and testing system, sales platform, logistics service system. In the process of agricultural logistics operation, the trading methods are also constantly innovating.

New methods such as agricultural products auction, broker agency and online trading have been adopted in some agricultural products wholesale markets. Some of the logistics services in this model, such as long-distance transportation, storage and

storage, can be outsourced to professional Third-party logistics enterprises to complete it. This model is the main model of the development of Chinese agricultural logistics at this stage. (Zhou Zaiqing. 1999)

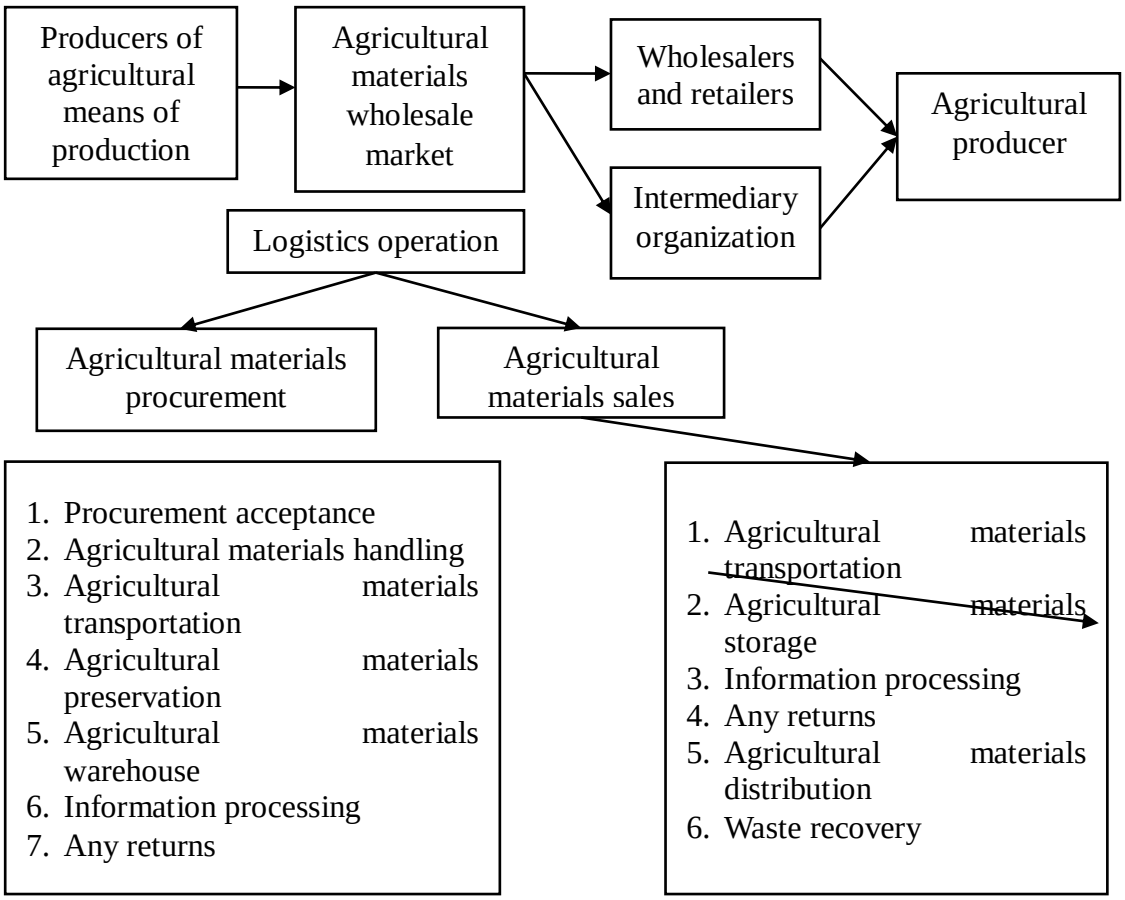

Figure 1.8 - Logistics mode with agricultural goods and materials terminal markets

Source: developed by the author

Agricultural intermediary organizations include farmers 'professional cooperatives, professional and technical associations, sales associations, and farmers' brokers. This development mode with a variety of agricultural intermediary organizations as the link, organize agricultural prenatal, prenatal and postpartum comprehensive logistics services, make many scattered small-scale agricultural producers and operators together, form a large-scale economic group, reduce

decentralized management risk, realize economy of scale, improve the market bargaining power, increase farmers' income. (Li Huimin, 2000).

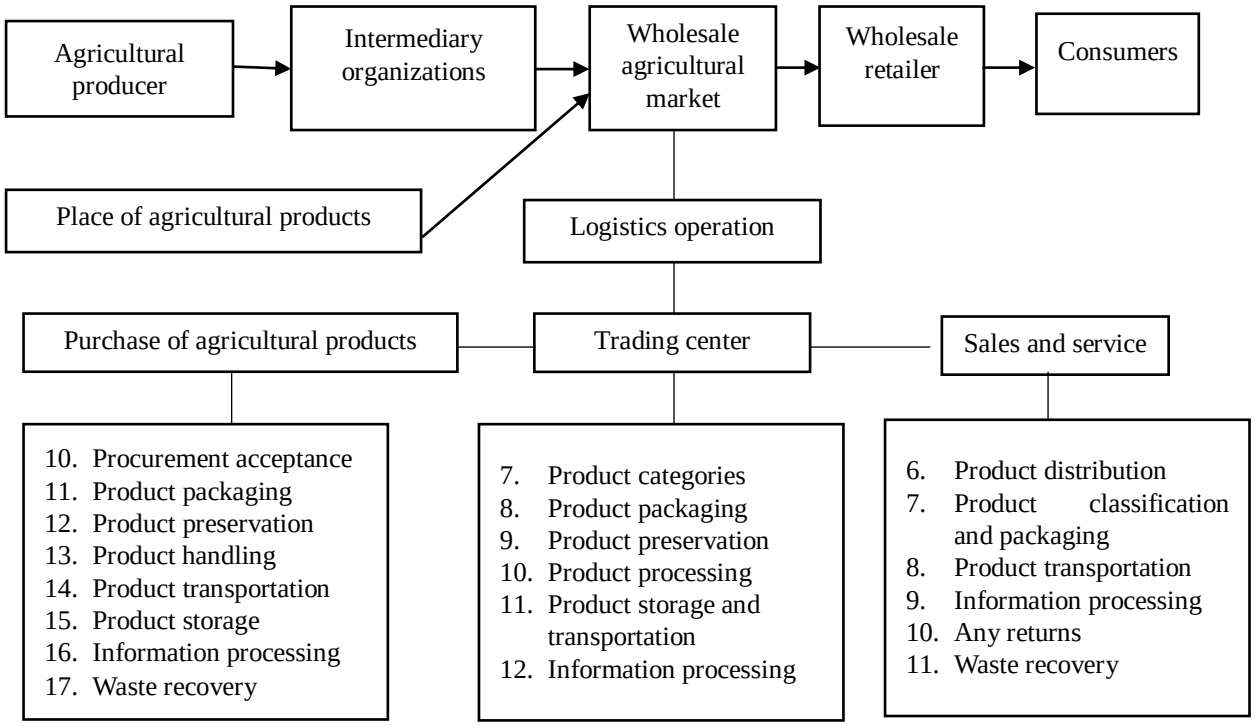

Fig.1.9 - Logistics mode with farm products terminal markets

Source: developed by the author

The agricultural intermediary organization-dominated model, as shown in Figures 1.10. In this model, third-party agricultural logistics enterprises are the leading ones, connecting agricultural materials suppliers, agricultural products production and processors, wholesalers at all levels, retailers, intermediary organizations, and other enterprises that provide the needed agricultural logistics services. As shown in Figures 1.11.

In the process of logistics operation, the third-party agricultural logistics enterprises are responsible for organizing a series of logistics activities. In this mode, with the professional advantages of the third-party logistics enterprises and the quality services provided, it can improve the logistics efficiency and speed, reduce the logistics costs, and increase the economic benefits.

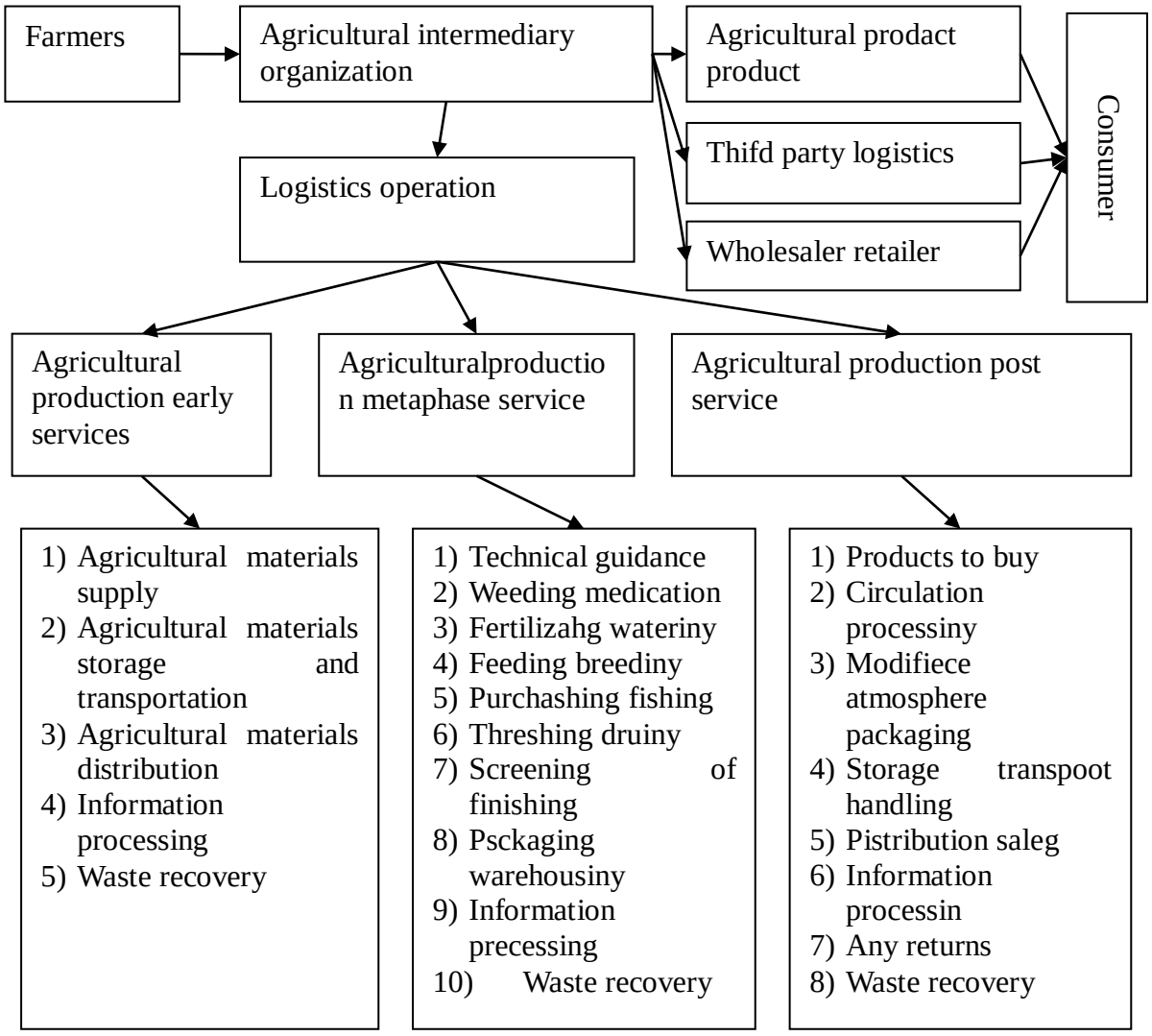

Figure 1.10 - Logistics mode with agriculture medium organizations

Source: developed by the author

Due to the lagging development of third-party agricultural logistics in China, the small number of enterprises, small scale, weak strength, low management level, and backward information system and network construction, this model is rarely used in China.

From the perspective of agricultural logistics operation, the relevant functions of logistics and the flow of business flow are mixed together in the relevant enterprises of agricultural logistics in China, and most enterprises do not operate and manage it as a separate function, and the logistics cost is not calculated separately, and the information communication between the functions system is very weak.

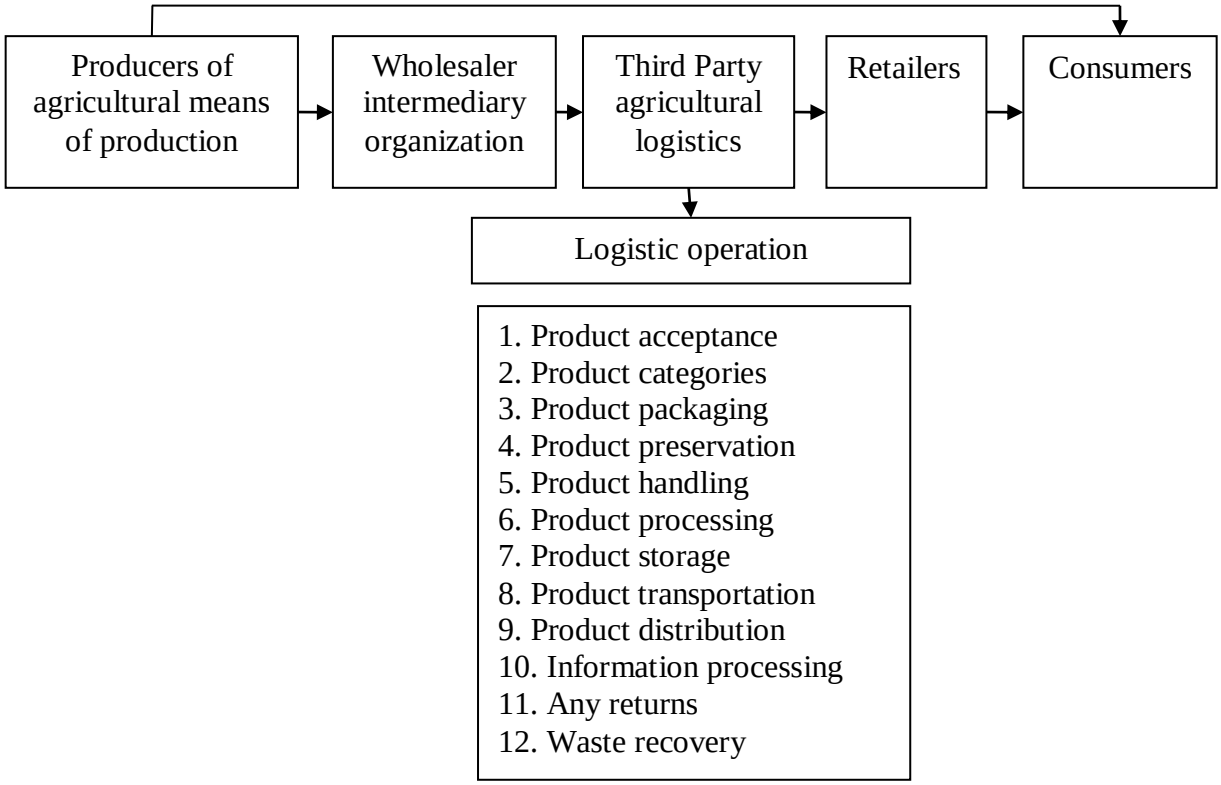

Figure 1.11 - Agricultural logistics mode with the third-party

Source: developed by the author

From the perspective of agricultural logistics management, the logistics management of the current model is also multi-paragraph and decentralized, which is influenced by the traditional thinking mode of "wholesale retail".

From the perspective of sustainable development, as part of economic activity, agricultural logistics activities also face environmental problems. Agricultural logistics is an important link in the production of social development, involving two large systems of economic and ecological environment, and in the current model of agricultural logistics development, economic development is a one-way relationship with agricultural logistics, consumer life and agricultural logistics. (Shinuya Nakata, 2003)

In general, our country's agricultural logistics development model is still traditional, backward, difficult to adapt to the requirements of economic globalization and sustainable development, and it is difficult to meet the demand of the market in a timely manner.

There are many factors affecting the development of agricultural logistics, such as logistics infrastructure construction, logistics channels, market system, agricultural industrialization level, the development of intermediary organizations, the logistics awareness of decision-makers in each link of the supply chain, the changes of domestic and foreign competitive environment, logistics technology and management level, etc. Therefore, the modern agricultural logistics development model is not the same, there can be many choices, but no matter what mode to choose and we must follow the following three basic principles:

- interest principle;
- efficiency principle;
- principles of sustainable development.

Based on the supply chain strategy and the actual development of agricultural industrialization, several alternative agricultural logistics development modes are proposed. In these modes, which mode to be adopted should be determined according to the development level of local agricultural industrialization, the service capacity of agricultural logistics subjects and other factors.

1. Supply chain integration development model.

This development mode refers to the core enterprises in the agricultural logistics supply chain to integrate their supply chain and form the development mode of the enterprise logistics system. In the agricultural supply chain, with a certain scale, coordination and control ability, high business reputation, if the agricultural logistics as development strategic element, then the enterprise will actively become the core of the supply chain, in the agricultural logistics supply chain related customers, suppliers and enterprises, integrate various logistics functions, in service level, efficiency, efficiency and efficiency to make the appropriate logistics function positioning, realize the supply chain integration operation management, establish enterprise agriculture logistics system. (Liu Fei et al, 2002)

2. Linkage mode of intermediary organization.

This model takes a variety of intermediary organizations as the link to organize a full range of services before, during and after production, so that a large number of

scattered small-scale producers and operators can unite to form a larger unified group, achieve scale efficiency, and improve market bargaining power and increase farmers' income.

3. Third-party agricultural logistics mode.

This mode is a mode in which the third party agricultural logistics enterprises independently contract part or all of the logistics business of one or more agricultural producers or agricultural materials and agricultural products dealers. Third-party agricultural logistics enterprises can undertake logistics business by themselves or entrust some logistics business to others. It can be a comprehensive logistics enterprise or a functional logistics enterprise.

4. Agricultural logistics alliance model.

The mode of agricultural logistics alliance refers to the logistics mode of a loose network organization with complementary advantages, risk sharing and benefit sharing formed by two or more agricultural logistics subjects in order to achieve the strategic goal of agricultural logistics through various agreements and contracts, which is the form widely adopted abroad.

5. Node, connection, and network mode.

This mode refers to the establishment of agricultural logistics nodes, through the establishment of connections between nodes, and then the formation of agricultural logistics service network. Networking is the basic feature of modern agricultural logistics, and the agricultural logistics efficiency directly depends on and is limited by the network structure. Modern agricultural logistics service network is formed by the organic combination of nodes, links, levels and activities. Nodes have certain functions and spatial locations, can be enterprises, suppliers, customers, logistics facilities; transportation and communication are links between nodes; hierarchy refers to the organization management and functional hierarchy in agricultural logistics service network; (Yang Hongfen, 2002)

6. Electronic virtual supply chain mode.

Electronic virtual supply chain mode is mainly to establish a business platform with the help of network, suppliers, manufacturers, wholesalers, retailers, logistics

suppliers and other mem/bers to join in the form of membership, for customers and consumers to inquire, forming a virtual agricultural logistics supply chain. In the operation of virtual supply chain, the cooperation of logistics enterprises is balanced, and the information transparency, accuracy and timeliness are high, so it can reduce the inventory increase caused by uncertain demand, overcome the shortage of poor supply chain agility, reduce the operation cost of agricultural logistics, and improve the efficiency of the entire agricultural supply chain. (Zhang Min, 2004)

The strengthens the position of farmers in the agricultural logistics system

cultivates and expands the subjects of agricultural logistics: strengthens supply chain relationship management; accelerated the construction of agricultural logistics (Lv Qinghua, 2004); adopts advanced management methods, and constantly improve the agricultural logistics technology; functions the service function of the government; promotes agricultural green logistics operation; the strengthens scientific research and talent training.

Conclusions to section 1

Each subject has its specific subject personality and the thinking and method of constructing the logical framework of the subject. Due to the interdisciplinary and comprehensive characteristics of modern agricultural logistics, its research ideas and methods must embody the characteristics of universality and uniqueness. By using the determination of modern agricultural logistics' connotation, as well as advanced agricultural logistics role, characteristics, categorization, management, evolution trend, modern agricultural logistics industry discrimination, based on the prospect and review of the development of agricultural logistics at home and abroad, the development of modern agricultural logistics theoretical thinking. Based on the practical application and theoretical development as the goal, with the experience of international agricultural logistics development for reference, analysis of the evolution and development of Chinese agricultural logistics present situation, influence factors, puts modern agricultural logistics mode's development forward,

with the concept of supply and demand of modern agricultural logistics system's construction, with logistics of agriculture reasonable logistics organization innovation's of agriculture goal, on this basis, the proposed development Chinese modern agricultural logistics countermeasures and suggestions, and strive to provide theoretical and decision-making basis for the relevant departments.

This section also from the basic theory section. On the premise of defining the connotation of modern logistics, this paper defines the concept, function and characteristics of modern agricultural logistics, and discusses the management of modern agricultural logistics, modern agricultural green logistics, modern agricultural logistics development trend and modern agricultural logistics industry in detail. Studies suggest that modern agricultural logistics is to satisfy customer demand as the goal, supported by information technology, the use of modern means of logistics, the means of agricultural production and agricultural output content and related services and information, from the source to consumption source of organization, control and management, and other economic activities, is an important part of the whole society logistics, a implementations use value, value, promote competition, regulation and other functions and points of a wide range of large, independent, exclusive, non-balance, value preservation, processing value-added, greater risk and other characteristics. Modern agricultural logistics management is the scientific management of the logistics activities in the process of agriculture before, during and after production, so as to achieve the service level satisfied by users with the lowest agricultural logistics cost. Modern agricultural supply chain management is a new agricultural logistics management mode. Modern agricultural green logistics is the sustainable development direction of modern agricultural logistics. Modern agricultural logistics has the development trend of specialization, standardization, advanced technology, brand, intensification, coordination and green. Modern agricultural logistics industry is a compound or aggregation industry formed by the industrialization of agricultural logistics resources, which has the characteristics of multi-industry, basic, service and integration.

The development mode of agricultural logistics is related to the efficiency and benefit of agricultural logistics. At present, the main development modes of agricultural logistics in China are self-supporting logistics mode, agricultural intermediary organization leading mode and third party agricultural logistics mode. However, the vast majority of enterprises that adopt self-supporting logistics mode have low resource utilization rate, poor information flow, high logistics cost and low agricultural logistics operation efficiency. Most of the intermediary organizations are lagging behind, their legal status is not clear, and they cannot undertake the organization and management activities of agricultural logistics. The number of third-party agricultural logistics enterprises is small, the scale is small, the management level is low, the information system and network construction is backward, can only provide simple services, the lack of value-added services, almost do not have the ability to coordinate, organize and manage agricultural logistics. At the same time, the current mode of logistics management is multi-stage, decentralized. Under the current development mode of agricultural logistics, the relationship between economic development and agricultural logistics, consumption life and agricultural logistics is one-way, which has caused serious damage to the ecological environment. Follow the principle of the interests, efficiency and sustainable development, contact the specific national condition, from the perspective of system theory and sustainable development, the thought of supply chain integration mode, intermediary organizations linkage mode, the third party logistics mode, node and link, network development and electronic virtual supply chain model is a main mode of our country's modern agricultural logistics development in the future.

Specify the points of the conclusions more specifically:

1. Through the determination of the connotation of modern agricultural logistics, as well as the analysis of the function, characteristics, classification, management, development trend and modern agricultural logistics industry of modern agricultural logistics, on the basis of reviewing and looking forward to the development of agricultural logistics at home and abroad, theoretical thinking on the development of modern agricultural logistics.

2. Aiming at theoretical development and practical application and drawing on the experience of international agricultural logistics development, this paper analyzes the evolution and development status and influencing factors of agricultural logistics in China, and puts forward the mode of developing modern agricultural logistics.

3. Modern agricultural logistics management is a scientific management of logistics activities in the process of agricultural production to achieve customer satisfaction with the lowest cost of agricultural logistics service level. Modern agricultural supply chain management is a new mode of agricultural logistics management. Modern agricultural green logistics is the direction of sustainable development of modern agricultural logistics.

CHAPTER 2

SCIENTIFIC AND METHODOLOGICAL PROVISIONS ON LOGISTIC MANAGEMENT IN THE WORK OF AGRICULTURAL COMPANIES

2.1 Comparative analysis of agricultural logistics with developed regions

This chapter discusses the world economic developed areas of North America, western Europe, East Asian countries representative of agricultural products logistics, and China in the modernization of agricultural products circulation, logistics organization and operation mode, logistics facilities and technical level and logistics system, its purpose is to summarize the advanced experience of developed countries and regions, for the establishment of China's agricultural products logistics model.

North American agricultural production represented by the United States and Canada, as the earliest region to realize agricultural modernization, is known for its high specialization, scale and regionalization. Its main feature is characterized by "large production and large circulation". North America has a high regionalization of agricultural products, the high scale of production, a large-scale enterprise farm developed by the producing area supplies a large scale of production, which promotes the establishment and development of the production organization, and the cooperation between organizations increases the control and control of the production organization. North America is home with the highest standard of living in the world One of the district, its agricultural products logistics activities are serialized, professional, diversified, multi-form, multi-level, multi-category services.

North American agricultural products logistics private investment, free competition nature is strong, its main agricultural products logistics service main type and its agricultural products. See Figure 2.2 for the operating ratio. Because the cost of agricultural products logistics, especially fresh agricultural products logistics, is usually very large, it is the main part of agricultural products prices.

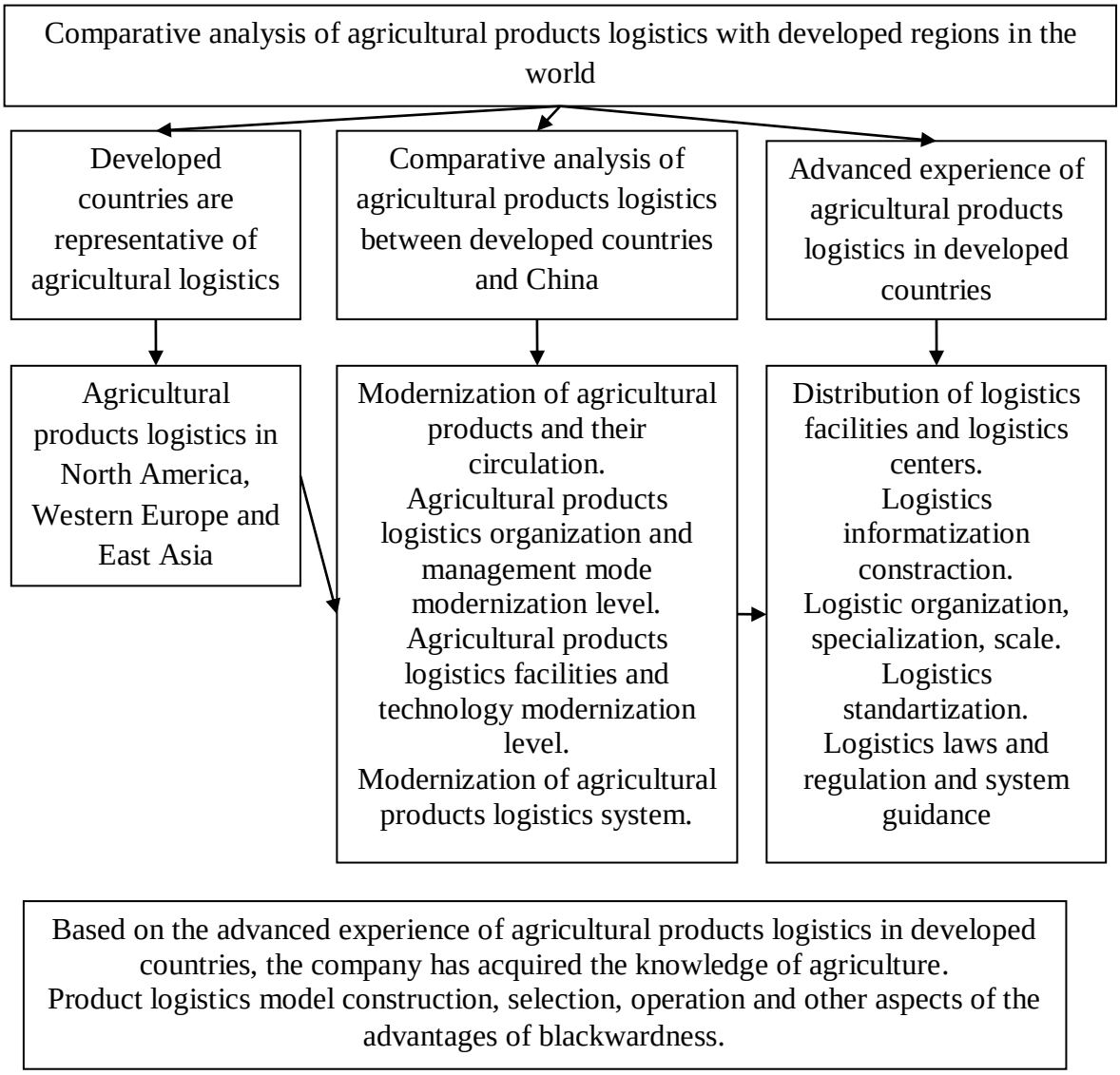

Figure 2.1 - Content structure diagram of this chapter

Source: developed by the author

Under the double pressure of profit drive and competition, in order to meet the huge demand on the consumer market, North American agricultural products logistics must promote the development of sellers and sales organization, to reduce costs in order to maintain market competitiveness, shorten the agricultural products logistics chain, reduce the circulation of flat trend has become an important feature of North American agricultural products logistics.

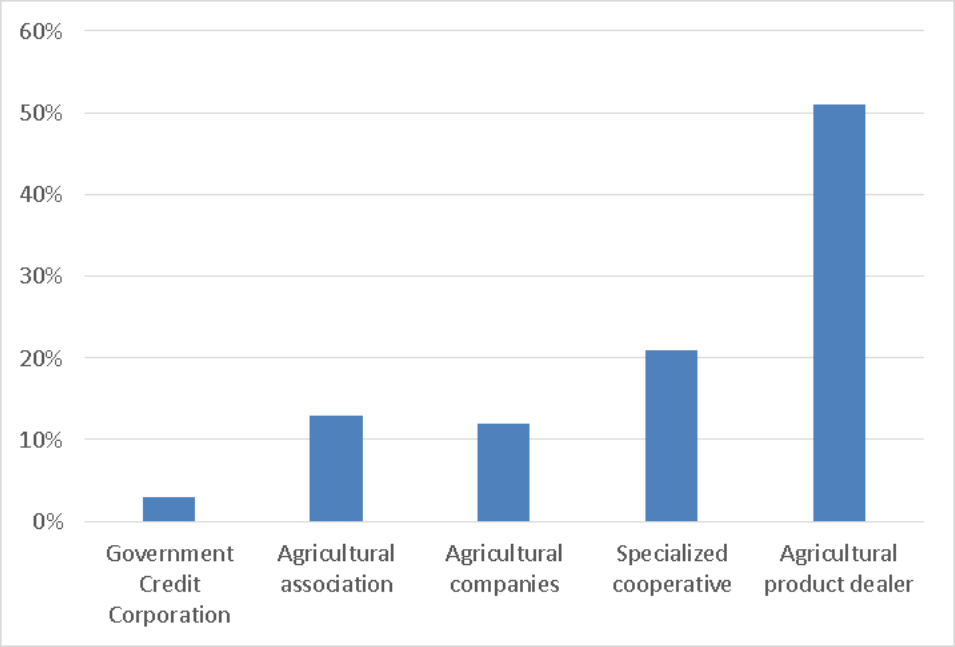

Figure 2.2 - Agricultural products logistics amount of each service subject under North American agricultural products logistics mode

Source: developed by the author

Its initiatives are mainly built through developed logistics information systems, convenient logistics infrastructure, and producer and producer organizations and retail terminal organizations such as large supermarket chains Established long-term direct selling system was reached.

According to statistics, nearly 80% of the agricultural products in the United States are circulated through the above direct selling mode of "production place - distribution center -supermarket and chain store - consumers", while part of the circulation functions of the domestic agricultural products wholesale market have been gradually replaced. In the direct selling mode, the compression of the circulation link greatly shortens the time of products from production to sales, which not only ensures the quality of agricultural products, but also large supermarkets generally have their own distribution center, with stronger logistics cost control ability, and the product quality tracking mechanism is more strict with (Bian Shengnan, 2010).

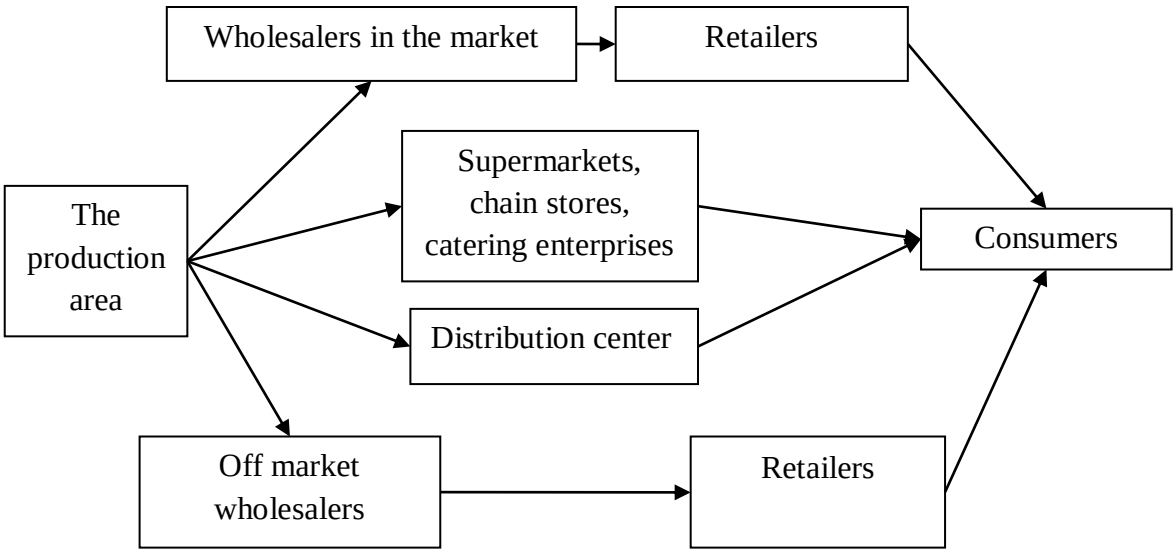

Figure 2.3 Agricultural products logistics in North America

Source: developed by the author

Compared with the above North American countries, represented by France, Germany, the Netherlands of western European countries, with the help of western European countries developed market, information network, western European national geographical advantages and strong homogeneity culture of active regional exchanges, and the EU support for agricultural products circulation, it is easier to form a larger proportion of agricultural products direct sales. In France, direct sales of agricultural products have reached 90 percent.

Different from the function of North American agricultural product logistics wholesale market is gradually replaced, in Western European countries, due to the joint influence of dense distribution, high urbanization level, good agricultural foundation and economic development, some countries take advantage of their special geographical and economic advantages to form an international wholesale agricultural products market. For example, Hang is International Agricultural Products Wholesale Market in Paris, as the largest wholesale market in the world, has the annual number of agricultural products of 1.8 billion tons and the annual transaction amount of 8 billion euros. The circulation scope covers Germany, Spain, Italy, the Netherlands and other surrounding Western European countries. In addition,

as an early stage to carry out national public welfare construction in western Europe, most of these wholesale markets belong to the national public finance investment field and have public welfare. For example, France has designated 23 wholesale markets in China as national public welfare wholesale markets, and 30 out of the 34 fruit and vegetable wholesale markets in the UK are public welfare markets invested by the government. This is because most of the circulation infrastructure of agricultural products has the characteristics of public goods or quasi-public goods, not used to self-serve, but to provide productive services for enterprises within a certain range, thus having a positive external effect in the economic meaning of public welfare. In this sense of understanding, some foreign experts will be agricultural products logistics industry although classified in the people's livelihood service industry, it is not widely accepted, it still reflects that agricultural products logistics is different from industrial products logistics and other categories of logistics, and has strong public welfare characteristics.

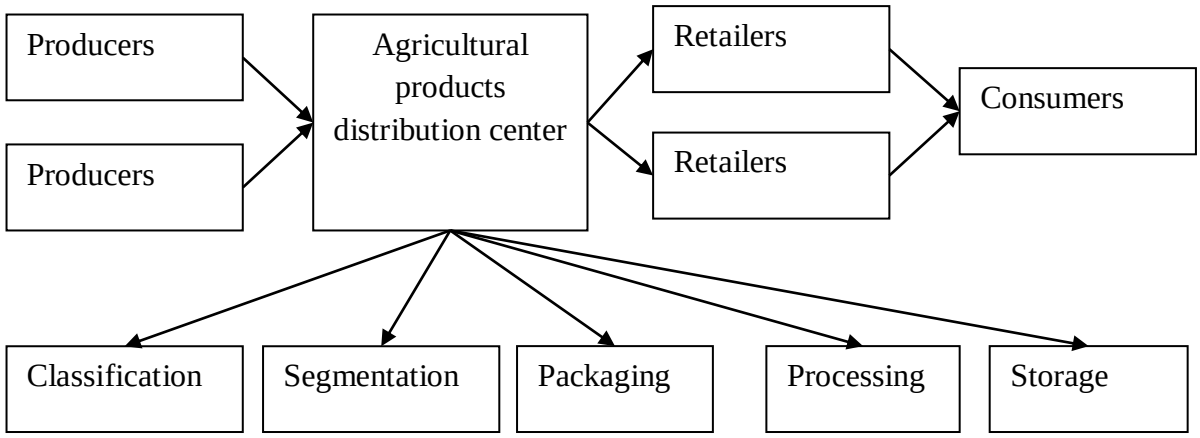

Figure 2.4 Agricultural products logistics in Western Europe

Source: developed by the author

At the same time, the western European agricultural products supply chain supply, production and sales integrated development characteristics are remarkable. Integrate the source of raw materials upward, improve the deep processing ability downward, grasp the market sales downward, and have the overall competitive

advantage and cost advantage; so the market competitiveness is stronger. The integrated supply chain operation mode can create a broad business scope of agricultural products logistics industry, covering agricultural materials, agricultural products production, agricultural products processing, biological energy and other industries, and make closely related, extend products and services from farmland to retail shelves and achieve operating cost savings. Such as founded in 1818 in Amsterdam, one of the four global grain merchants by integrating global agriculture, agricultural supply chains and production chains. With the earlier urbanization process and higher living standards in Europe, the highly standardized production and different group mechanical operation adopted by agriculture in Western Europe make it also have the nature of sightseeing agriculture.

East Asian agricultural products logistics and North American and western European countries of agricultural products "big production", Japan, South Korea and other East Asian countries and regions are subject to the limited geographical environment, agricultural products mainly in small unit production, small production scale, but corresponding to the "small production", these areas due to economic development, market demand is very strong, which determines the emergence of the "big market, big circulation". Japanese agricultural products are first transported to the wholesale market by producers (or agricultural associations, traffickers, etc.) to the wholesale market. The wholesale market of agricultural products accounts for about 80% to 90%, only for the sales of some specific varieties of agricultural products direct sales can be conducted.

Wholesale markets in East Asia are very advanced, both in terms of infrastructure and equipment, and in logistics technology, and in scale. The trading methods provided by the agricultural products wholesale market are mainly auction system. The procedures for organizing the auction include "collection ~ inventory ~ sample ~ auction ~ delivery". The market managers publicize the origin, variety, quality and quantity of agricultural products, brokers or buyers and sellers, and with the high price, the buyer should bid.

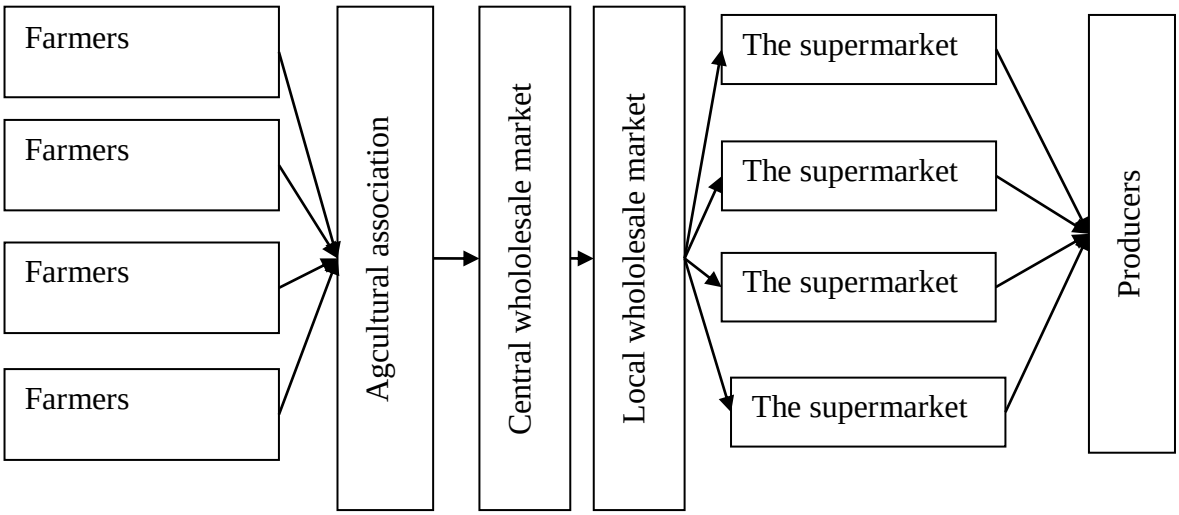

Figure 2.5 - Agricultural products logistics in East Asia

Source: developed by the author

In addition, the agricultural association has also played a huge role in solving the problems of small production when facing a large market. In Japan agricultural association, for example: the specific functions of the Japan agricultural association members of the agricultural management, production technology and life guidance, advice, a variety of materials jointly purchase and joint sales of agricultural products, as well as agricultural production, living facilities set up and utilization, etc., Japan agricultural association in recent years more committed to strengthen the farmers shopping malls and other docking activities with the community.

Comparison of the modernization level of agricultural products and agricultural products The following index analysis (Tu Hongbo, 2013) on the basis of China, the United States, Canada, France, Germany, and Japan from the number of major agricultural products, agricultural production index and main operating benefits of agricultural products.

Production index of agriculture is a relative number reflecting the dynamic changes of output of various agricultural products comprehensively. It is an important index to reflect and study products' of agriculture production speed.

Table 2.1 - Number of major agricultural products in 2019 (unit: ten thousand tons)

	The World	China	USA	Canada	France	Germany	Japan
Grain	278743,8	61368,2	4821,2	19170,0	8452,3	3170,3	1242,6
Rice	98414,7	21149,5	839,6	.....	.....	.....	1052,7
Wheat	107412,3	13361,1	5258,1	3266,9	4060,5	2306,2	.....
Corn	113383,7	26078,4	34701,3	1519,3	907,1	566,9	.....
Soybean	44111,8	18101,7	9666,7	614,5	42,9	.....	21,78
Fruit	81123,6	24838,0	2544,2	.....	868,1	245,4	308,3

Note: The quantity not included in the table is non-major agricultural products in the country

Source: developed by the author

China has an advantage in absolute quantity, but first of all, it has to meet a huge population base's basic needs, and products of agriculture of China will be in a balanced and tense state for a long time; Limited by a lot of factors, the enterprise started, the foundation was weak, logistics industries of agriculture modernization level was low, and the performance of cost, processing of agriculture, inventory and other indicators was far behind that of developed countries. In contrast, about 4% of total population of the world is accounted for by the population United States, and about 2% of the national labor force is accounted for by its labor force of agriculture.

Table 2.2 - Agricultural Production Index for 2013

	The world	China	USA	France	Japan
Agricultural	109	115	105	98	101
Food	110	115	107	99	98

Source: The United Nations FAO database.

Development index of agriculture refers to the agricultural production index that is calculated by the weighted average of physical output indexes of various agricultural products.

Table 2.3 - Main operating efficiency indexes of agricultural products in 2019

	Wholesale and retail inventory rates	Number of turnover of working capital	Proportion of added value of agricultural products in GDP	The cost	Attrition rate	Processing proportion	Processing productivities	Precooling freshness retention rate
Developed country	0,8%-2%	18%-25%	23%	8,7%	1%-3%	85%	350%-400%	85%-100%
China	25%	3,2%	9%	44,3%	17%-26%	20%	90%-170%	41%

Source: International Statistical Yearbook, China Statistical Yearbook

To some extent, the total amount of major agricultural products in the United States, however, ranks firstly on earth, and its labor productivity of agriculture ranks the highest in the world, with "mass production" as the main factor. In the current environment, products' of agriculture logistics presents the characteristics of various types, frequent transfer and large output. Mature integrated agricultural product logistics service subjects make products' of agriculture modern circulation level very high. Japan is the hub and largest channel of products logistics of agriculture. Products wholesale market of agriculture of China has solved the contradiction between large market, large circulation and small-scale agricultural production, and can meet the double-cycle demand and expansion of the sellers of transportation and sales scale and trading market space, while saving transaction costs.

Now take China, the United States, France and Japan as an example, the comparative analysis of index data from the main agricultural product circulation subjects, agricultural and agricultural product logistics practitioners, and the unified distribution rate of agricultural product circulation chain enterprises.

Table 2.4 - Circulation subjects of agricultural products

	China	USA	Japan	France
Main part	The wholesale market	Private businesses	The wholesale market	The wholesale market
Account for agricultural trade volume	70%-80%	78,5%	90%	80%
Principal part	Private providers	Cooperatives associations companies	Agricultural association	Public welfare organization

Source: developed by the author

From the above data, Chinese agricultural logistics entities are not fully developed, mainly composed of individual farmers, small business scale, low organization, which leads to their weak market competitiveness, lack of self-protection awareness and ability. In terms of agricultural enterprises, although they have Shuanghui, China Agricultural Development Group, Longping High-tech, New Wufeng, Zhangzidao, Guannong, GuiSugar, new agricultural products in the current stage The field, mainly composed of self-employed operators, has a large number, small unit operation scale, narrow logistics network coverage, weak market competitiveness, small market influence, and a low driving effect on the economy.

Table 2.5 - Qualifications of agricultural and agricultural logistics practitioners

China	USA	Japan	France
Technical secondary school or above	Bachelor’s degree	High school diploma	Agronomy specialty
10,89%	92%	75%	95%

Source: developed by the author

Due to the limitation of agricultural production conditions, Japanese farmers are similar to China in terms of small scale. Compared with the higher organization of Japanese farmers, Chinese cooperative economic organizations have not become an important subject in agricultural products marketing. In addition, the wholesale market is the main organizational model in agricultural products circulation, which is substantially similar to Japan and Korea in East Asia. addition to the different subjects in Table 2.4, in the organization of agricultural products logistics, developed countries achieve almost 100% of the collective unified transportation Sales, and the collective organization transportation and sales of agricultural products in the Chinese wholesale market accounted for 7.8% of the total, farmers jointly sold 12.9%, and the proportion of farmers themselves transport and sales reached 70.1%, which is also the logistics cost of agricultural products, is an important reason for the high price and lack of China's agricultural products competitiveness. In addition, compared with the obvious public welfare wholesale market nature, China has adopted the mode of enterprise management, in this case, the relevant operators will inevitably charge a number of fees, the wholesale market as a tool of profit, will greatly improve the transaction cost of agricultural products, agricultural products prices, farmers and consumers benefit lost. Therefore, the government should clarify the public welfare attributes of agricultural wholesale market; adopt preferential policies in land use, taxes, loan and other aspects, so that the construction and development of agricultural wholesale market can enter into a benign track (Su Wei, 2012).

Table 2.6 - Unified distribution rate of agricultural circulation chain enterprises

China	USA	Japan	France
37%	80%	70%	80%

Source: developed by the author

In the training of high-quality logistics professionals, the US government has always valued the investment in agricultural science research and development and rural education projects, and about 92% of American logistics managers have a bachelor's degree or above. France also has initial or service-process training for logistics personnel. With the rise of logistics fever, Chinese colleges and universities and all kinds of training institutions began to expand the establishment and enrollment of logistics majors, but at present, the proportion of logistics practitioners with technical secondary school degree or above is still less than 15%.

China is among the top in the world in terms of road mileage, and the road density is basically the same as that of the US. However, if further considering the population density of 138 people / square km (about four times that of the United States), the actual per capital road density is much lower. The transportation facilities in the United States are very complete. Through the multimedia logistics methods such as land transportation, water transportation and air transportation, the large-scale network structure roads throughout urban and rural areas can achieve the "door-to-door" logistics requirements.

Table 2.7 - Cold Chain Logistics Information

	Cold chain service in the proportion of national population	Fruit and vegetable cold chain logistics transport rate	Meat and poultry cold chain logistics transport rate	Cold storage capacity (million m^3)	Cold storage capacity(m^3/person)	Per capital annual consumption of quick-frozen food(kg/person)
China	80%	5%	15%	15	0,1	6
The developed countries	10%	95%	100%	8,5(France) 13,4(Germany) 27,69(Japan) 70,74(USA)	1,03(USA) 1,57(Japan)	20

Source: developed by the author

Logistics information facilities and network are developed, the mechanization level of storage and transportation equipment is high, and can all realize mechanical automation operation. France makes the best of its excellent location Organizations of land, air, river and sea transport around the goal of building a European logistics platform for foreign enterprises, to provide customers with the highest response speed. Take the cold chain logistics as an example.

Driven by the effective effect of China's consumer demand annual growth rate of 20%, China's cold chain logistics market is growing rapidly. The National Development and Reform Commission shows that about 400 million tons of fresh agricultural products enter the circulation field every year. However, compared with dozens of times the demand, the cold chain logistics capacity of agricultural products is seriously insufficient. The overall scale of the cold chain facilities of agricultural products alone varies quite from the developed countries; the vast majority of the cold chain facilities are located in economically developed areas with unbalanced distribution; refrigeration capacity is only 20% to 30% of goods demand, about 50,000 refrigerated vehicles, only 0,3% of trucks, railway There are about 8,000 refrigerated vehicles, with only 2% of the national total freight railway vehicles, and the cold chain circulation rate of fruits and vegetables, meat and aquatic products is only 5%, 15% and 23%, respectively. The loss rate is as high as 30%; the relevant indicators of developed countries are in sharp contrast. For example, in Japan, the cold storage of agricultural products has achieved high density and professional layout. There are 120,000 thermal insulation vehicles, the average cold chain circulation rate of agricultural products reaches 98%, and the loss rate is only 5% (ZhongYing, 2012).

Market concentration can reflect the modernization level of the agricultural products circulation system. China's agricultural products sold by supermarkets only account for about 30 percent of the total sales volume.

Table 2.8 - Market concentration of agricultural products

China	USA	Japan	French
The supermarket 33%	The supermarket 80%	Agricultural	The supermarket 60%

		association 65%	

Source: developed by the author

The concentration of American retail industry is very high, with Wal-Mart, such as Wal-Mart, Home Storage and Krog, and large retail groups dominating the domestic retail industry through large-scale operation, with Wal-Mart ranked first in the world's top 500 companies. U. S. supermarkets only account for more than 80 percent of total fresh agricultural sales, and these large supermarkets generally have their own distribution centers to strictly control transport costs and strictly track product quality. In the agricultural products through the wholesale market In terms of field sales, large and scale are the common characteristics of wholesale markets in developed countries, such as the Tokyo Central Wholesale Market Land Market, only 10 auction wholesalers, but the total turnover is as high as 587,8 billion yen. It is estimated that in 2021, the wholesale market of grain and oil of more than 100 million yuan accounted for 35% of the wholesale and retail sales of grain and oil above quota, 50% different from that of Japan.

The modernization level of agricultural products circulation system is also largely influenced by the government's macro and micro policies. As a basic industry, governments of all countries generally attach great importance to the role of policies in agricultural production and circulation. Special laws and regulations should regulate the circulation of agricultural products through the formulation, so as to maintain a coordinated, flexible and efficient operation state and improve the trading efficiency of agricultural products. The United States government has formulated the Commodity Trading Act, the Food GMP (Good Operation Code), the Organic Food Production Act and other corresponding laws and regulations, to improve the agricultural products market system, standardize the logistics market order, strengthen the safety and quality of agricultural products, and promote the development of agricultural products logistics Create a good external environment. When regulating the circulation of agricultural products, Japan takes the Wholesale Market Law as the basic law and a series of local regulations, such as the Food

Circulation Review Order, which constitute a relatively complete and standardized legal system of agricultural products circulation.

At present, China is regulating the circulation of agricultural products, mainly with the Agricultural Law as the main body, and supported by the Agricultural Products Quality and Safety Law, the Seed Law and other relevant laws and regulations. At the same time, there are defects such as the imperfect main legal system, the imperfect laws and regulations regulating the trading of agricultural products market, the agricultural intellectual property protection is not in place, multiple departments can issue administrative orders and planning disorder, and there is a certain degree of agricultural products circulation market chaos and inability to follow. Therefore, it is urgent to introduce a leading law, integrate the existing laws and regulations, improve the legal system, and create a good development environment for the construction of China's agricultural products logistics industry.

1. The state should guide the construction of logistics infrastructure in macro and unified way based on national conditions. In order to ensure the overall interests of the country while taking into account the economic development of various regions, the development of modern logistics must be based on the construction and improvement of modern logistics facilities. The experience of developed countries is carried out by the government considering the national conditions on the basis of the guidance of macro unification.

In order to solve the contradiction of "small production and large circulation" of its agricultural products, the government began to attach great importance to the construction of logistics infrastructure since the 1960s. In particular, the Japanese government can carry out a step-by-step unified layout of logistics facilities according to its economic development status in different periods, combined with the regional natural and geographical location, transportation conditions and logistics intensity. Expressway network, new trunk railway transportation network, coastal port facilities, aviation hub port, storage and distribution centers and other infrastructure are very perfect. At the same time, a large number of agricultural products processing enterprises with modern logistics technology and equipment,

generally purchased, with sorting, freezing, storage, transportation, and other a set of standardized circulation methods, among which the commercial treatment rate of fresh agricultural products after production is nearly 100%.

Canadian land area is large, small population and high concentration determines its agricultural products logistics is mainly concentrated in economically developed urban areas, such as Vancouver, Toronto, Montreal and other places, plus the logistics distance is often far, is required to form can effectively connect the major cities of long-distance operation, efficient agricultural products logistics system. To this end, Canada attaches great importance to the construction of a comprehensive agricultural products logistics infrastructure system jointly developed by water transportation, railway, highway and civil aviation, forming the east coast transportation network centered on the Port of Montreal, The west Coast transportation network with Vancouver as the center and the north-south transportation network across the United States and Canada ports (Tao Qian, et al., 2011).

Every year, the EU subsidizes projects to improve logistics infrastructure conditions for the transport, storage, processing and sale of agricultural products, which account for 25-50% of EU agricultural funds. The construction of logistics centers in Germany follows the development mode of overall planning by the federal government, construction supported by the state government and independent operation by enterprises, with the main purpose of improving the economy and rationality of cargo transportation and developing the comprehensive transportation system. The Netherlands has the highest refrigeration and freezing capacity per capital of agricultural products in the world, and the transportation, storage and distribution of agricultural products are of high quality.

2. Make full use of advantages and plan logistics center reasonably. Because the fresh life of agricultural products is generally short, consumption must be reduced to the maximum extent in the logistics process. Therefore, on the basis of convenient transportation brought by complete logistics infrastructure, it is particularly important

to carry out the planning and design of logistics network distribution scientifically and reasonably.

The large-scale wholesale market layout of agricultural products in EU countries is also very reasonable. As an important transportation hub in Europe, the Netherlands has the world's largest port Rotterdam and is well known for its highly mechanized agriculture and animal husbandry. Holland makes full use of its geographical advantage in the central area of Europe to establish a professional agricultural products logistics center and become the agricultural products logistics hub of the whole European region. These professional logistics centers (see Figure 2.4) are located near planting areas or agricultural products trading markets, so as to facilitate agricultural products logistics processing according to the specific requirements of trading.

The application of logistics information means separates the commercial flow and logistics of agricultural products circulation and greatly improves the efficiency of agricultural products logistics. Therefore, developed countries regard informatization construction as the basis of agricultural products logistics development.

The application of information technology has played a huge role in supporting modern logistics in the United States, which is an important reason for the United States to become the most developed country in agricultural products logistics industry. In the process of agricultural products information collection, the wide use of two-dimensional code technology and radio frequency identification technology (RFID) has greatly improved accuracy and efficiency. The information exchange between retailers and producing areas of agricultural products mostly uses The Electronic data interchange technology (Web EDI) based on the Internet, which makes the transaction process more convenient and also helps to reduce and shorten the circulation links of agricultural products.

Relying on the advantage of developed Internet, Japan's agricultural wholesale market has a high degree of information. When trading, both parties can only look at the sample information to realize the transaction, and the physical goods from the

origin of direct delivery to supermarkets and other places of sale. Wholesale markets establish large network agricultural product business centers, with agricultural product suppliers and retailers as members. The function of the centers is to collect information of supply and marketing parties through the logistics control system, provide agricultural product information that meets the requirements of all parties, and promote trading cooperation (Fan Fei, 2011).

The logistics information industry in Europe started earlier. At present, with advanced and perfect information system, agricultural products logistics has basically realized information and automation. The large enterprise group engaged in agricultural products logistics connects the national demand information with the chain operation network all over Europe through the information network, and establishes the direct market through the online transaction.

1. Strengthen the organizational construction of agricultural products logistics represented by industry associations. Agricultural Cooperatives in Japan, agricultural cooperatives and trade associations in the United States mentioned above are specialized agricultural products logistics organizations established to improve the trading level and efficiency of agricultural products. Their high degree of organization determines their strong influence in the industry. The producers, processors, sellers, relevant government departments, scientific researchers or units of this kind of agricultural products can become the participants of the organization, and its function is to promote the integration of enterprises and farmers in the production, processing and trade of the same industry. Agricultural product industry association plays an important role in providing purchasing and marketing information service, accelerating the flow of agricultural products, strengthening industry self-discipline, technical exchange, and influencing industrial policies.

2. Strengthen the construction of specialized logistics system for agricultural products. The existence of large-scale benefits, so that specialized agricultural products logistics compared with comprehensive agricultural products logistics can save resources and improve efficiency. The specialization of agricultural products logistics system is facilitated by the division of labor in the field of agricultural

products circulation. It is established on the basis of specialized operation and high technical conditions of agricultural products logistics providers. Agricultural products are circulated through specially designed channels, or direct sales of agricultural products from producers to various receivers through professional agricultural products logistics organizations. In addition, the increase of logistics industry concentration is also the basis for the development of agricultural products e-commerce.

3. Increase the scale development of agricultural products logistics. Through the scale of agricultural products logistics center, the scattered order together, aggregation, and massive amounts of information goods to docking or cultivating scale logistics enterprises, the rapid promotion of agricultural products logistics industry concentration, can play as a whole the distribution scale effect, can reduce the transportation and storage costs, etc. The scale of the logistics cost advantages. The large-scale logistics center platform also provides space for the application of modern science and technology, which can further optimize the logistics system, reduce transit links and reduce losses.

Logistics standardization is the key to the rapid improvement of logistics efficiency of agricultural products. Compared with the infrastructure, technology, information, talents and other problems that affect the efficiency of agricultural products logistics, logistics standardization is the easiest way to improve. Therefore, to quickly improve the efficiency of agricultural products logistics, logistics standardization will generally become the first choice. At the same time, logistics standardization is of great significance to standardize the order of agricultural products logistics, ensure the quality of agricultural products, reduce logistics costs and other aspects.

Mature and perfect laws and regulations system of agricultural products logistics is the guarantee that agricultural products circulation can maintain coordination, flexibility and efficient operation.

The United States has the whole process of agricultural logistics, relatively complete agricultural logistics laws and regulations. The Commodity Trading Act,

which was revised in 1974 and 1992 respectively, has made detailed regulations on the production, processing and circulation of commodities including agricultural products. The "Cold Chain Quality Standards" issued by the American Cold Chain Association in 2004 covers the qualifications and standards of logistics enterprises engaged in storage, transportation and treatment of perishable agricultural products, which has become the legal basis for supervision and guidance of agricultural cold chain logistics enterprises. In addition, the United States also has strict laws and regulations on agricultural product health and safety and agricultural environmental protection related to agricultural products logistics.

In the 1920 s Japan enacted the "central wholesale market method" ("wholesale market method"), is about the basic law of agricultural products logistics in Japan, the central government to agricultural wholesale market construction, management into the orbit of legal system, such as revision once every five years, in the form of law has established the management of the local wholesale market for agricultural products; A series of specialized laws and regulations, such as the Food Administration Law, The Order of the Food Circulation Review Committee, and the Law on the Stability of Vegetable Production and Sales, have made the circulation of agricultural products legally available.

The Laws and regulations of the French government guiding agricultural products logistics mainly include Agricultural modernization Law, Agricultural Law, Cooperative Adjustment Law, Agricultural Guidance Law, French Commercial Law, etc. In order to strengthen the public welfare status of wholesale markets of agricultural products, it formulated "Building an Organized Network of Wholesale Markets for national Public Welfare", which includes scientific planning and strict examination and approval system for the distribution of wholesale markets of agricultural products, and designated 23 large wholesale markets of agricultural products nationwide as public welfare national wholesale markets of agricultural products. Thus creating a good market environment for French agricultural products logistics (Hou Bangyang, et al., 2012).

2.2 China Agricultural Enterprise logistics management system

With the development of information economy, social logistics industry plays an important role in China's national economy. The sustainable, healthy and stable development of the entire national economic system depends on the coordinated development of logistics industry, information industry and financial industry. They are the bridge and link that maintain the effective operation and healthy development of the whole national economic system. Modern logistics industry will become the pillar industry of China's national economy. European and American countries of agriculture is the world's most developed, especially the United States, they are more developed economy, relatively perfect in farm scale, social service system, farmers can enjoy a high level of production services, agricultural production need supplies are mostly in the form of a sign a contract with the corresponding company, the company in accordance with the delivery time, place, variety door-to-door delivery. The same is true for the sales of agricultural products. For this reason, agricultural logistics in these countries is not separately listed for research. It can also be said that agricultural logistics engineers in these countries are integrated into the whole social logistics system.

1. Logistics ensures the normal operation of the reproduction process. The whole production process is actually a series of logistics activities, at the same time, by reducing costs to reduce costs, optimize the inventory structure, reduce capital pressure, shorten the production cycle, to ensure the efficient implementation of modern production.

2. Logistics is an important link from production to consumption. Logistics ensures the cycle from production to consumption and meets the needs of society.

3. Reduce enterprise cost and improve customer service quality.

4. Improve efficiency, increase sales and profits

There are procurement, production, sales and other operating logic in the operation of enterprises. The integrated role of logistics will transcend all this logic and pursue the overall optimal state of "the flow of things" from purchase to sale. The logistics process first meets the customer requirements in the first place, and then designs the overall optimal state of "the flow of things" within the enterprise. This seeks overall excellence in order to improve efficiency.

1. System integrity principle. Enterprise logistics is a part of the whole system of social logistics, so the construction must start from the overall situation and the whole. To fully consider and make full use of the existing logistics resources in the society, such as logistics storage centers, logistics distribution centers, transportation routes and tools, to avoid duplication of resources and waste and other problems, from the overall coordination needs to determine the best plan.

2. The principle of adapting to the characteristics of agricultural production. Logistics system first used in large industrial enterprises and gradually mature for experience and theory, but due to the nature of the seasonal agricultural production and agricultural products, in the construction of modern agricultural enterprises in China logistics management framework, not blindly copying large industrial model, must be combined with China's agriculture, rural areas, agricultural products, such as specific situation, because of things, from place to place, since the design organization, Try to find low-cost, efficient, high-quality logistics services, in order to effectively meet the needs of agricultural production.

3. The principle of improving enterprises' of agriculture core competitiveness. In the market competition, enterprises of agriculture should pay attention to products' of agriculture value-added processing by domestic enterprises to provide high-quality, cheap primary agricultural products, or provide high-quality agricultural production materials timely. Generally speaking, the core competitiveness is not in logistics management, so for enterprises of agriculture, according to the principle of not affecting the core competitiveness and saving logistics management costs, logistics business should be outsourced to professional third-party logistics

enterprises, which is also a problem enterprises of agriculture should consider when constructing their logistics management framework.

4. Principles of systematic creative thinking. Due to the late start of logistics development in China, the level is low, learning from the advanced experience of developed countries and excellent enterprises, digestion and absorption has been proven successful practices for our use, is a good way to accelerate the logistics management of agricultural enterprises in China. North America, Japan and other countries are not only mature in logistics theory research, but also have a large scale in practice. They have many good practices and successful experiences, which are worth learning and reference. In the study and reference of advanced experience at the same time, must be combined with the actual pioneering innovation, to create a modern agricultural enterprise logistics management framework with Chinese characteristics.

Agricultural products sales network optimization is to realize the agricultural enterprises to research the important topic of modern logistics management, the optimization goal is to achieve the best logistics service, the most efficient transport and distribution services, the lowest logistics cost, the least investment, the most efficient use of social logistics resources and make the activities associated with logistics system of the least cost (Xiang Li, 2011).

The main methods and steps of agricultural sales network optimization can be divided into qualitative analysis of agricultural distribution network planning, basic structure design, and optimization of logistics network and determination of logistics mode. Specifically, it is to use certain research methods to reasonably determine the number, geographical location and operation capacity of agricultural materials and agricultural products distribution centers and agricultural products processing enterprises.

1. Establishment of logistics network system for agricultural products sales. Agricultural products sales logistics network system can also be called agricultural products distribution network system. In this logistics network, agricultural enterprises attach importance to product distribution, that is, to ensure the effective

delivery of agricultural products to customers at the lowest cost and in the shortest time.

2. Comprehensive logistics network system of agricultural products. Modern agricultural logistics should not only attach importance to sales logistics, but also integrate material management and product distribution to improve economic benefits. Therefore, to establish a comprehensive logistics network system integrated logistics network system for agricultural products is characterized by the logistics management at the same time pay attention to material management and product distribution integrated management, but still failed to integrate the information flow and comprehensive logistics enterprises despite the internal integration of logistics management, but there is no horizontal integration management.

3. Agricultural products logistics supply chain network system. In the agricultural enterprises with relatively high production technology, cost reverse control, processing and resource optimization of agricultural products can be carried out to improve the economic benefits of enterprises. Therefore, enterprises must focus on the whole process of logistics activities, including suppliers of raw materials, agricultural products processing enterprises, distributors of agricultural products all accept the management idea of supply chain, establish agricultural products supply chain, and carry on integrated management of supply chain. This has formed the agricultural products logistics supply chain network system.

At present, the development of agricultural logistics is in the initial stage, and there are few large-scale agricultural logistics enterprises. The developing agricultural logistics enterprises also plan and operate independently, resulting in the repeated construction of logistics facilities such as warehouses, cargo stations and fleets, with low scale. To break this pattern, develop agricultural logistics park, accelerate the specialization and socialization of agricultural logistics has become an inevitable choice. Developing agricultural logistics park is beneficial to promote the healthy development of agricultural economy, agricultural logistics park development is beneficial to the restructuring of the agricultural logistics facilities, accelerate the depreciation of old logistics facilities, improve the utilization rate of existing logistics

facilities, logistics facilities renewal of virtuous cycle, and create a good environment for the agricultural logistics infrastructure, promoting agricultural logistics towards efficiency, direction, Promote agricultural economy to develop healthily thereby (Wang Yan, 2008) the development of agricultural logistics park to improve agricultural logistics enterprise core competitive ability of agricultural logistics park for the enterprise provides a fair and reasonable competitive environment, realize the agricultural logistics enterprise's superior bad discard, agricultural logistics enterprises have continuously improve enterprise management ability and the quality of service, maintain its core competitiveness, to avoid agricultural logistics enterprises "conveniently small ',The management situation of attack on all sides.

1. Site selection principles of agricultural logistics parks. Logistics park is the centralized place of logistics enterprises or distribution centers, so it needs to be scientifically selected from the perspective of market economy, because attracting enough capital and enterprises is the key to the successful construction and operation of logistics park. In the early planning of agricultural logistics park, site selection should also be considered as the most important decision. The site selection of the park should be close to major production and consumption places, close to traffic arteries or hubs, use existing facilities, implement the plan in stages at a time, and coordinate with the overall planning of cities and towns, and pay attention to environmental protection.

2. Determine the scale of agricultural logistics park. The determination of the scale of agricultural logistics parks is a very important content in the planning and construction of logistics parks. At present, there are many to determine the main flow zone in our country adopt a two-step approach: first of all, according to the various factors affecting the through put including the total GDP, import and export, etc., in combination with proper mathematical model, estimate the total logistics, and then, according to the relationship between the land use scale and the through put, and the third party logistics development level, it is concluded that the logistics park total scale second, The scale of each specific planning logistics park is determined by apportionment on the basis of the total scale. The apportionment proportion is mainly

based on the proportion of the material flow in each direction, and referring to the experience of foreign logistics park construction scale, using a certain reduction proportion to determine (Tao Xuezong , 2008).

The structure of logistics information system refers to the composing elements of logistics information system, the connection among elements, and the function of elements and connection mode to the construction of logistics information system. The overall structure design of regional logistics information system is an overall design and planning. It is a general design of the overall structure form of the new system and the effective allocation and integration of available social logistics resources according to the requirements of system analysis and the actual situation of logistics organization. The main contents include overall layout structure design (including subsystem division), network structure design, application structure design (that is, application system architecture design), database structure design and computer processing process structure design, etc. This paper carries on the preliminary design to the regional agricultural logistics information system, including subsystem division, network structure, application structure and database structure design.

At present, the key problem blocking the development of agricultural logistics industry is the division of the block, lack of cooperation and union between enterprises and departments. This system is main reason, collaborative management mechanism is not established, fragmented, and regional segmentation of the old management system for agricultural logistics distribution set up many artificial barriers, modern agricultural logistics is to eliminate these obstacles, connects logistics chain of each link, form an organic system, so as to realize cargo and improve logistics efficiency. It can be said that the core of the development of modern logistics industry is how to organize and manage, and these are the government to solve the problem. In order to establish the coordinated management mechanism of agricultural logistics industry, it is necessary to carry out unified planning and special planning for the development of modern agricultural logistics industry, and establish the task sharing mechanism of all relevant departments, so that

all government departments can reach a consensus on the understanding of agricultural logistics thought and the connotation and development of agricultural logistics industry. Then it is necessary to set up a cross-departmental coordination mechanism to strengthen the collaborative work ability between relevant departments.

In recent years, the standardization system of various fields of logistics in China has been gradually established and perfected, but the standardization coordination and unification of agricultural logistics system is still very backward. Therefore, the government should fully start the standardization of agricultural logistics system, and organize and implement the construction of modern agricultural logistics industry according to the requirements of standardization. First of all, we should vigorously promote the standardization of agricultural logistics facilities and equipment, including all kinds of transportation equipment, logistics equipment, packaging, information interface and so on. On this basis, the agricultural logistics terminology, measurement standards, technical standards, data transmission standards, operation and service standards should be accelerated research, as soon as possible to form a unified national or industrial agricultural logistics standards, in line with the international market (Dai Huibin, 2011).

At present, the development of agricultural logistics enterprises in China is slow, but from the perspective of the market, there is a lack of a legal, financial and administrative environment that can make enterprises and customers fully assured, the rights and interests of customers cannot be fully guaranteed, and the development of enterprises cannot be carried out in the environment of free competition. Therefore, in order to quickly promote the development of regional agricultural logistics, it is necessary for the government to formulate a variety of supporting policies and auxiliary policies, establish and improve the relevant legal system to regulate the market circulation order and the operation of agricultural logistics enterprises, guide the development of agricultural logistics industry. Supporting policies for agricultural logistics can include land policy, finance policy, industrial regulation and foreign investment policy, etc., to provide service support system for

agricultural logistics enterprises and provide an equal competition environment conducive to development.

The key to the standardized management of logistics market is to build an orderly and open market environment and promote the technological progress of the logistics industry through equal competition. It is the best choice for the government to regulate agricultural logistics market in its formation period. The government should formulate entry and exit rules, market code of conduct, service standards and technical standards of logistics market.

Agricultural logistics enterprises are the decisive force to promote the development of regional modern agricultural logistics. We should accelerate the support of a powerful backbone enterprise, encourage them to take the road of convolution development, enhance their core business capabilities; At the same time, we should expand the scale structure of logistics enterprises through vertical and horizontal integration. The government should also reorganize and adjust the existing resources of enterprises, promote the integration and restructuring of the agricultural logistics industry, take the road of integration and scale, and form a reasonable flow of resources and an operation mechanism of survival of the fittest. Specific methods include (Yue Pengfei, 2010):

1. Accelerate the construction of socialized logistics distribution centers.

2. Support agricultural products processing enterprises.

3. Accelerate the development of the warehousing industry to the direction of socialization and specialization

4. Transformation of agricultural materials distribution units into professional agricultural logistics enterprises

In the field of logistics, it should be said that Chinese enterprises need to learn foreign management experience will still exist for a long time, especially agricultural logistics. About agricultural logistics consciousness, agricultural logistics management, agricultural logistics technology and so on, in addition to learn by investigation, training, communication and so on, can also through the joint venture and cooperation with foreign agricultural logistics enterprises, foreign direct

investment from the "know-how", brought by the introduction of advanced logistics technology and management level. The entry of foreign direct investment enterprises not only brings advanced technology and management experience, but also brings competition, breaks the balance of regional original market, forces local agricultural logistics enterprises to make more effective use of their own technology and resources, and find and use newer and more effective technology. Therefore, the relevant government departments should formulate a series of preferential policies to encourage foreign enterprises to enter.

We should contact colleges and universities, mobilize them to pay close attention to the development direction of modern agricultural logistics industry, speed up the reform of relevant majors, open more relevant courses or majors, hold various forms of training classes, focus on cultivating urgently needed agricultural logistics enterprise manager, logistics department manager, logistics planning and logistics information system development talents. At the same time, formulate measures to promote the agricultural logistics department personnel to receive training, improve the level of business (Li Jing, 2016).

The development of modern agricultural logistics depends on the perfection of infrastructure. The government should be the main body of investment because the social benefit is higher than the economic benefit. Logistics in developed countries has developed from disordered to highly centralized because of the transfer of investment subjects from enterprises to the government.

1. Increase investment in transportation infrastructure. In recent years, in the logistics infrastructure construction, the extension of lines in the logistics system and the improvement of line level have been rapidly developed, but the construction of nodes in the logistics system has been ignored, often forming the contrast between advanced lines and backward stations. And the station facilities are the basis for the survival of freight enterprises, is the center of transportation organization (Fu Yifan, et al., 2018)

2. Strengthen the construction of information network. In modern logistics, information plays an extremely crucial role. Countries or regions with developed

logistics industry have advanced basic information platforms for support. In order to make agricultural logistics get rapid development, we must achieve mutual interest, business opportunities, vigorously develop the Internet, promote the construction of logistics information. And the information platform as a public system, obviously is also a part of the infrastructure, a logistics enterprise alone can not build a perfect information network, must rely on the government investment to promote the construction of logistics park.

1. Scientific principles. The core competitiveness of agricultural products logistics enterprises is a complex capability system, which involves many influencing factors. Therefore, it is necessary to abstract and summarize the influencing factors in a scientific and standardized way, and select the most representative factors for evaluation.

2. Systematic principle. Evaluation index of core competitiveness of agricultural logistics enterprises (the system should be able to comprehensively reflect the core competitiveness of enterprises. Therefore, in addition to considering each evaluation index itself, we should also consider the interaction and relationship between each index, so as to make a better comprehensive evaluation of enterprise core competitiveness.

3. Feasibility principle. The evaluation of the core competitiveness of agricultural logistics enterprises needs a large number of data, and the data required by each index should be easily accessible and easy to operate. Therefore, the index system should be designed to achieve a moderate number of indicators to avoid overlapping among indicators.

4. The principle of combining quantitative and qualitative. The evaluation of the core competitiveness of agricultural logistics enterprises is complicated, and many factors cannot be quantified. Therefore, quantitative and qualitative analysis should be combined according to the actual situation (Liu Xiaofeng, 2015).

According to the components of agricultural products logistics enterprises core competitiveness, this chapter that evaluation should be the core competitiveness of agricultural products logistics enterprises from the service force, innovation,

marketing power, management power and cultural power five aspects to research, and finally designed a set of the five primary indexes and 22 secondary indicators of evaluation index system. Table 2.9 lists specific indicators.

Table 2.9 - Evaluation index system of core competitiveness of agricultural logistics enterprises

Target layer	Rule layer	Index layer
Core competitiveness of agricultural products enterprises	Service capability|	Network coverage of the service
		Market share
		Demand response speed
		Degree of service differentiation
		Degree of specialization of service
	Creativity	Degree of integration of services
		Advanced technology and equipment
		Technology update speed
	Marketing force	Speed of service innovation
		Brand influence
		Market expansion power
		Customer stability
		Customer satisfaction
		Price attraction
	Ability to manage	Comprehensive quality of management personnel
		Completeness of rules and regulations
		Effectiveness of planned work
		Rationality of organizational work
		External collaboration ability
	Cultural power	Degree of corporate culture harmony
		Recognition of corporate culture
		Degree of corporate culture integration

Source: developed by the author

1. Network coverage of the service. Network coverage index reflects the breadth of logistics services of agricultural logistics enterprises. It is usually measured by the coverage of domestic logistics network, which can be determined by the ratio of the total number of regional logistics services of enterprises to the total number of regional logistics services of industries.

2. Market share. Market share is a direct expression of the competitive advantage of agricultural logistics enterprises. This index reflects the degree of market acceptance of agricultural logistics enterprises, which can be determined by

the ratio of enterprise logistics business income to the total income of the same industry.

3. Demand response speed. Demand response is the response of agricultural logistics enterprises to customer demand, and its speed directly reflects the overall efficiency of logistics enterprises. Demand response speed is the key to the sustainable development of agricultural logistics enterprises, which to some extent reflects the maturity of logistics enterprises.

4. The degree of service differentiation. Differentiation of logistics service is an important strategy for agricultural products logistics enterprises to meet the needs of different customers to the greatest extent by changing the form of logistics service and providing logistics service with different competitors. The higher the service differentiation degree of agricultural logistics enterprises, the more obvious their competitive advantages.

5. Degree of service specialization. The specialization of service is usually expressed by the specialization of logistics service technology. The specialization of logistics service technical means is the most direct external manifestation of logistics service specialization and the guarantee for agricultural products logistics enterprises to form a full range of professional services.

6. Degree of service integration. Integrated logistics service is a process of integrated service management of goods flow, capital flow and information flow in agricultural products logistics enterprises. The higher the degree of service integration, the stronger the logistics service integration ability of agricultural products logistics enterprises, the more competitive advantage.

Creativity:

1. Advanced technology and equipment. The advanced level of technology and equipment reflects the advanced degree of technology and equipment used by agricultural products logistics enterprises in the same industry in China.

2. The speed of technological update. Technological renewal is an effective way to improve the service level of agricultural products logistics. Through technological updating, agricultural logistics enterprises can have strong

technological advantages in the industry, so as to better provide high-quality logistics services for customers and create more added value for customers (Zhu Lei, et al., 2018).

3. Speed of service innovation. The speed of service innovation reflects the speed at which agricultural logistics enterprises constantly launch new service content or service mode according to the rapid changes of customer needs and market in the competitive environment.

Marketing force:

1. Brand influence. Brand influence is the ability of agricultural products logistics enterprises to occupy the market and gain profits, reflecting the degree of preference of agricultural products logistics enterprises in the hearts of customers, usually measured by brand awareness, visibility, loyalty (Gu Wanrong et al., 2017).

2. Market expansion. Market expansion power reflects the ability of agricultural logistics enterprises to open up new markets, which can be determined by the ratio of sales revenue in the current period and sales revenue in the same period of the previous year.

3. Customer loyalty. Customer loyalty reflects the trust and preference of the brand generated after the customer enjoys the service of the agricultural products logistics enterprise, and evaluates the willingness of the customer to participate in the logistics service activities again.

4. Customer satisfaction. Customer satisfaction is the evaluation of agricultural logistics enterprises to meet customer expectations, reflecting the degree of customer recognition of customer value created by agricultural logistics enterprises.

5. Price attraction. Price attraction reflects the attraction of service price of agricultural logistics enterprises to customers, which is usually reflected in that agricultural logistics enterprises create more added value for customers than their competitors to achieve "value for money", so as to attract more customers (Chen Jiatao, 2017).

Management force:

1. Comprehensive quality of management personnel. The comprehensive quality of management personnel is the index of all kinds of quality of management personnel in agricultural logistics enterprises, and is an important guarantee for the level of enterprise management. This index mainly includes the management personnel's educational level, years of working in the industry and management experience.

2. Completeness of rules and regulations. The completeness of rules and regulations is an important factor affecting the management level of agricultural logistics enterprises. This index mainly includes whether the enterprise rules and regulations are standard and complete.

3. The effectiveness of the planned work. The effectiveness of planning reflects the extent to which agricultural logistics enterprises can effectively use their human, material and financial resources to obtain the best economic and social benefits in a certain period according to customer needs and enterprise capabilities.

4. The rationality of the organizational structure. The rationality of organizational structure has an important impact on the sustainable development of agricultural logistics enterprises. This index reflects the extent to which the organizational structure of agricultural logistics enterprises not only meets its own development requirements, but also ADAPTS to external environment changes.

5. External cooperation ability. External cooperation ability is usually expressed as the ability of agricultural logistics enterprises to complete customer orders through resource sharing and complementary advantages, which reflects the ability of agricultural logistics enterprises to cooperate with other enterprises (Rong Aiping, 2017).

Culture:

1. Corporate culture harmony. The harmonious degree of enterprise culture is an important factor to enhance the core competitiveness of agricultural products logistics enterprises, reflecting the harmonious degree of enterprise in interpersonal relationship, moral orientation, social responsibility and other aspects.

2. Corporate culture recognition. The degree of recognition of enterprise culture reflects the knowledge, understanding and familiarity of employees of agricultural logistics enterprises to enterprise culture.

3. Degree of integration of corporate culture. The degree of integration of enterprise culture reflects the degree of integration of values and enterprise culture of employees in agricultural products logistics enterprises.

2.3 Cross-country analysis of competitiveness towards innovation potential assessment for industrious

The differences between countries and different regions are revealed by the global competitiveness report, and the difficulty of building and improving innovation potential and supporting high-level competitiveness is shown by industrial innovation's development. The diversity of research in this field and the increasing trend of paper output is proven to be by bibliometric analysis. Because of the lack of understanding of the relationship between competitiveness' different levels and the need to forecast innovation development and monitor, it is necessary to measure industrial enterprises' innovation potential by transnational benchmarks. The method that is proposed in this paper is a seven-stage algorithm for evaluating innovation potential. Based on the existing GCI method, it has been modified to reveal the trends and differences of innovation development in specific industries. This ranking is conducted for major industrial countries, with the aim of formulating catch-up strategies and revealing the gaps in innovation activities.

The globalization rate, and the 4.0 and 5.0 industry transformations' acceleration, the gap between rich and poor countries, visible earlier became bigger (Jiang, L., et al., 2017) especially under COVID-19 exogenous shock.

Different types' economic entities have urgent needs of forming a new basis for innovations and competitiveness to compete globally. While the belateddest machine-

building tendencies are dislocating the industry, a number of nations are left behind. Pursuant to the study of Maslyak and Dakhno (Maslyak, et al, 2003), as considerably as it can be seen from economic geography data that the countries - machine-building products' major manufactures are the USA, Germany, France, Japan, UK, China, Russian Federation, Ukraine, Brazil. A lot of researches concentrated on the nexus between innovations, economic development, and certain industries' development (for example, IT or ICT technologies) (Pradhan, R. P., et al., 2019). The contributing role of the industrial sector in economic growth and GDP is a well-developed topic (Sterev, N., et al., 2019).There are two unanswered questions: identifying the 'innovation potential' of a country or an entity and increasing this entity's chances in the global competitive game. Reaching this goal may be hindered by a lack of global crises or resources, inflation, national cashes instability, and financial dependence of countries on world donors. There should be geopolitical concerns among local difficulties, the predominance of leading technologies of countries, crises of local governments, and so forth. Given this, it is necessary to introduce economic monitoring of innovation activity of the industrials to analyze their ability to produce advanced outcomes and follow advanced technologies through.

The bibliometric method is an operable toolbox allowing analyzing any research area, placing in the lead tendencies, most influential writers, and find the associations between keywords, research's fields. One of the most trailblazer works is the study of Fahimnia, Sarkis, and Davarzani (Fahimnia, B., et al. 2015), who performed a remarkable investigation of greenish supply chain management as a separate direction in research and offered the roadmap for further investigation in this field. The session «bibliometrics» was originally guided by (Pritchard, A. 1969.), but lately, this type of research has expanded to a lot of different fields, including tourism studies (Soliman, M., et al. 2021) or multidisciplinary research linked to a particular field (Shvindina H., et al. 2019), particular for sustainable innovations (Bilan, Y., et al. 2020) and proved an effective tool in literature review studies.

Using the keywords' innovation potential 'in search' Article title, Abstract, 941 documents were revealed by Keywords' in the period 2010-2021. The refining results

including only articles (not books nor conference materials) ended with 519 documents. As indicated in Figure 2.7, the main countries highly interested in the research area's development were shown by the results' preliminary analysis.

VOSviewer software is proved an effective visualization tool 11 and has been chosen for this study to perform the links between keywords and the research field (Van Eck, N.J. et al. 2013) The papers that were selected at the previous stage allowed to present the network as follows was used in by terms (Fig.2.7).

The bibliometric analysis resulted in topics or seven clusters of the research, that we may use for distinguishing the flows in academic studies that use the most frequent term's significance. So, we may advise that no less than six study regions are interconnected: innovation (purple) is opened by competitiveness & entrepreneurship (light blue), regional development (dark blue), innovative potential (red), technological transfer (yellow), knowledge management (green).

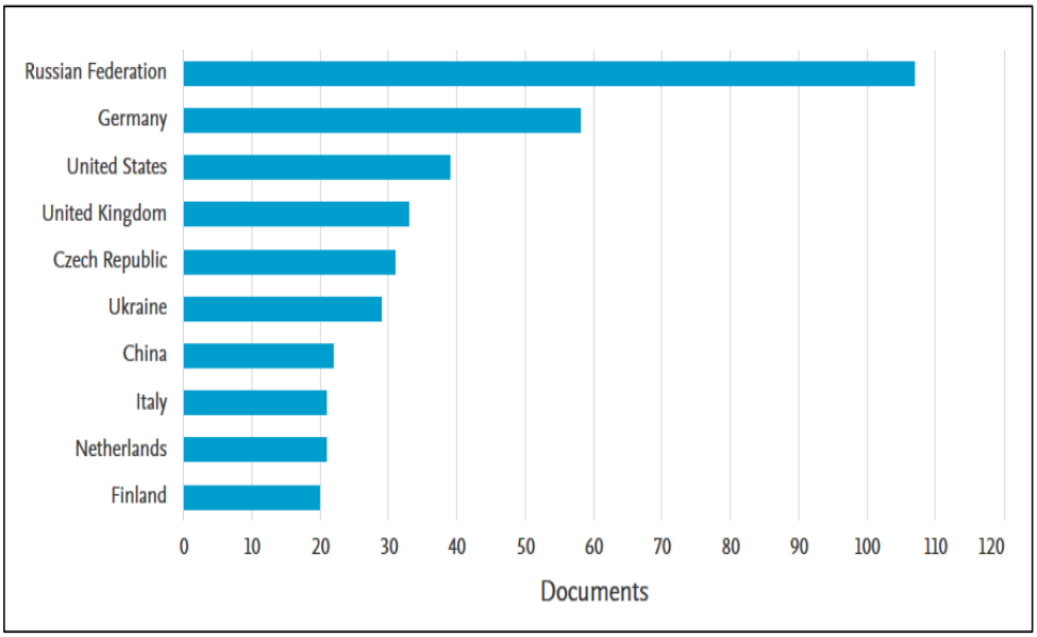

Figure 2.7 - TOP-10 countries, authors from which are contributors to the field.

Source: Scopus Database, constructed by authors for the keyword' innovation potential', 519 documents, 2010-2020)

Innovation potential's investigations may be focused on Europe in general (Marrocu E. et al., 2013) or certain emerging economy (for example, India's economy. The innovation potentiality research varies in scale -- from development of the cluster within the innovations in Ukraine (Kachala T. et al., 2015), to a global cross-country study that compares developing and developed countries (Wu H. et al., 2018).

The current study's another dimension is the innovative development of industrialized countries, which include developing and developed ones. Regarding this matter, the study of less' innovation potential developed the Mediterranean region's European countries for the period 2000- 2012 years should be mentioned. This study was carried out by Salah and Ramzi (Ramzi T. et al., 2018), who identified innovative development's negative factors.

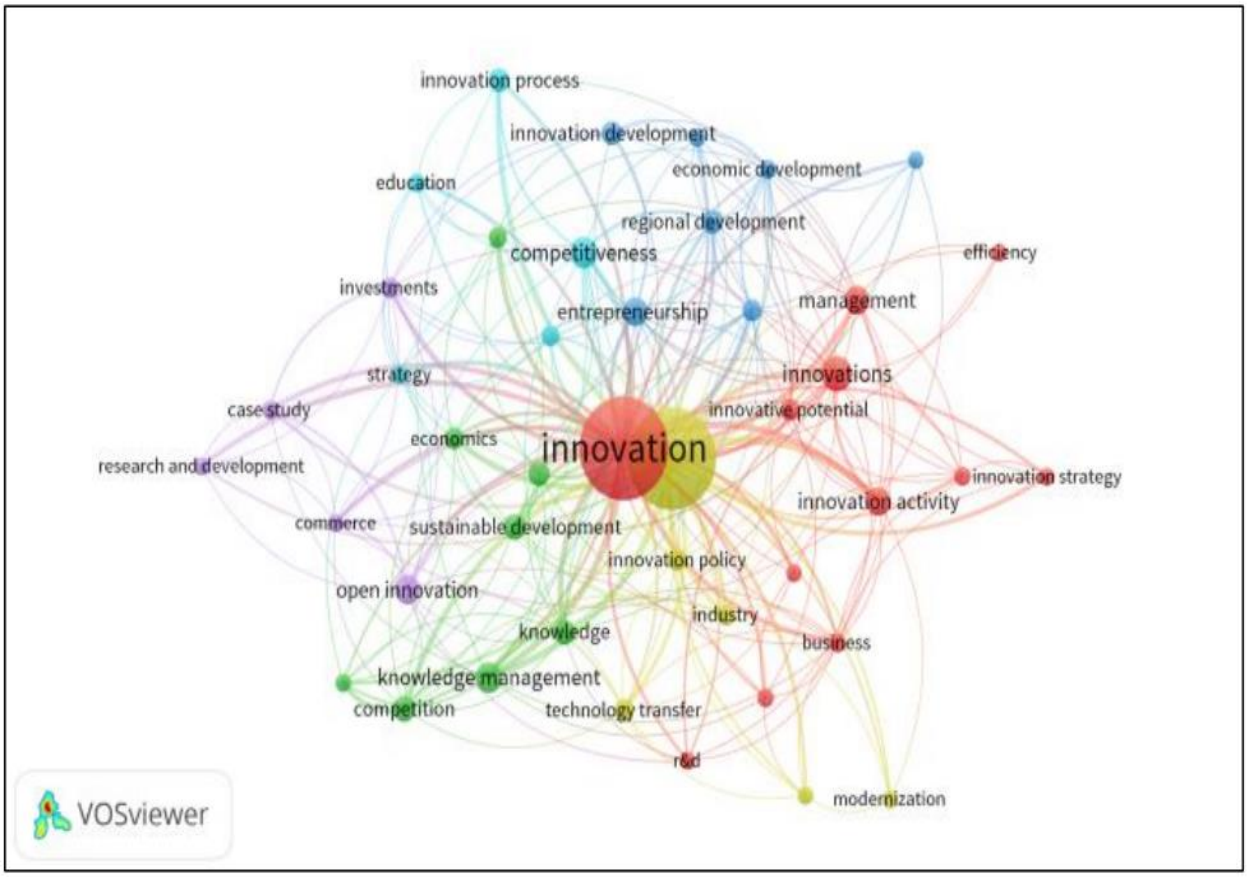

Figure 2.8 - The visualization of the keywords network in the field of research.

Source: Constructed by authors via VOSviewer for the keyword 'innovation potential' (Input data: 519 documents, 2010-2020, Scopus Database, refined).

Researchers Wignaraja, Krueger, and Touzon (Wignaraja, G., et al 2016) studied the productivity of manufacturing networks, profits, and innovative production at Thailand companies and Malaysian by measuring the technological capacities index.

Technology transfer was considered by Skrobska and Ciborowski (Ciborowski, R. et al. 2020) , as well as the effect of the transfer on the economic action of industrial companies using soft modeling's method and study of innovative modifications in the European Union countries.

Another work was completed by Özak, who studied countries' position in innovations' evolution, the distance of pre-industrial technological borders, and the formation of cross-cultural cooperation between countries, which influences the creation of a favorable innovation climate, high productivity, and economic development in the country (Özak, Ö. 2018).

The link was investigated by Gkypali, Kounetas, and Tsekouras between country competitiveness, technology gaps, and level of industrial development, considering the technology gaps in European Union countries' industrial system and the impact of it on competitiveness (Gkypali, A., et al. 2019).

The literature review's another dimension is devoted to the studies that are related to their innovation potential and industrials development. The cost-benefit analysis of government programs that were aimed at subsidizing industry in Sweden was conducted by Carlsson, Eliasson, and Sio (Carlsson, B., et al 2018). The scholars established the correlation between government support for the stagnation and the industry of the Swedish economy. Barzotto, Coro, Mariotti, and Mutinelli (Barzotto, M., et al. 2019) studied national labor resources' use by foreign industrial companies that are innovative products' producers in Italy. International labor migration's issues and its features in the United States were studied by Fajian and Kazakis (Kazakis, P. et al 2017). The researchers identified the gender pay gap in the economy's various sectors.

Deindustrialization development's phenomenon and, as a consequence, the outflow of foreign capital from the chemical engineering and chemical industry was

covered by Lopez (Lopez, M. (2017).). The need for state regulation of chemical industries of Colombia was proven to be by him producing intermediate goods. The research of exportation possibilities of the industrial complex of the world through the establishment of mathematical models in the economy was conducted by Bayar (Bayar, G. (2017).), who developed aggregated models at the global level, and country, sector, and firm degrees. The study conducted by D. Kuvalin, A. Moiseyev, R. Lavrynenko (Kuvalin, D., et al 2018) on the impact of global economic sanctions on the innovative work of machine-building enterprises in the Russian Federation should be considered, as well as Brexit that was an unexpected exogenous shock for countries that were dependent on UK economy.

Unresolved issues. The idea of benchmarking of innovation potential of industrials in a cross-country perspective is offered, considering the findings mentioned above and observed disproportions in industrials' innovative development between countries, and the lack of the link's understanding between competitiveness' different levels.

To evaluate the innovation potentiality of the globe major producers organized by Schwab (Schwab K., 2019).), was used in combination with an method to an apprehension of competitive elements that were constituted by Kononenko (Kononenko I., 1998).). In the prevailing study, the methodology is modified toward innovational likely appraisal only. In order to do that, the subindexes were chose from the 7th, 8th, 9th, 11th, and 12th pillars of GCI (Taraniuk, L., et al 2019) relevant to implementation and innovations manufacture. Using the offered methodology, the assessment of innovation potential for countries -- machine-building products' major manufacturers (industrials)-and that uses Sturges formula enables the countries' grouping by their ranks. This express method comparatively is a simplified approach to GCI; it, however, enables balanced decision-making by different stakeholders at different levels in business, as well as by policy-makers for national and regional programs aimed to support development of the industrials.

The appraisal procedure has eight phases. At the first step, a list of indicators is constituted, which characterize innovation potential's components by subindexes in

diversity and mainstays "Interaction", "Research and development"," Commercialization", "Business dynamism", "Labour market", "Product market "and" Financial system". These subindexes (please see Table 1) were selected by their relatedness to the markets/products/innovation development's main characteristics in industrial countries using previous studies' findings.

Arraying of innovation indicators values is contained by the second stage, making the matrixes of their ranked values (Ri) and countries (Table 2) were selected by their weights (wi) for all. It is worth noting that the weight of each indicator (wi) is determined by experts using the method of the "Hierarchy's Analysis" by Saati with experts' assistance, group of specialists, and scientists of Sumy State University, Sumy National Agrarian University (Ukraine), researchers from Henan University of Science and Technology (China) and Bingham University (Nigeria). At the third step, a weighted value of the innovation indicators is defined for each nation using the method (Kononenko, I. 1998).):

$$\text{Rank} = \sum_i (R_i + W_i) \qquad (2.1)$$

Where Rank is a weighted value of the innovation indicators for the given country;

R_i is the ranked value of the i-th innovation indicator for the given country;

W_i is the i-th innovation indicator's weight for the given country. At the fourth stage, the competitiveness of county in innovation's field is defined as the normalized weighted the innovation indicators' value for the given country, using the approach (Kononenko, I., 1998).):

$$CCI = \frac{Rank_0 - Rank}{Rank_0 - Rank_L} \qquad (2.2)$$

Where CCI is the given country's competitiveness in innovation's field; Rank is the innovation indicators' weighted value for the given country;

$Rank_0$ is the of outsider-country (biggest one); $Rank_L$ is the of leader-country (smallest one).

The fifth stage involves determining risk-taking acceptance's level in business, which affects enterprises' innovative activity in the countries -- machine-building products' major manufacturers, offered earlier (Taraniuk, L.,et al 2019) :

$$RTC = \frac{ER_C}{ER_P} \tag{2.3}$$

Where RTC is business' risk-taking capacity in the given country; ER_C is the attitude to the entrepreneurial risk at current state (c means "current") in the given country; ER_P is the attitude to an entrepreneurial risk at the potentially maximum level (p means "peak").

At the sixth stage, it is offered to determine the level of enterprises' use of disruptive innovative ideas that can affect countries' innovative development positively and help to increase the country's innovation potential as a whole:

$$DCI_I = \frac{DI_C}{DI_P} \tag{2.4}$$

Where DCI_I is the level of use of disruptive innovative ideas by companies in the given country; DI_C is the level of use of disruptive ideas at the c-th (current) state in the given country; DI_P is the level of use of disruptive (innovative) ideas at the p-th (maximum) value.

At the seventh stage, the level of the country's innovation potential - machine-building products' major producer is determined by the formula:

$$IP = CCI \cdot RTC \cdot DCI \tag{2.5}$$

where IP is the level of innovation potential of the given country.

The eighth final stage is a final ranking using Sturges formula enabling to group the countries by innovation potential's level:

$$K_{IP} = \frac{IP_{MAX} - IP_{MIN}}{1 + 3{,}322LGN} \quad (2.6)$$

Where K_{IP} is the Sturges range step, which characterizes the range of criteria values of the indicator of innovation potential; IP_{MAX} is the maximum value of the innovation potential; IP_{MIN} is the minimum value of the innovation; N – number of countries, objects of evaluation.

After determining the levels of the countries' innovation potential - machine-building products' main producers, conclusions were made about the outsiders and leading countries of innovation development. Presentation and results of key research findings the innovation potential's assessment. When assessing the innovation potential of main industrials of the world, the input information is taken from the global competitiveness index report that is performed in 2019, conducted by Schwab (Schwab K., 2019).) and relevant research by Dakhno and Maslyak (Maslyak, P. et al, 2003). Based on the input information of the evaluation's first stage, the indicators characterizing the countries' innovation potential, global industrial producers, are presented as subindexes' system in blocks (Table 2.10).

The second step of assessing the superior matrix of innovation indicators, which determines the value of the rank of each indicator (Ri) and its weight (wi), entailed the expert categories from institutions of Ukraine, China, and Nigeria. Firstly, the weights of indicators of innovation potential for the nations, global industrial producers, and major producers were computed using MS Office Excel to decide the trade fair of the hierarchy of their weight and indicators X1-X15 applying the way of "Hierarchy Analysis" by Saati (Pererva, P., et al.2019). Consequently, the scope of products of indicators X1-X15's correlation [0,00006 - 12288] and the scope of weight of indicators X1-X15 [0,06 – 0,07] was revealed (Table 2.10).

Such values characterize a fairly large sample of their geometric mean value and indicators X1-X15 in the range [0,99 – 1,00], which reduces the range of obtained values of indicators X1-X15's weights, without losing the model's adequacy. It is in a similar way worth mentioning that the ratio of consistency (RC) of this

assessment between expert groups was calculated and had a range of values [0.148 - 0.153] (14,8 – 15,3%) for the observed countries, which is equivalent to its acceptable value RC ≤ 10-20%] (Kulchytska Kh. Et al., 2018), and therefore the hierarchical model is adequate.

Table 2.10 - Innovation indicators, inputs. Rework according to the example

Name of block and subindex	Symbol 1	Unit
Interaction and diversity		
12.01 Diversity of workforce	X1	conventional unit
12.02 State of cluster development	X2	conventional unit
12.03 International co-inventions	X3	Score
12.04 Multi-stakeholder collaboration	X4	conventional unit
Research and development		
12.05 Scientific publications	X5	Score
12.06 Patent applications (per 1 million population)	X6	conventional unit
12.07 R&D expenditures (% GDP)	X7	conventional unit
12.08 Research institutions prominence (1-100)	X8	Score
Commercialization (related to innovations)		
12.09 Buyer sophistication (1-7)	X9	conventional unit
12.10 Trademark applications (per 1 million population)	X10	Score
Business dynamism (related to innovations)		
11.01 Cost of starting a business (% Gross national income percapita)	X11	conventional unit
11.07 Growth of inovative companies	X12	conventional unit
Meritocracy and incentivization (related to innovations)		
8.09 Reliance on professional management (1-7)	X13	conventional unit
Market of inovations (Competition & Financial support related to innovations)		
7.02 Extent of market dominance	X14	conventional unit
9.05 Market capitalization (% GDP)	X15	conventional unit

Source: compiled by authors from the (Schwab, K. (2019)),

Table 2.11 - Assessment of the sub-indexes of the countries' innovation potential, machine-building products' major producers, displayed as value / rank / weight (standardized units) (Take it to the applications)

Indicator		USA	Germany	France	Japan	United Kingdom (UK)	China	Russian Federation (RF)	Ukraine	Brazil
Interaction and diversity, CCI1										
X1	value	5.5	5.3	4.5	4	5.3	4.4	4.9	4.6	4.4
	rank	1	2	6	9	3	7	5	4	8
	weight	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.07	0.07
X2	value	5.5	5.4	4.7	5.1	5	4.6	3.4	3.5	3.9
	rank	1	2	5	3	4	6	9	8	7
	weight	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07
X3	value	12.39	21.4	11.44	5.1	12.44	0.9	0.68	0.53	0.31
	rank	3	1	4	5	2	6	7	8	9
	weight	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06
X4	value	5.4	5.2	4.5	4.7	4.9	4.4	4	3.8	3.7
	rank	1	2	5	4	3	6	7	8	9
	weight	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.06	0.06
Research and development, CCI2										
X5	value	2088	1131	1027.7	919.3	1289	1289	503.3	229.3	493.3
	rank	1	3	4	5	2	2	7	9	8
	weight	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.06
X6	value	143.99	292.1	145.94	490.35	101.76	14.46	3.81	1.56	1.56
	rank	4	2	3	1	5	6	7	9	9
	weight	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
X7	value	2.7	2.9	2.9	3.1	1.7	2.1	1.1	0.4	1.3
	rank	3	2	2	1	6	5	8	9	7
	weight	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
X8	value	4.06	0.8	1.23	1.23	1.23	2.84	0.4	0.04	0.25
	rank	1	4	3	3	3	2	7	9	8
	weight	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Commercialization (related to innovations), CCI3										
X9	value	5.1	4.7	4.3	5.0	4.7	4.5	4.5	4.5	3.6
	rank	1	3	6	2	4	5	5	5	7
	weight	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06
X10	value	2947.15	8745.53	5700.88	1959.89	6560.11	1577.96	437.57	744.49	749.74
	rank	4	1	3	5	2	6	9	8	7
	weight	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06
Business dynamism, meritocracy & incentivization (related to innovations), CCI4										
X11	value	1.0	6.7	0.7	7.5	0.0	0.4	1.1	0.6	5
	rank	5	8	4	9	1	2	6	3	7

Continuation of table 2.11

	weight	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07
X12	value	5.6	5.1	4.6	4.6	4.9	4.4	3.7	3.6	4.2
	rank	1	2	5	4	3	6	8	9	7
	weight	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07
X13	value	5.7	5.3	5.1	5.7	5.3	4.5	4.0	4.1	4.5
	rank	1	3	5	2	4	6	9	8	7
	weight	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.07
Market of innovations, CCI5										
X14	value	5.2	5.2	4.6	5.6	4.6	4.5	3.7	3.6	3.8
	rank	3	3	5	1	4	6	8	9	7
	weight	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
X15	value	150.3	53.9	93.2	113.1	111.7	70.2	38.9	4	38.6
	rank	1	6	4	2	3	5	7	9	8
	weight	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Source: constructed by authors, using (Schwab, K. (2019))– for values; (Marrocu, E., et al. 2013) and experts' evaluation) – for ranks/weights of the indicators.

The results of the next stages (3-7) of the innovation potential assessment for the selected countries are presented in Table 2.12.

Table 2.12- The results for Innovation Potential (IP) assessment, outputs

Parameters	USA	Germany	France	Japan	UK	China	RF	Ukraine	Brazil
Weighted value of the innovation indicators (Rank)	2.07	2.91	4.38	3.88	3.41	5.31	7.46	7.93	7.58
Competitiveness of country in the field of innovation (CCI)	1.00	0.86	0.61	0.69	0.77	0.45	0.08	0.00	0.06
Attitude to an entrepreneurial risk (ERc), (ERp= 5.6) (Schwab,2019, subindex No 11.05)	5.6	4.8	4.2	4.2	4.9	4.5	4.2	4.7	4.1
The level of perception of entrepreneurial risk or risk-taking capacity (RTC)	1.0	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.7
Companies embracing disruptive ideas (DIc),(DIp=5.1) (Schwab, 2019, subindex No 11.08)	5.1	4.8	4.1	3.9	4.6	4.2	3.6	3.4	3.8
The level of use of disruptive innovative ideas by companies (DCI)	1.0	0.9	0.8	0.8	0.9	0.8	0.7	0.7	0.7
Innovation potential (IP) (cross-country ranking)	1.00 (1)	0.69 (2)	0.37 (5)	0.40 (4)	0.61 (3)	0.30 (6)	0.04 (7)	0.00 (9)	0.03 (8)
(for comparison)									
Global Competitiveness Index Score/place)	84 (2)	82 (7)	79 (15)	82 (6)	81 (9)	74 (28)	67 (43)	57 (85)	61 (71)

Source: Scopus Database

It was revealed that the same countries that have a high global competitiveness index have high values of innovation potential (Table 2.12). For instance, the United States leadership is proved (IP = 1.00), and Ukraine is the outsider (IP = 0.00) with the poorest weighted ranking (Rank = 7.93) and the level of competitiveness (CCI = 0.00) compared with the USA as a leader (CCI = 1.00)

The eighth step of assessing involves working out the intervals of standards values of the nation innovation potentiality (IP), applying the Surges formula. The range of standards for the countries' innovation potentiality is worked out by the formula (6) and equals K_{IP} = 0.25 (Table 2.13) that allows designing the further decision-making and final evaluation the four-dimensional basis. There are one leader (USA), three engines (Germany, France, UK, and Japan), fair performer (China), and outsiders, which include Ukraine, Russian Federation, and Brazil, as results show, among the countries that are selected for the analysis by their specialization in industrial production. According to its value, our assumptions about the innovation potential are presented in Table 2.13, but the representative analysis is performed in Figure 2.9.

Table 2.13 - The final evaluation criteria of the innovation potential level of the countries - world's major manufacturers of machine-building products

IP	Characteristics IP according to the criteria range	Group
0.75≤IP≤1.0	Innovation potential of the country is excellent. It characterizes the country's ability to be a leader in innovations, diversity, R&D, market extension, the country launching the new trends, offers advanced technological processes, production upgrades, and dominates globally in the markets.	Leader: the USA
0.50≤IP≤0.75	The country's innovative potential is good. It characterizes the country having innovative development's adequate institutional and financial support, good performance in R & D, despite of moderate risk-taking capacity (France, Japan) or high costs of starting a new business [Japan).	Innovation Engines: Germany, United Kingdom, Japan, France
0.25≤IP≤0.50	The country's innovative potential is fair. It characterizes the country having certain barriers in moderate, low interactions or R&D with international stakeholders for co-invention and co- marketing, business dynamism should be supported by professional management (meritocracy), and market development is far from modern trends.	Fair performer: China
0.00≤IP≤0.25	The country's innovative potential is poor. It means a low level of interactions towards new ideas, their commercialization, poor start-up support infrastructure, and low business dynamism, as well as an absence of low market capitalization and meritocracy.	Outsiders: Brazil, Ukraine

Source: author’s work.

Among the findings, we should mention the big contribution of the RTC (risk-taking capacity) and DCI (level of disruptive innovative ideas' use) into the selected countries' innovation potential level. The level of entrepreneurial risk perception or willingness to take risks and act proactively in business may be explained by the national culture's influence (Kreiser, P. M., et al. 2010) , and might be culturally preconditioned. There, however, are some other barriers, such as avoiding personnel training and using outdated technology, that may lead to low innovation dynamic. There is a hidden source also requiring a well-functioning labour market, and means an ability of the workforces to contribute to the disruptive ideas and innovations. And as a result of an imbalance between talent development and economic growth, China may also be in danger.

Focusing on financial development may lead to an imbalance between human capital investments and technological integration, reflecting in a low level of business dynamism, meritocracy & incentivization. Despite the fact that Russian Federation was the leader in Eurasia by GCI in 2019 according to IP ranking, it is an outsider. It proves again that the sub-indexes selection may play a significant role in the understanding and evaluation process of future strategies for improvements. This study's limitation is the countries' specialization and the preselect ion of the indexes that, in our opinion, must be targeted as vectors for further development in the innovation sphere. The best practices should be considered too. For example, if comparing GCI to the IP ranking, we should also mention Singapore as the country ranking first in terms of infrastructure, health, labor market functioning, and financial system ('diversity and Interaction'), without any industrials in the ecosystem.

The offered methodology is a modified global competitiveness evaluation approach that is aimed to understand competitiveness' particular aspects. It is a tool for decision-making by various stakeholders, including international investors, corporations, technopolises, technology parks, innovation incubators, businesses, government, local authorities, and other concerned stakeholders at the regional and state levels. The offered benchmarking enables the partner detection and vectors development identification for investments in industrials development.

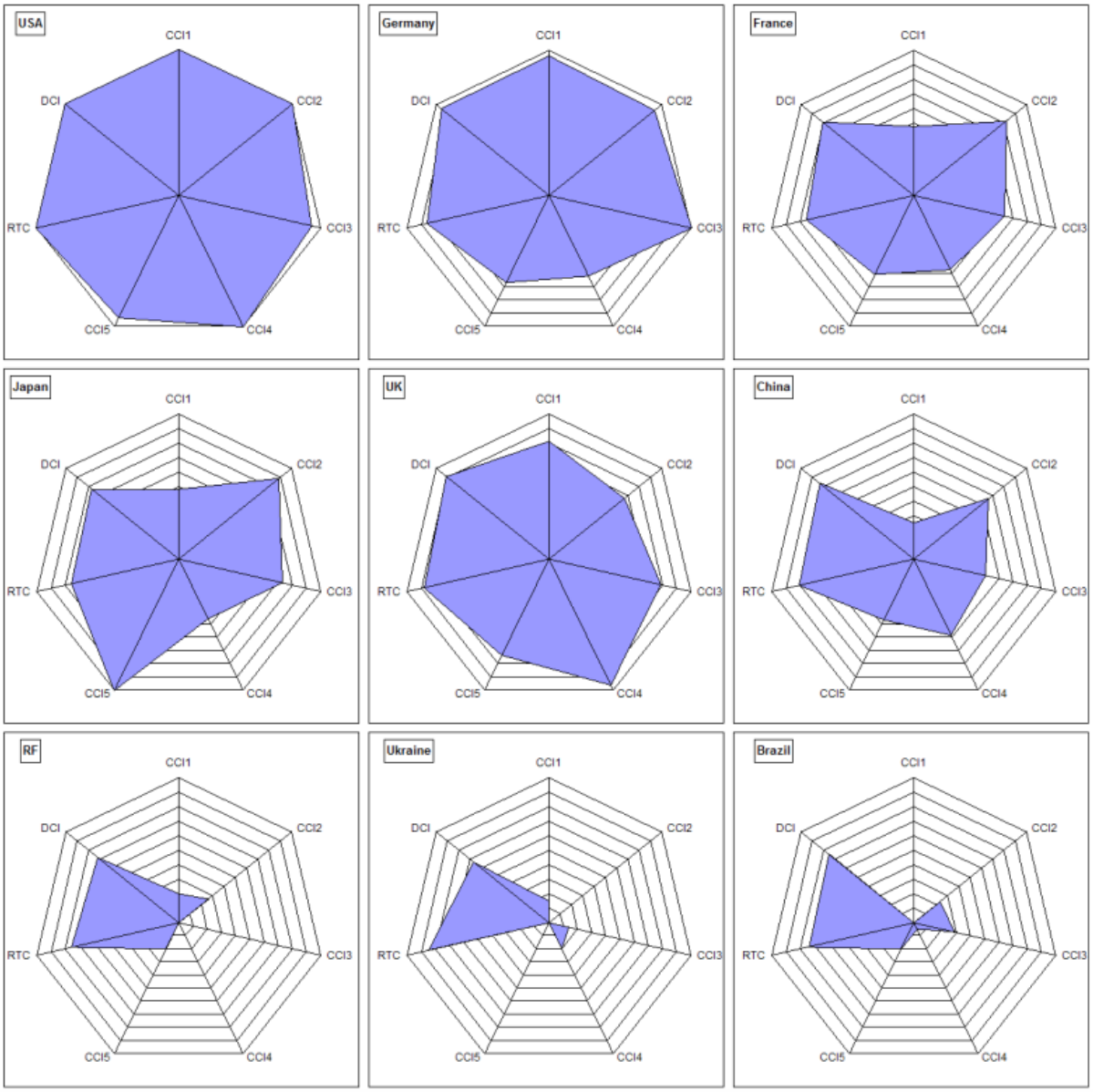

Figure 2.9 - The visualization of the IP and its parameters for each country.

Source: author's work.

Particular decisions can also be made based on the offered approach, for instance, in the sphere of marketing management (Taraniuk, L., et al, 2018). Furthermore, there is preliminary investment evaluation's possibility in different spheres that are based on the level of innovation potential of the country. The improvements may be included by the catch-up strategies within the following fields:

- reinforcement of 'interaction and diversity' aspects including the balance between human capital investments and financial support of cluster development, as well as

cooperation in R&D between countries/ clusters, business hubs co-creation. This strategy is recommended to implement for China, Russian Federation, Ukraine, and Brazil.

- improvements in R&D, namely indirect and direct investments, both private and public, in R&D, institutional support, and funding for scientific outcomes (papers, patents). This strategy is recommended for Ukraine strongly in the first place, and for Russian Federation, Brazil as well. Japan demonstrates the best practice.

- strengthening the commercialization means finding ways to increase buyer sophistication and trademark applications. There should be 'value for money' approach that is implemented; best practices may be borrowed from successful countries. For example, Luxembourg was a leader in 'Commercialization' in 2019, and it's well known for high employment rates in knowledge-intensive services exports and knowledge intensive activities; Ireland and Germany are the exporters of services and high-tech products (Lipkova, L., et al 2016). It is strongly recommended to expand the markets for the products with added value for the countries where this indicator is very low -- Russian Federation, Ukraine, and Brazil.

- to speed up business dynamism and scale up the innovative companies, which mean decreasing of administrative barriers of starting the business, tax relief for start-ups, beneficial conditions for business angels and certain types of companies, like it's already done in Portugal, Belgium, France, Germany, Ireland, UK, etc. Additional measures may include cross-country collaboration, joint R&D projects, and cross-border cooperation in industrial production. (Xiong Yuwei, 2011.)

Conclusions to chapter 2

This section discusses the economically developed areas of the world North America, Western Europe, east Asia representative of the present situation of the agricultural products logistics, expansion and modernization of China in the circulation of agricultural products, logistics organization and management way, logistics facilities and technical level, and the contrastive analysis of logistics system,

its purpose is to summarize the advanced experience of developed countries and regions, It provides enlightenment for the establishment of China's agricultural products logistics model.

Moreover, the construction of evaluation index system of core competitiveness of agricultural products logistics enterprises should follow the principles of scientific, systematic, feasible and combination of quantitative and qualitative. According to the components of agricultural products logistics enterprises core competitiveness, this section that the core competitiveness of agricultural products logistics enterprise evaluation should be from the service force, innovation, marketing power, management power and cultural power five aspects to research, and finally designed a set of the five primary indexes and 22 secondary indicators of evaluation index system.

The methodology for assessing countries' innovation potential has been revised to regroup the GCI sub-indices related to innovation, and to introduce additional indicators of risk-taking capacity (RTC) and companies' use of disruptive ideas (DCI). This allows the design of the seven-parameter evaluation system to gain insight into the factors that further develop the innovation potential of certain countries. Leaders and outsiders were identified, and a standard basis for the innovation potential of these countries enabled them to be grouped on several levels. Innovation potential (IP) evaluation is highly correlated with GCI. On the other hand, it provides new insights for further strategic design to achieve a balance between vectors of innovation potential. Catch-up strategy of industrial upgrading is a topic attracting much attention , the study was limited by the lack of detail on areas of best practice for upgrading national R&D processes, resource reallocation capabilities, and improving productivity, innovation commercialization, and global competitiveness. However, the authors identify development gaps and differences between countries, major manufacturers of machine-made products, and propose strategies and recommendations for improving potential through step-by-step comparison of sub-indices and best practice analysis.

On the other hand, the modernization level of the agricultural product circulation system is also affected by the government's macro and micro policies to a large extent. Agriculture as a basic industry, governments of various countries generally attach importance to the role of policies in agricultural production and circulation. Through the formulation of special laws and regulations to regulate the circulation of agricultural products, maintain a coordinated, flexible and efficient operation state, improve the efficiency of agricultural products trading. At present, China is regulating the circulation of agricultural products, but also need the support of relevant laws and regulations. At the same time, there are also defects such as imperfect subject legal system, imperfect laws and regulations regulating market transactions of agricultural products, inadequate protection of agricultural intellectual property rights, the ability of multiple departments to issue administrative orders, chaotic planning, and a certain degree of confusion and uncomplicated in the circulation market of agricultural products. Therefore, it is urgent to introduce an advance law, integrate existing laws and regulations, improve the legal system, and create a good development environment for the construction of China's agricultural products logistics industry.

1. Summarize the advanced experience of developed countries and regions to provide enlightenment for the establishment of China's agricultural product logistics model. in addition, according to the composition of the core competitiveness of agricultural products logistics enterprises, the construction of the evaluation index system of the core competitiveness of agricultural products logistics enterprises should follow the principles of scientific, systematic, feasible, quantitative and qualitative combination.

2. The methodology for assessing countries' innovation potential has been revised to regroup the innovation-related GCI sub-index and introduce additional indicators of risk-taking (RTC) and use of disruptive ideas (DCI) by firms. New insights are provided for further strategic design to achieve a balance between carriers of innovation potential.

3. The modernization level of the circulation system of agricultural products is also greatly influenced by the government's macro and micro policies. Agriculture as a basic industry, governments of various countries generally attach importance to the role of policies and regulations in agricultural production and circulation.

CHAPTER 3

PRACTICAL PRINCIPLES OF LOGISTIC MANAGEMENT IN THE WORK OF AGRICULTURAL ENTERPRISES

3.1. Organization and implementation of agricultural products logistics and government policies

To realize the modernization of China's agricultural products logistics, there must be strong, advanced organizational security and strong government support. Developing and expanding our agricultural products logistics organization is an important means to improve the international competitiveness of agricultural products in our country. In addition, according to international experience, the government plays a very important role in logistics development, and the government must also develop corresponding logistics policies to promote the development of agricultural commodities in China.

The organization innovation of grain enterprise. Under the planned economy system, state-owned grain purchasing and marketing enterprises have played an important role in guaranteeing national grain security, regulating market demand and protecting the interests of farmers and consumers. At the same time, as the carrier of national macro-control in the state of emergency, the implementation of national policy must be the first goal. Grain management is small, only to carry out large-scale, intensive management, to enhance market competitiveness, and then to improve control.

The reform of state-owned grain purchasing and marketing enterprises is to push forward the strategic reorganization of state-owned grain enterprises in an all-round way according to the requirements of the modern enterprise system, adhere to the principle of grasping large and releasing small ones. With leading enterprises as the core, vigorously adjust and optimize the layout and structure of grain enterprises, completely change the pattern of "small but complete" and "small but scattered",

promote limited resources to gather backbone advantageous enterprises, improve the concentration degree and overall efficiency of the industry, strengthen and cultivate a batch of leading grain enterprises. **(**Xiong Yuwei,et al. 2011**)**

Main problems existing in China's grain enterprises:

1. Overall strength is not strong.
2. The technological innovation capacity is not strong, and the value-added chain of grain processing is short.
3. The degree of industrial organization is low, and the industrial chain is not closely connected.
4. The product grade is not high, and the market development ability is not strong. Products reflect the image of the company. (Chen Xuegang. 2012)

An enterprise wants to win in market competition, must have certain scale, grain enterprise also is such. Relevant experts point out that the competition between enterprises is ultimately manifested as cost competition, and the significance of scale economy lies in reducing costs and improving labor productivity through scale production. We will develop a new model of collectivized operations. Collectivize management is to change the enterprise small and scattered, the state of their own. Through capital operation, and adopt the mode of joint management, equity participation, holding and restructuring, achieve combination of enterprise, has the strong market development ability, processing ability, the ability to store safeguards and industry linkage ability for purchase and sale of food enterprise group company, through the enterprise group company of food enterprise assets and resources integration, unified planning and coordination of the enterprise, Add the purchase, sales, food, and stock management chain link together again, giving full play to the advantages of integral, organized to carry out the grain circulation, formed on the basis of high quality food production base, which is based on farmers, to enterprises, in the grain and oil processing group operation mode, improve enterprise core competitiveness and risk resistance. **(**Zheng Yuanhong. 2013**)**

According to the theory of transaction cost, the transaction cost of individual peasant household must be very high in market transaction. Firstly, as the main body

of the transaction, farmers' knowledge level is low, market information is blocked, and the possibility of blind transaction is the greatest. Second, peasant households are weak and scattered, without the strength to compete with their rivals, and their interests are vulnerable to infringement. At the same time, as "economic men", farmers' behavior is also driven by interests, and they will consider their trading behavior according to the principle of maximizing profits. Thirdly, farmers' transactions are very random, and it is impossible for small-scale agricultural products to have long-term partners. Fourthly, farmers' market transaction frequency is high. The amount of agricultural products produced by farmers is small and there are many kinds of agricultural products, and some agricultural products are not mature at the same time, so farmers have to trade for many times.

At present, the organizational form of "company + peasant household" is widely used in China. Theoretically speaking, if there is no credit failure and contract gives full play to its binding role, "company + peasant household" is an ideal model. Because, the company as an independent legal entity of the leading enterprises with financing, asset integration, market operation and other modern enterprise management capabilities, in the development of the market, the establishment of a famous brand has advantages. But in real life, interest is higher than credit, and the behavior of breaking contracts is very common, which makes it difficult to achieve a win-win outcome of the "company + farmer" model.

Domestic and international practice has proved that it is difficult to realize the connection between the scattered farmers and the large market and circulation at home and abroad, and the reasonable interests of farmers are difficult to be guaranteed. For example, the export price of China's products with cost advantages, such as garlic and fruit juice, is less than 1/10 of the international market, and the reasonable profits of farmers are transferred to foreign importers or wholesalers. Therefore, it is necessary to set up peasant cooperative economic organizations on the basis of farmers' willingness, organize scattered and small-scale peasant households, improve the exchange conditions of agricultural products, form agglomeration economy of scale, and obtain economic benefits of scale.

The following measures can be taken to improve the degree of organization of peasant households:

Vigorously developing farmers' cooperative transportation and marketing organizations We should vigorously develop farmers' cooperative transportation and marketing organizations, so that farmers can organize themselves to enter the market, so as to solve the problem of information asymmetry in production and business activities of each household, difficulty in entering the market, high risks, multiple links of product transportation and marketing, and high costs, which lead to farmers' increasing production but not increasing income. .(Hu zhijun, 2012) Cultivate and develop agricultural products logistics intermediary organizations that represent farmers' interests (Li Jinye. 2006)

Adam Smith said in The Wealth of Nations, "The greatest increase in the productivity of labor is the result of the division of labor." He believed that division of labor and specialization were the cause of wealth growth, and the advantage of division of labor was to obtain division of economy and specialization economy, so as to improve production efficiency. The theory of division of labor and specialization in emerging classical economics holds that division of labor and specialization can accelerate the accumulation of knowledge and bring increasing returns. However, coordinating the division of labor also needs cost. The deepening of the division of labor leads to the increase of transaction costs, which depend on the efficiency of the transaction mechanism. The dilemma conflict between the benefits of division of labor and the increase of transaction costs is basically the end of the evolution of division of labor. In this dilemma, the deepening of division of labor depends on the relative comparison of transaction costs and benefits of division of labor, showing a spontaneous evolution process. Under the guidance of this theory, modern enterprises pay more and more attention to the play of their own advantages, constantly strengthen their own core competitiveness, and use the form of social division of labor to outsource non-core businesses, including a large number of logistics outsourcing to third-party logistics enterprises. Practice has proved that the use of third-party logistics services can bring the following benefits for enterprises: reduce

logistics costs; Expand the business capacity of enterprises; Concentrate and strengthen your main business; Shorten shipment to delivery time; Increasing vehicle efficiency and reducing fuel consumption costs; Thorough implementation of quality management; (Liu Shengchun. 2013)

Logistics alliance is to achieve better results than logistics activities alone, logistics enterprises and logistics services between the formation of mutual trust, risk sharing, profit sharing logistics partnership. The uncertainty of the transaction and the variability of the market are closely related to the limited rationality and opportunistic behavior of the transaction subject. It is impossible for both sides of the transaction to have a full insight into the future and deal with the changes that will happen in advance by setting clauses in the contract. If the information of both sides of the transaction is not symmetrical, it is difficult to avoid the opportunistic behavior of one side. However, the alliance organization can obviously reduce the occurrence of such situations instead of market transactions. The higher the transaction frequency, the higher the transaction cost, the higher the transaction frequency, the higher the transaction cost. By seeking an effective organizational form to eliminate the negative impact of high transaction frequency, alliance can be considered as an institutional arrangement, because as a long-term contractual arrangement, logistics alliance tends to reduce the transaction costs borne by unit exchanges. (Ma Yufang, et al. 2013)

For the development of logistics industry, governments are involved, the difference lies in the degree of involvement is different. Taking a look at the actions of various governments, the government mainly adopts policy measures to guide and promote the development of domestic logistics and strengthen the macro-guidance and regulation of logistics development. The government's role in logistics development mainly includes the following aspects:

1. To be included in the overall strategic objectives of economic development, or to formulate logistics planning, or formulate industrial policies for logistics development
2. The government supports the development of logistics industry and related enterprises

3. Coordinate the standardization construction of logistics system
4. The government provides various services for the development of logistics
5. Strengthen the management of logistics (Zhang Yu, 2013)

Policies on the development of agricultural products logistics in China. In 2013, with the consent of The State Council and jointly issued by the State Planning Commission, the State Economic and Trade Commission, the Ministry of Agriculture, the Ministry of Finance, the People's Bank of China and the State Administration for Industry and Commerce, several Opinions on Accelerating the Construction of Circulation Facilities for Agricultural Products made a comprehensive deployment for the construction of circulation facilities for agricultural products in China in the future. The Opinions put forward that the goal of China's agricultural product circulation facilities construction is to improve the functions of wholesale markets, improve the grade of wholesale markets, and build a number of backbone wholesale markets with reasonable layout, advanced trading methods, complete functions, sensitive information, safety and health in large and medium-sized cities and major producing areas of the country. We will actively develop new circulation organizations such as chain supermarkets and direct distribution, and establish a multi-level, multi-format and multi-mode agricultural product market system. Accelerate the construction of logistics facilities such as storage, processing and transportation of agricultural products, and establish a modern agricultural products logistics service system; Reform the current operation and management systems of wholesale markets for agricultural products, and establish a mechanism that mainly relies on enterprises to operate, invest and develop themselves under the guidance of government policies and financial support. Gradually form the backbone wholesale markets of the country as the core, supplemented by chain supermarkets and other circulation methods, supported by modern logistics service system, supported by modern trading, settlement, information, detection, storage, logistics and other technologies, and guaranteed by good enterprise operation and capital investment mechanism. Stable, orderly, large-scale agricultural product dealers as the main body of the modern agricultural product market circulation system. In the same year, the

Ministry of Commerce promulgated the "Opinions on Further Doing a Good Job in the Circulation of Rural Commodities", taking the development of agricultural products logistics as the focus of the current circulation of rural commodities. In February 2014, the First document of the CPC Central Committee, Opinions of the CPC Central Committee and The State Council on Policies to Increase Farmers' Income, once again made it clear that: We will speed up the development of chain, supermarket and distribution operations for agricultural products, encourage places where conditions permit to turn urban farmers' markets into supermarkets, support leading agricultural enterprises in opening supermarkets for agricultural products in cities, and gradually extend their networks to urban communities. We will further strengthen the construction of wholesale markets in producing and selling areas, and create conditions for the development of modern logistics. It can be seen that the CPC Central Committee and The State Council attach great importance to the logistics industry and the urgency of accelerating the development of China's logistics industry. In 2014 to further promote the development of China's modern logistics industry, as soon as possible formation chang its flow, fast on time, reasonable economy, user satisfaction of socialization, specialization of modern logistics service system, China introduced a further eight measures to promote the development of modern logistics, the eight measures including: standardize enterprise registration Qian ZhiXing approval; Adjusting some administrative matters; Improve the tax management of logistics enterprises; Accelerate the introduction of competition mechanism, establish a unified open, fair competition, standardized and orderly modern logistics market system; Strengthening charge management; Actively promote the opening of logistics market; Improve customs clearance environment; Optimize traffic management of urban distribution vehicles. To solve the problems existing in the actual operation of logistics enterprises. (Chen Peng, 2012)

First, do a good job in the unified planning of agricultural circulation facilities to prevent repeated construction. Without planning, the development of the market will form vicious competition. We should encourage competition within the market and not develop competition between markets. Some markets spend tens of millions

of yuan a year in competition. How much will stall operators pay you if they run a business here for a year? How much will they pay you if they sell a cart of vegetables here?

Second, we will encourage multi-channel nongovernmental funds to invest in the development of a circulation system for agricultural products. We should give priority to planning and land acquisition, give preferential treatment to some taxes and fees, and take various forms to encourage government, collective and individual funds to invest in the construction of agricultural products circulation system. Encourage cross-regional development of logistics distribution and chain operation. We should reform the current management system of wholesale markets, establish an operation mechanism in which those who invest benefit, and make markets legal persons that operate independently and take responsibility for their own profits and losses.

Third, we will continue to implement the policy of bank loans and fiscal interest discount. This policy was introduced in the ninth five-year Plan and should be continued in the future. It is relatively easy for banks to make loans with discount interest.

Fourth, increase direct government input and support. The state allocates a certain amount of budgetary funds every year to subsidize the construction of agricultural product market information systems, pesticide residue monitoring systems, electronic unified settlement of accounts, roads, sites, pollution treatment and other infrastructure, and local governments must give a certain amount of supporting funds to projects supported by the State. According to this article, in April 2013, the National Development and Reform Commission issued the "Notice on Printing and Distributing the Opinions on the Implementation of the Pilot Project of Agricultural Wholesale Market in 2013".Each province will first apply for three projects, and the state will arrange 400 million yuan of Treasury bonds to support them. The investment plan has been handed down. We will focus on 181 projects, most of which are markets and a small part is enterprises that store and keep fresh agricultural products. The amount of state aid should be as much as 15 million, or at

least 3 million. Local governments should provide funds of a certain scale, and then give support from other policies to promote construction. Support activities like this should not be done with just one pilot program, but should be intensified. (Song Yao, et al. 2012)

Fifth, expand the opening of circulation facilities. We have already made commitments in the distribution and logistics industry under the WTO treaty, and this commitment can be implemented in advance in the circulation market of agricultural products. It can promote the improvement of our management level.

Sixth, rectify the wholesale market transport link charge. A prominent problem reflected in the development of wholesale markets is industrial and commercial charges. The competent government departments should rectify the charges in the wholesale market of agricultural products, reduce the excessively high charges and cancel all kinds of illegal charges. To merge charging items, solve the problem of multi - charge. In addition, from promoting the development of modern logistics industry to charge a series of links such as research. Including highway barrier-free toll, reduce the level of toll. At present, China's highway toll accounts for 30%-40% of the value of goods, compared with foreign freight is too high. Expressways were developed, but transportation costs were too high. This is unfavorable to cross-region flow, long-distance storage, cold storage and marketing, which should be solved in policy. (Yang Guangning, 2009)

Seventh, cultivate agricultural logistics talents. The lack of talents is the biggest restricting factor for the development of agricultural products logistics in China. The lack of logistics management and management talents is seriously restricting the scientific operation of agricultural products logistics. Modern logistics is accompanied by the development of information technology and the innovation of modern logistics technology, urgent need to adapt to the development of The Times, especially to adapt to the WT0 requirements of agricultural products logistics management and management of specialized talents. At the moment, talent is in short supply. In the United States, many famous colleges and universities set up logistics management major, and set up logistics courses for students majoring in business

administration and related majors. Under the organization and advocacy of the Logistics Management Committee of the United States, the logistics in-service education has been carried out comprehensively, and the professional qualification certification system of the Logistics industry in the United States has been established, for example, warehouse engineer, distribution engineer and several other positions. All logistics practitioners must receive vocational education and pass the examination to obtain the above engineer qualification before they can engage in the relevant logistics work. To solve the shortage of logistics talents in China, only the government's education system can solve the problem. In higher education, various majors related to logistics should be set up to implement the logistics professional qualification certification system. To ensure the delivery of qualified personnel for the enterprise. (Wu Zhihui, 2007)

3.2. International aspects of the assessment of logistics potential of the main countries of agricultural production

Under the statuses of ceaseless market variations in requirement and supply in the food market, a lot of world leaders are paying attention to their logistics potential's development. On the one hand, it is aimed at increasing inter-state cooperation's level in the agrarian sector, which characterizes the processes of products' of agriculture internationalization between countries. On the other hand, it can lead to an rise in the efficiency of managing business processes in the agrarian companies due to the introduction and the intergovernmental partnership of innovative technologies in the complex of agriculture. Having analysed the works of P. Ceniga, V. Sukalova (Ceniga, P. 2015) statistical information of the Global Competitiveness Index's analytic research made by K. Schwab, (Schwab, K. 2018.)we noticed the signs that may affect the level of the countries' logistic potential negatively engaged in agrarian production. They are as follows: decline in the food

production in a lot of countries due to natural causes (African countries such as Rwanda, Zimbabwe, Zaire, Central African Republic, the Congo's democratic republic, Mozambique) , political circumstances (Latin American countries: Venezuela, Peru) , military events (Asia's countries: Syria, Afghanistan, Palestinian autonomy) , decline in the land of agriculture use efficiency, as a result of neglect and erosion (Asia: Mongolia, China, Africa: Sudan, Ethiopia, Egypt, Algeria) , climate change in the countries because of global warming (Latin America, Oceania countries and Africa), trade wars between countries (implementing economic embargo on services and goods, as an example of difficult trade relations between Russia and Ukraine).Considering these signs, there is a need for the development of the logistics potential of the world main countries of production and its evaluation of agriculture as an element of the implementation of food monitoring's system, the pledges of increasing food security's level in the world's a lot of countries and the adoption of effective management decisions at the state and interstate levels in the field of productions of agriculture logistics management. On the other hand, the assessment of countries' logistics potential includes the establishment of interaction's level between countries in productions of agriculture field, trade of agriculture and warehousing, which leads to the strengthening of logistic links between countries and increases the level of economic efficiency of management of agrarian industries' business processes, as well the introduction of advanced technologies of the leading countries in the agrarian complex of other countries, which is the sign of productions of agriculture internationalization. This scientific research's main purpose is to improve methodological and theoretical approaches to international aspects of assessing the logistic potential of productions of agriculture world main countries.

The basis for the implementation of the methodological part of this scientific research was the method of comparative analysis that was used in the main trends' formation in productions of agriculture development in the countries across the management and world of its logistics flows; factor analysis' method used determining negative and positive factors influencing the product development of the world countries' agrarian sector in; an improved method of recruitment of competitive

elements in the assessment of logistic potential of the world countries, which includes the assessment of the agrarian countries' logistic management in blocks: product safety, internationalization of logistics and production, business process management; the Sturges method used determining the criterial basis of the levels of the countries' logistic potential across the world, which are the main agricultural producers in; the method of generalization that is used for the main approaches' development to increase internationalization's level and efficiency of the business process agrarian industries' management in the countries across the world. In assessing the logistics potential of productions of agriculture world main countries, K. Schwab's study of the analysis of the world countries' Global Competitiveness Index was used. The world main countries of agricultural production according to the scientific research of S. Simpson were the assessment's object.These countries are the USA (grains, corn, and soybean), Germany (vegetable crops, beans), Canada (grains), China (wheat, rice, corn, and vegetable crops), Russia (wheat, oats, and beans), India (cereals and vegetable crops, beans, millet), Brazil (fruit crops), Ukraine (wheat, oilseed crops, oats, rape, and corn), Nigeria (fruit crops, millet) (Simpson, S. 2012.), (Kononenko, I. 1998.)

An appraisal of the logistical management of the nations across the globe was done by K. Schwab calculating the countries' Global Competitiveness Index across the world. His research's main point is to calculate the countries' Global Competitiveness Index across the world, which makes it possible to identify the outsiders and leaders of economic development at the macroeconomic level.(Schwab, K. 2018.)

The analysis of the Global Competitiveness Index of the countries across the world provided the indicators to be used as a measurement tool for assessing the logistic potential of productions of agriculture main countries.(Kononenko, I. 1998.)The method of recruitment of competitive elements proposed by I. Kononenko was improved by generating criterial indicators in blocks: product safety (quality of land management, ownership right, prevalence of non-tariff barriers, market capitalization, application of trademarks); internationalization of production and

logistics (international joint inventions, simplicity of hiring the foreign lab our, air transport services' efficiency, rail transport efficiency, traffic communication index); business process management (effects of the market dominance volume, reform process, productivity, growth of innovative companies, cooperation between a lot of stakeholders and payment) when calculating the logistics potential of productions of agriculture main world countries in order to identify the countries-outsiders and countries-leaders in the logistic management.

The measurement instruments also contain the developed criterial foundation of the logistic potentiality of the main nations of agricultural output, which takes a six-level ranking of the countries' logistics potential at corresponding degrees. Making is allowed effective managerial decisions at the interstate and state level in terms of logistics management by formation of the critical basis of the countries' logistics potential. S. Thiede, A. Turetskyy, A. Kwade, S. Kara, S. Herrmann, carried the formation of their values and mufti-criteria indicators out in the system of integral assessment of the work of manufacturing companies. (Thiede, S. et al. 2019)

An algorithm will be conducted by us for assessing the countries' logistics potential across the world using an advanced methodological approach to a set of competitive elements. To do this, one needs to check over the procedure for following this methodological method through in more particular.

At the inaugural step of this methodological method, a list of indicators characterizing incoming analytic information is made. In this instance, this is the information for analyzing the logistic management of the main countries of agricultural output of the globe, which is offered in Table 3.1.

At the second step of this methodological method, a matrix of deciding the ranking of the countries' logistical management indicators past the globe is constituted. A superior appraisal of each indicator is executed in the blocks "goods safety", "Internationalization of logistics and production"," Commerce process management", where, based on rank values indicators (Table 3.1), the positions of each indicator (Rij) are decided. In this instance, the weight of each indicator (Vagai) is constituted, which is decided by expert evaluation's approach. In this scientific

study, indicators' weight was determined by involving various expert groups of representatives, namely: specialists of Sumy Chamber of Commerce and Industry (Ukraine); University (Ukraine) and Henan University of Science and Technology (China) is Stated by scientific experts of Sumy's international economic relations.

Table 3.1 - Comparative analysis of the logistic management of the main countries of agricultural production of the world, in 2018, c.u. / location (based on (Schwab, K. 2018.) (Simpson, S. 2012.)

Names of economic indicators	USA	Germany	Canada	China	India	Brazil	Ukraine	Nigeria
Product safety block								
Quality of land administration	17,6	22,0	21,5	18,3	8,2	13,8	14,5	7,4
Property rights	5,8	5,5	6,1	4,6	4,8	4,0	3,3	3,7
Prevalence of non-tariff barriers	5,3	5,1	4,5	4,5	4,5	3,4	4,1	4,6
Market capitalization	145,4	48,3	116,1	65,6	72,8	34,6	20,3	9,6
Trademark applications	2890,5	8457,4	1904,5	1561,7	200,9	699,0	653,8	111,52
Internationalization of production and logistics block								
International co-inventions	12,3	21,26	15,93	0,99	0,38	0,30	0,50	0,01
Ease of hiring foreign labour	5,0	5,0	4,0	4,5	4,4	3,4	4,1	4,5
Efficiency of air transport services	5,9	5,6	5,4	4,6	4,8	4,4	4,0	3,1
Efficiency of train service	5,7	5,5	4,3	4,5	4,5	2,5	4,3	1,7
Road connectivity index	100	93,5	93,4	88,4	62,0	63,7	72,7	66,6
Business process management block								
Efficiency of the clearance process	3,8	4,1	3,6	3,3	3,0	2,4	2,5	2,0
Market dominance volume	5,7	5,5	4,5	4,5	4,6	3,8	3,3	3,4
Payment and productivity	5,8	5,3	5,0	4,6	4,7	3,4	4,2	3,6
Growth of innovative companies	5,8	5,4	4,7	4,4	4,7	4,1	3,5	4,1
Multi-stakeholder collaboration	5,8	5,4	4,6	4,4	4,6	3,7	3,7	3,1
Integral assessment								
Global Competitiveness Index (assessment/location)	85,6 (1)	82,8 (3)	79,9 (12)	72,6 (28)	62 (58)	59,5 (72)	57 (83)	47,5 (115)

Source: author's work.

At the third stage, a weighted assessment of each indicator of the corresponding block of the countries' logistic management is determined considering each indicator's importance in assessing the countries' logistics potential by the formula:

$$Rang_i = \sum R_{ij} \cdot Vaga_i, \quad (3.1)$$

Where $Rang_i$ is the weighted assessment of the i-th indicator; $\sum R_{ij}$ is the weight of all indicators of the logistic management of the j-th country; $Vaga_i$ is the weight of the second indicator of logistics management;

At the fourth step, based on a well-balanced appraisal of the logistical management indicators of the nations, the leader nations (L) and outsider nations of the logistical management (A) are decided.

At the fifth step, the range of the distance between the head nation and the more external nation of the logistical management is decided by the formula:

$$D_v = Rang_A - Rang_L, \quad (3.2)$$

Where D_v is the range of the distance between the leader country and the outsider country; $Rang_A$ is a weighted assessment of the out sider country logistic management; $Rang_L$ is a weighted assessment of the leader country logistics management;

At the sixth step, the country's competitiveness in logistical management's sphere is worked out pursuant to the formula:

$$KSOP_{ia} = \frac{(Rang_A - Rang_I)}{D_v},$$

(3.3)

Where $KSOP_{ia}$ is the competitiveness of the i-th country according to the first sphere of logistics management; $Rang_I$ is a weighted assessment of the country, an entity of the logistic management.

The seventh and eighth stages of this evaluation characterize the improvement of the methodological approach of a set of competitive elements.

At the seventh stage, the appraisal is used to decide the level of insight of the risk of entrepreneurial actions, which is connected with the logistical management closely in ago-industrial complex of the country, applying the formula:

$$RKS_i = \frac{ER_c}{ER_p}, \quad (3.4)$$

Where RKS_i is the level of perception of the risk of entrepreneurial activities of the country; ER_c is the attitude to the entrepreneurial risk of the c (current) value; ER_p is the attitude to the entrepreneurial risk of the b (best) value.

At the eighth step, the level of the country's logistics potential is evaluated by the formula:

$$LP_i = KSOP_{ia} \cdot RKS_i, \quad (3.5)$$

Where LP_i is the level of logistics potential of the i-th country?

At the assessment's ninth stage, to find out logistics potential's levels, it is requisite to build a scope of logistic potential values dividing each of its degrees applying the St Impulses approach by the formula:

$$k_{LP_i} = \frac{LP_{i_{max}} - LP_{i_{min}}}{1+3{,}322 \lg N} \quad (3.6)$$

where k_{LP_i} is the St urges coefficient, which characterizes the range of critical values of the logistic potential of the i-th country; $LP_{i_{max}}$ is the maximum value of the logistic potential of the i-th country; $LP_{i_{min}}$ is the maximum value of the logistic potential of the i-th country; N is the number of countries, objects of assessment.

Evaluating the logistics potentiality of the principal nations of the world's agricultural production, taking into consideration, it is requisite to differentiate the principal indicators characterizing the countries' logistics potentiality. The indicators are decided in product safety's blocks, internationalization of output and logistics, business process management characterizing the processes of influencing the countries' logistical management, when allocating nations by ago-market size's criterion, the level of export of agriculture and the figure of consumers in the nation pursuant to the study of S. K and Simpson. Schwab (Table 3.1).

After a comparative analysis of logistics management of agricultural manufacturers in the world, certain conclusions ought to be created about the tendencies of the countries' logistical development in these blocks. Therefore, in the provision Safety block, Russia is the head (26 c. u.) upon Land Administration indicator's Quality, which is an important component of the expeditious domain use for production of agriculture. This is due to the country's large territory, favourable

climatic conditions for the cultivation of a lot of types of agricultural crops with high fertility of the land in the European zone increasing production efficiency's of agriculture level. On the other hand, Nigeria (7.4 c. u.) is an outsider country in terms of Land Administration's Quality, due to the unfavourable tropical climate, land erosion caused by drought, low water resources, lack of logistics infrastructure (terminals of agriculture, processing centers), which reduces productions of agriculture effectiveness significantly.

Being concerned with the block of Internationalization of Production and Logistics, attention ought to be attended to the indicator of Multinational co-inventions, which characterizes the co-operation between nations in trade goods output, including the ago-industrial complex. Therefore, Germany is the chief nation upon this indicator (21.26 c. u.), which characterizes this nation as a chief, with respect to the creation of joint centres for equipment's of agriculture research firms (spin-offs), and the more external nation is Nigeria (0.01 c. u.), which possesses a very down percentage of the output internationalization. This owning to the inefficient state policy of appealing to alien capital letter, the instability of the economic and political system, which gives rise to production's de-nationalization and its backwardness from the advanced tendencies in agribusiness evolution. Besides, a logistical component in production's internationalization is the same worth noticing that. Therefore, pursuant to the way Connectivity Index, the America is the leader (100 c. u.) due to efficient traffic between agrarian centres and cities, which raises logistics management's degree in the agrarian part (transport of agricultural goods from the manufacturer to the consumer). India, though, is an outsider (62 c. u.), upon this indicator, which is conditioned by transport links' low level between agrarian centres owning to unusual forest virginity (tropical forests), earth ways, which, throughout the seasonal rains, gives rise to a reduction in logistic flows, deferred delivery of agricultural goods between manufacturer and consumer, producers' of agriculture economic costs.

Market Dominance Volume is one of the important indicators for producers of agriculture in Business Processes block's Management, as this indicator characterizes

market segmentation's level by the products of agriculture and producer in this segment of the market. The leader country upon this indicator is the US (5.7 c. u.) due to high competition in the agricultural production of this country between the national commodity producers and their number in the market segment. An outsider country is Ukraine (3.3 c. u.) due to the high import component of agricultural products in the market, the ineffective state policy of protecting the national producer, lack of the collected products' of agriculture warehouse logistics.

The analysis' conclusions allow stating the necessity of introduction of productions' internationalization and rise of efficiency of products' of agriculture business process management in the countries that are located in the zone that is closer to the outsider countries, in order to increase logistic management's level in the given countries. After logistics' comparative analysis management of the world countries in the blocks of Product Safety, Internationalization of logistics and production, Business Process Management, positive and negative factors influencing countries' product development in the agrarian sector should be distinguished. Some positive factors include:

-commodity markets' globalization, which enables to raise the level of products' of agriculture competitiveness in national markets;

- introduction of technological and scientific progress by the leader countries, which makes it possible to use leading innovative technologies by other countries and to increase logistics management's level in the agrarian sector;

- a concern of a lot of countries at the interstate level about increasing food safety's level, as a factor deceleration of the processes of water scarcity and food, especially in the countries of Latin America and Africa;

- the sustainable development's formation processes in the countries' agricultural production as a result of environmentally-oriented agricultural products' production with high value-added.

The negative factors influencing the countries' product development in the agrarian sector include:

- climatic conditions for production of agriculture (drought, water scarcity, natural disasters);

- The ineffective policy of the developing country governments in terms of the logistic management due to the economic and political crisis, military actions;

- Governments' focal point on economic enrichment rather than on the country's sustainable evolution. The consequence is the establishment of home replacements (soybean food, fast food goods), a excellent level of low-quality importations, and GMO goods.

It is worth noticing that the publications of the factor impact on Pakistan's food security were learnt by Abulah, D. Zhou, T. Shah, S. Ali, V. Ahmad, I. UdDin, A. Ilyas (Abdullah, et al. 2019) the scholars emphasized a social component of the factors that affected food security of the country. Under is the appraisal of logistics potentiality of the principal nations of agricultural production of the globe that is based on the ameliorated methodological method of a set of competitive elements, pursuant to the procedure that is shown in paragraph (Table 3.2). The obtained results were only used for research purposes.

Pursuant to the logistics potentiality appraisal of the main countries of the world's agricultural production, logistics potential of the leader nation (US) has been set up to be 0.83 c. u., which indicates the logistic management's highest level in the country, it can be seen from the data of Table 3.3 that considering current world trends. When the logistics potentiality of the more external nation (Nigeria) is 0.0 c. u., which shows the logistic management's bluest degree in this nation, pursuant to Table 3.2.

We will form a critical basis for the logistic management in the specified countries (Table 3.2) , which contains a description of the levels of logistics potential that enables to make effective managerial decisions at the interstate and state level in the sphere of agrarian products' commodity flow logistics.

Table 3.2 - Assessment of logistics potential of the main countries of agricultural production of the world in 2018 (rank; weight)

Names of economic indicators	USA	Germany	Canada	China	India	Brazil	Ukraine	Nigeria
Product safety block								
Quality of land administration	5;0,05	2;0,05	3;0,05	4;0,05	8; 0,1	7;0,1	6;0,05	9;0,1
Property rights	2;0,05	3;0,04	1;0,1	5;0,04	4;0,05	6;0,05	9;0,1	7;0,1
Prevalence of non-tariff barriers	1;0,04	2;0,05	4;0,05	5;0,05	6;0,1	9;0,02	7;0,05	3;0,05
Market capitalization	1;0,1	5;0,06	2;0,1	4;0,1	3;0,02	6;0,1	8;0,05	9;0,02
Trademark applications	2;0,06	1;0,1	3;0,05	4;0,1	8;0,1	5;0,1	6;0,1	9;0,02
Internationalization of production and logistics block								
International co-inventions	3;0,05	1;0,1	2;0,1	4;0,05	7;0,05	8;0,05	6;0,1	9;0,05
Ease of hiring foreign labour	1;0,1	2;0,05	7;0,06	3;0,05	5;0,05	9;0,02	6;0,05	4;0,05
Efficiency of air transport services	1;0,05	2;0,05	3;0,04	6;0,05	5;0,05	7;0,1	8;0,05	9;0,1
Efficiency of train service	1;0,05	2;0,05	6;0,06	4;0,05	5;0,1	8;0,02	7;0,05	9;0,1
Road connectivity index	1;0,05	2;0,1	3;0,05	4;0,06	9;0,1	8;0,1	6;0,02	7;0,02
Business process management block								
Efficiency of the clearance process	2;0,04	1;0,1	3;0,1	4;0,05	5;0,05	8;0,1	6;0,08	9;0,02
Market dominance volume	1;0,06	2;0,05	5;0,04	4;0,05	3;0,08	6;0,1	9;0,1	8;0,2
Payment and productivity	1;0,1	2;0,05	3;0,05	5; 0,1	4;0,05	9;0,02	7;0,1	8;0,02
Growth of innovative companies	1;0,1	2;0,1	3;0,05	5; 0,1	4;0,1	6;0,02	9;0,05	7;0,05
Multi-stakeholder collaboration	1;0,1	2;0,05	3;0,1	5;0,1	4;0,1	8;0,1	7;0,05	9;0,1
Rangi, y.o.	1,45	1,92	3,15	3,82	6,2	7,02	7,2	7,89
RangA, y.o.	7,89							
RangL, y.o.	1,45							
Dv, y.o.	6,44							
Attitude towards entrepreneurial risk (ERc), c. u., (ERp=7 c. u.) (Schwab, 2018)	5,8	5,1	4,4	4,5	4,7	4,1	4,7	4,8
Level of perception of entrepreneurial risk (RKSi), c. u.	0,83	0,73	0,63	0,64	0,67	0,59	0,67	0,69
Logistics potential (LPi), c. u.	0,83	0,68	0,47	0,40	0,17	0,08	0,07	0,0

Source: author's work.

We set the scope of the logistics' values likely, which differentiates each degree applying the St urges approach:

$$k_{LP_i} = \frac{0,83-0,00}{1+3,322 \cdot \lg 9} = 0,1 \quad (3.7)$$

The establishment of a decisive basis for evaluating the logistical management of productions of agriculture country on earth permits placing logistics' level in the world's countries to divide the nations into unlike clusters regarding the effectiveness of their logistics activities, which may affect investment's level and innovation attraction of the country for potential and real investors, the nations of agro-industrial products' procession, multinational transport companies and other participants of commerce processes in the agrarian production. Table 3.3 presents a critical basis for assessing the logistics potential of countries across the world.

The issues of logistics management's assessment should be studied at the macroeconomic level. Thus, this analysis is relevant in globalization challenges' frame, the instability of the world economic system, and the influence of state leaders on the world economy. Developing countries' role is also worth noting, including products of agriculture are the key to successful entrance to new markets, as transport's efficient logistics flows, for instance, the economy of Asian nations (China, Vietnam, Malaysia, and Singapore) and the western vector of goods export from these nations. The Chinese New Silk Road concept ought to be noticed, where various transport corridors for the delivery of Chinese products to European nations are reckoned, thus entailing the logistics infrastructure of Kazakhstan, Russia, Belarus, and Ukraine. The impact of the trader's logistics of Chinese products was studied by M. Marsden to the countries of Europe, Central Asia, and Afghanistan, and the correlation of the New Silk Road program in the Chinese economy with this program's export opportunities.（Marsden, M. 2017.）

It is worth noting the need to formulate the main approaches to increase internationalization's level and efficiency of agrarian industries' business processes in

the world, which play an important role in the formation of a high level of countries' logistics potential. These approaches are as follows:

Table 3.3 - Criteria of logistics potential of countries across the world

LPi,c. u.	Characteristic of the range of critical values
0,4≤LPi<0,5	The range of logistics potential's critical values shows a high level of the logistic management of the country of agricultural production, which characterizes a high level of product safety, internationalization of logistics and production, business process management, investment and innovative attractiveness of logistics of the country for various stakeholders (governments of productions of agriculture countries, traders, investors, partners, innovation canters).
0,3≤LPi<0,4	The scope of logistics potential's critical values indicates a adequate level of the logistical management of the nation of agricultural manufacture, which characterizes a adequate level of goods safety, internationalization of logistics and production, business process management, investment and innovative attractiveness of the country's logistics for various stakeholders (producers' of agriculture governments, traders, investors, partners, innovation canters).
0,2≤LPi<0,3	The range of logistics potential's critical values indicates a satisfactory level of the logistic management of the country of agricultural production, which characterizes a satisfactory level of product safety, internationalization of logistics and production, business process management, investment and innovative attractiveness of logistics of the country for various stakeholders (producers' of agriculture governments, traders, investors, partners, innovation canters).
0,1≤LPi<0,2	The range of logistics potential's critical values indicates a low level of the logistic management of the country of agricultural production, which characterizes a low level of product safety, internationalization of logistics and production, business process management, investment and innovative attractiveness of logistics of the country for various stakeholders (producers' of agriculture governments, traders, investors, partners, innovation canters).
0≤LPi<0,1	The range of logistics potential's critical values indicates the lowest level of the logistic management of the country of agricultural production, which characterizes an extremely low level of product safety, internationalization of logistics and production, business process management, investment and innovative attractiveness of logistics of the outsider country for various stakeholders (governments of producer countries products of agriculture, traders, investors, partners, innovation canters).

Source author’s work.

-changing the geopolitical vector of the countries' development from the West to the East, as a result of increasing internationalization's level and of business process management in production of agriculture in these countries due to labour resources and cheap raw materials and strengthening the Asian economies (China, Vietnam, South Korea, and Malaysia);

- re-versification of investments in the Asian nations (China, Vietnam, South Korea, and Malaysia), where the principal aim is to raise the competitiveness of the nations in the globe market;

- in the near future, internationalization and introduction of business process management standards (BPM) for agribusiness in the African countries (Morocco, Algeria, and Egypt) and Latin America (Argentina, Brazil) as a potential market for product marketing of agriculture and logistics in the leader countries;

- free economic zones' establishment (FEZs) in countries (simplified and concessional taxation) with a favorable geopolitical position, in order to increase the level of agrarian products' logistics, for instance, in Ukraine -- for goods transportation from the Asian countries to the countries European Union; in Turkey -- for transportation of Azerbaijan's energy resources, in Turkmenistan -- for the European Union countries' agriculture.

Studying methodological approaches to the assessment of logistics potential of the main countries of the world's agricultural production, it is worth noting the need for a clear ranking of logistics potential levels. This enables the investor countries' authorities to identify the outsiders or leaders in logistics' of agriculture development and to simulate the optimal logistics flow of agricultural production, which aims to optimize all transport costs for products' of agriculture delivery to the markets. One should also take into consideration. An example is the political and energy crisis in Venezuela and the redistribution of influence's zones on commodity markets of the country, including the United States markets and local authorities in Venezuela producing a negative effect on the country's logistics of agriculture. L. Pietrosemoli, K. Rodrigues-Monroy conducted the energy crisis' studies in its impact and Venezuela on commodity market of the country.

3.3 Construction and optimization of logistics management system in agricultural enterprises

Logistics ensures the normal operation of the reproduction process. The whole production process is actually a series of logistics activities. At the same time, by reducing the cost, optimize the inventory structure, reduce the capital occupation, and shorten the production cycle, to ensure the efficient development of modern production. Logistics ensures the cycle process of production to consumption and meets the needs of the society. Improve efficiency, increase sales and have the operation logic of procurement, production and sales respectively. The integrated role of logistics will transcend all these logic and pursue the overall best state of the "flow of things", including everything from procurement to sales.

Enterprise logistics is an important part of social logistics' whole system. Logistics construction must therefore proceed from the whole and the overall situation. It is necessary to fully consider and make full use of the existing logistics resources in the society, such as logistics distribution centers, logistics storage centers, tools and transportation routes, etc., in order to avoid construction's duplication and waste of resources as much as possible, and to determine the best scheme according to overall coordination's needs.

Agricultural product logistics enterprises are the bridge connecting the production and consumption of agricultural products, promoting the development of economy and the upgrading of industrial structure of agricultural agriculture, that is, the optimization and innovation of product circulation system of agriculture by the central government and local governments, attracting a large amount of labor and capital to enter the field, agricultural product circulation and product circulation system of agricultural agriculture, Involving farmers, economy of agriculture, professional cooperatives of agriculture, agriculture as a whole, agricultural product processing enterprises, logistics institutions of agriculture, sales terminals of agriculture, consumption of agriculture, etc. The relevant components of the agricultural circulation system, such as supervising circulation carriers, circulation

industry associations, and relevant government departments, will have distinct positions, calculation systems, and agricultural circulation systems in the agricultural field if these agricultural product circulation services are added. Through the channels of interests, information, funds, logistics, and so on, these topics weave together and merge. The relationship between these parts of this complicated operation system is based on voluntary principles. This relationship must be short-term, transitional, and unstable if we are outside the government consciousness and other external conditions, and if we exclude the relevant subject behaviors. Therefore, we must adhere to the voluntary principles of all parties in order to optimize the domestic agricultural product circulation system. Farmers, agricultural cooperatives, agricultural wholesale markets, sales terminals, etc. are only a few of the participants in the agricultural product logistics chain. The key connection between the participants and the various circulation subjects is their shared interests. The goal of each participant in the agricultural product circulation system in a market economy is to maximize their interests, which can be properly integrated due to the relationship between interests and the reasonable interests among various subjects. This is a crucial component for the steady, healthy, and efficient growth of the agricultural product circulation system. The main body and participants can only be developed and strengthened to reach a balanced state, and the agricultural product distribution system will be effective and stable, when the input and output of the circulation participants in the agricultural product circulation system reach a balance and only when the interests of the exchange are distributed. However, achieving a generally full equilibrium, which is the ideal state, is impractical for disciplines related to logistics in the circulation of agricultural products. The oscillation around the equilibrium is a typical state. Balance and imbalance alternate. Since a result, in order to maximize the current balance, the agricultural product logistics system should be modified to account for changes in interest and logistical patterns, as this would ensure that the interests of all relevant logistics-related subjects are generally balanced. To improve the internal demand of the agricultural product logistics system, which is the central problem of the entire agricultural production and

operation, a straightforward benefit distribution mechanism R is designed. When it comes to how large-scale industrial enterprises are used, logistics plays a major role. Due to the seasonal nature of agricultural production and agriculture, agricultural product logistics does not blindly copy the large-scale industrial model when constructing the modern logistics management framework of China's agricultural enterprises. However, experience and theory have developed gradually. In order to effectively meet the demand for agricultural production, it must collaborate with China's agriculture, rural areas, agricultural products, and other special circumstances, businesses, and local design organizations to strive for low-cost, high-efficiency, and high-quality logistics services.

While agricultural businesses compete in the market, they should focus on the value-added processing of agricultural products by utilizing low-cost, high-quality primary agricultural products and promptly providing high-quality agricultural production tools. The concept of logistics for agricultural businesses ought to be developed in accordance with the tenet of reducing costs associated with logistics management without compromising the core competitiveness or the logistics business of professional third-party logistics businesses. When developing a framework for logistics management, agricultural businesses should also take this issue into consideration.

Due to China's logistics development starting late and low level, it is a good way to accelerate the logistics management of China's agricultural enterprises to learn from the advanced experience of developed countries and excellent enterprises, and digest and absorb the successful practice of being proved by practice for our use. North America, Japan and other countries are not only mature in the research of logistics theory, but also form a scale in practice. They have many good practices and successful experience, which is worthy worth learning and reference. While learning and referring to the advanced experience, we must explore and innovate based on the reality, and create a logistics management framework of modern agricultural enterprises with Chinese characteristics.

While optimizing the existing circulation system of agricultural products, we should make full use of existing resource advantages, modern information technology and advanced management means to improve existing resources, integrate and optimize agricultural circulation nodes, shorten circulation distance, and make full use of idle circulation costs and idle circulation resources. Idle resources include transportation infrastructure, transportation vehicles, storage centers, etc., so that they can coordinate with logistics participants and form a win-win situation. In addition, it is also necessary to thoroughly study the reality to improve the investment of appropriate funds, expand the circulation facilities of modern agricultural products, and establish a reasonable and perfect logistics system of modern agricultural products.

Our country has established a relatively perfect market economy system, the market becomes the main way of resource allocation, therefore, in the process of agricultural products circulation system optimization in China, to establish the leading role of market economy, market means such as price and income, adjust the relationship between the related agricultural products circulation system between the main body, improve the efficiency of agricultural products circulation in our country. At the same time, China's rapid development is inseparable from the correct regulation of our government. Therefore, under the condition of leading market regulation, it is necessary to maximize the guiding role of the government and build a good external environment and policy support for China's modern agricultural products circulation system. Because In the process of optimization, we should properly coordinate the relationship between the market and the government to adjust the economy.

Steady development of agricultural production was maintained. The efficient operation of the agricultural products logistics system is of great significance to the agricultural development, but if the agricultural production first appears problems in China, then the circulation of agricultural products as the bridge connecting the agricultural products production and consumption is out of the question. In recent years, by the "stock market" and "property market" investment heat drops, some

originally swim in the capital market funds began to evacuate, into the field of agricultural circulation, for some agricultural products, especially fresh agricultural products hype, causing part of agricultural products price fluctuations, agricultural price fluctuations for agricultural producers and agricultural consumers are unfavorable. China's agricultural production mode is still one Body farmers is given priority to, farmers have poor capital strength, information access ability is not strong, often according to the previous price to judge the future agricultural prices, the artificial hype, confused the market real supply and demand, farmers follow a large number of planting, due in the second year to the rapid increase in supply, hype funds withdrawal, prices plunged, farmers' losses:, many farmers therefore give up agricultural production. In recent years, the income of rural residents in China has increased to a degree, but it still lags behind the growth rate of urban residents' income. The income gap between urban and rural residents has not narrowed, but has expanded. A large reason is that farmers are in the circulation process of agricultural products Right is not enough, often in weak position, income growth rate cannot catch up with the rise of agricultural prices, agricultural prices rise most interests by buyers and processing enterprises, agricultural production is the premise and basis of agricultural circulation, so in the optimization of agricultural products logistics system, should be to stabilize agricultural prices and increase farmers' income as the basic goal.

In recent years, the quality of agricultural products has improved greatly, but compared with developed countries, there is still a certain gap, agricultural products as agricultural products circulation object, circulation efficiency has an important role, with per capital income improvement, people's living standards, agricultural products and food consumption structure is gradually upgrading, for high quality, nutrition, good taste of agricultural products demand rapidly, although our agricultural products is large, variety, but the number of high quality agricultural products is less, varieties are not rich, not too much with high visibility agricultural products, production and consumption can not be very good The fit affects the circulation efficiency of agricultural products. In addition, agricultural products

safety and food safety is also a big problem in front of us, some agricultural products safety or food safety problems in the production field, such as excessive use of fertilizers and pesticides, abuse of pesticides, some agricultural products safety problems in agricultural products circulation, especially fresh agricultural circulation, with the characteristics of intolerance storage, and fresh agricultural products production and consumption is often far, very easy to deterioration and loss, in order to extend preservation, some circulation subject with chemical and other illegal means of agricultural products, It has caused serious damage to the body of consumers, so in the process of optimizing China's agricultural products circulation system, we must improve the quality of agricultural products and ensure food safety as the primary goal.

Agricultural products circulation system is a large system, the system consists of small subsystem, different subsystem consists of different circulation participants, so different main body of cooperation is the key to the efficient circulation system, in order to improve the efficiency of agricultural products circulation system, should use interests, information, legal means to effectively connect, establish a modern agricultural circulation system, reduce the circulation cost. In short, improving the operation efficiency of the existing agricultural products circulation system in China is the ultimate goal of optimizing the agricultural products circulation system.

In the process of optimizing the circulation system of agricultural products, we should also consider the ecological and environmental problems and realize the green circulation of agricultural products. The so-called green circulation refers to organize the circulation of agricultural products from the perspective of environmental protection and reduce the pollution and damage to the environment in the circulation process.

Agricultural products sales network optimization is an important topic to realize the agricultural enterprise modern logistics management, the goal of the optimization is to achieve the best logistics services, the fastest transportation and distribution services, the lowest logistics costs, the least investment, the most

efficient use of social logistics resources and make the activities related to the logistics system at the minimum.

The main methods and steps of the agricultural product sales network optimization can be divided into the qualitative analysis of the agricultural product distribution network planning, the basic structure design, the optimization of the logistics network and the determination of the logistics mode.

Establishment of agricultural products sales and logistics network system. Agricultural product sales logistics network system can also be called agricultural product distribution network system in this logistics network, agricultural enterprises pay attention to product distribution, that is, at the lowest cost, the shortest time to ensure that agricultural products are effectively delivered to customers.

Comprehensive logistics network system of agricultural products. Modern agricultural logistics should not only pay attention to sales logistics, but also consider material management and product distribution, in order to improve economic benefits.

Agricultural products logistics and supply chain network system. In the agricultural enterprises with relatively high production technology, the cost reverse control, processing and resource optimization of the production of agricultural products can be implemented, so as to improve the economic benefits of the enterprises.

Strengthen the development of agricultural products logistics technology and equipment. We will strengthen the development and production of agricultural transport vehicles, develop and improve all kinds of agricultural transport vehicles, strengthen the construction of various agricultural warehouses and develop agricultural products processing and distribution centers, as well as wholesale markets for agricultural products in origin and sales. We will strengthen the production and construction of refrigerated freight vehicles, eliminate open truck trucks that do not meet highway and food hygiene standards, and ensure the quality of refrigerated goods.

Promote the standardization and standardization of agricultural products. Establish a quality inspection and evaluation system centered on processing and food quality, and establish an agricultural production system for large-scale production. Large-scale production is not only the need to improve labor productivity, but also the basis to ensure the large-scale and standardized production of agricultural products.

At present, the development of agricultural logistics is in the initial stage, there are few large-scale agricultural logistics enterprises, and the developing agricultural logistics enterprises are also their own planning, their own operation, resulting in the repeated construction of the warehouse, cargo station, fleet and other logistics facilities, and a low degree of scale. To break this pattern, develop agricultural logistics parks, and accelerate the specialization and socialization of agricultural logistics has become an inevitable choice.

Logistics park is a centralized place of logistics enterprises or distribution centers, so it needs to be located scientifically from the perspective of market economy, because whether to attract enough funds and enterprises is the key to the success of the construction and operation of the logistics park.

The scale determination of the agricultural logistics park is a very important content in the planning and construction of the logistics park. At present, there is no relatively mature method of the logistics park scale determination in the world. At present, the determination of flow park size in China mainly take two steps: first, according to the flow factors including GDP, total import and export, etc., combined with the appropriate mathematical model, predict the total logistics, then, according to the relationship between the land scale and material flow, and the development level of the third party logistics, logistics park scale, second, each specific planning of logistics park size adopted in the total scale basis In the way of apportionment, the apportionment proportion is mainly determined according to the proportion of material flow in all directions, and according to the construction scale of foreign logistics park experience, a certain discount proportion is adopted.

Construction of the logistics information platform for modern agricultural enterprises. The structure of logistics information system refers to the composing elements of logistics information system, the connection among elements, and the function of elements and connection mode to the construction of logistics information system. The overall structure design of regional logistics information system is a subjective and overall design and planning, which is based on the requirements of system analysis and the actual situation of logistics organization to design the overall structure form of the new system and the effective allocation and integration of available social logistics resources. The main contents include overall layout, structure design, network structure design, application structure design, database structure design and computer processing process structure design.

To strengthen government guidance and coordination. At present, the key problem to obstruct the development of agricultural logistics industry is the segmentation, and the lack of cooperation and union between enterprises and departments. This is mainly the system reason, cooperative management mechanism is not established, separate, segmentation of the old management system for agricultural logistics circulation set many artificial obstacles, modern agricultural logistics is to eliminate these obstacles, each link of the logistics chain, form an organic system, so as to realize the flow, improve logistics efficiency. It can be said that the core problem of the development of modern and modern logistics industry is how to organize and manage it, and these are the problems that the government wants to solve. To build To establish the coordination and management mechanism of agricultural logistics industry, first of all, we should carry out unified planning and special planning for the development of modern agricultural logistics industry, and establish the task sharing mechanism of all relevant departments, so that all government departments can obtain consensus on the understanding of agricultural logistics ideas and the connotation and development of agricultural logistics industry. Then, a cross-departmental coordination mechanism should be established to strengthen the collaborative work ability between the relevant departments.

Establish a standardization system for the logistics development of agricultural enterprises. In recent years, the standardization system in various fields of logistics in China has been gradually established and improved, but the standardization, coordination and unified work of the agricultural logistics system is still very backward. Therefore, the government should fully start the standardization of agricultural logistics system, and the construction of modern agricultural logistics industry should be organized and implemented according to the requirements of standardization. First of all, we should vigorously promote the standardized construction of agricultural logistics facilities and equipment, including all kinds of transportation equipment, logistics equipment, packaging, information interface and other, etc. On this basis, the agricultural logistics terms, measurement standards, technical standards, data transmission standards, operation and service standards should be accelerated for research, Form a unified agricultural logistics industry national or industry standards as soon as possible, in line with the international market.

Establish a logistics and economic environment system for agricultural enterprises. At present, the slow development of agricultural logistics enterprises in China, the reasons, but from the perspective of the market, the lack of a legal, financial and administrative environment completely reassuring for enterprises and customers, the rights and interests of customers are not fully guaranteed, and the development of enterprises cannot be carried out in a free competition environment. Therefore, in order to quickly promote the development of regional agricultural logistics, it is necessary for the government to formulate various supporting policies and supporting policies, establish and improve the relevant legal system to standardize the market circulation order and the operation behavior of agricultural logistics enterprises, and guide the development of the agricultural logistics industry. Supporting policies for agricultural logistics can include land policy, finance, industrial regulation and utilization Capital policy, etc., to provide service support system for agricultural logistics enterprises, and to provide an equal competitive environment conducive to development.

Establish a standardization system of logistics market for agricultural enterprises. To build an orderly and open market environment and to promote the technological progress of the industry should be the key to the standardized management of the logistics market through equal competition. It is the best choice for the government to regulate the agricultural logistics market during the formation of the market. The government should formulate entry and exit rules, market code of conduct, service standards and technical standards for the logistics market.

Agricultural logistics enterprises are the decisive force to promote the development of regional modern agricultural logistics. We should speed up the support of a strong backbone enterprise, encourage them to take the connotation of the development path, enhance their core business ability; we should also expand the scale structure of logistics enterprises through vertical and horizontal integration. The government should also restructure and structure of various existing resource elements of enterprises, promote the integration and reorganization of agricultural logistics industry, take the road of comprehensive and scale, and form a reasonable flow of resource elements and the operation mechanism of survival of the fittest.

Establish a standardization system of logistics market for agricultural enterprises. In the field of logistics, it should be said that Chinese enterprises need to learn from foreign management experience will exist for a long time, especially for agricultural logistics. About the consciousness of agricultural logistics, the management of agricultural logistics, agricultural logistics technology, etc., in addition to investigation, training, communication, can also through joint venture and cooperation with foreign agricultural logistics enterprises, foreign direct investment brought by "technology spillover", the introduction of advanced logistics technology and management level. The entry of foreign directly invested enterprises not only brings advanced technology and advanced management experience, but also brings competition, breaking the balance of the original regional market, and forcing the local agriculture Logistics companies make more effective use of their own technologies and resources, and to find and use newer and more effective technologies. Therefore, the relevant government departments should formulate a

series of preferential policies to encourage foreign enterprises to enter. (Jin Saimei, 2006)

Training of logistics talents. Modern logistics industry is accompanied by the development of information technology and the innovation of modern logistics technology. Logistics is a talent-intensive industry. The operation and management of logistics enterprises requires a number of group of professionals familiar with the production, operation and sales of service objects, logistics service organization, transportation organization management related business familiar with marketing, computer network technology and logistics information development and maintenance aspects.

We will develop third-party logistics for agricultural products. The circulation system of agricultural products is a circulation ecosystem composed of multiple subsystems. In the whole circulation process, it includes total information flow, capital flow, business flow, logistics and other links. Problems in that link will affect the operation efficiency of the whole agricultural product circulation system. In China's current circulation system of agricultural products, logistics accounts for a large proportion and logistics costs are also an important part of the final sales price of agricultural products. Therefore, the reform of the logistics mode of China's agricultural products will certainly provide a huge role in promoting the optimization of China's modern circulation system of agricultural products in China. (Xiangli, 2011) (Wang Yan, 2008)

In the current circulation system of agricultural products in China, the wholesale market of agricultural products still plays an important role, is an important channel of circulation of agricultural products, and undertakes circulation functions such as distribution, storage and transportation. Although prosperous agricultural products wholesale market for agricultural products market, but most of the wholesale market for agricultural products logistics equipment and technology is very backward, and the whole process of agricultural products logistics lack of specialized, standardized operation, and other links in the circulation of cohesion, information lag,

the logistics cost is high, is now one of the main reasons for high prices of agricultural products.(Tao Shizong, 2008) (Dai Huibin, 2011)

We will promote logistics infrastructure construction. The development of modern agricultural logistics depends on the improvement and improvement of infrastructure. And infrastructure investment is large, social benefits are higher than economic benefits; the government should become the main body of investment. The development of logistics in developed countries to highly concentrate is precisely due to the transfer of investment entities from enterprises to the government: investment in transportation infrastructure; strengthen the construction of information networks; promote the construction of logistics parks

Conclusions to section 3

1. The supporting elements of constructing and optimizing agricultural product logistics system are analyzed. Secondly, through the capital operation, the mode of joint operation, stock participation, holding and reorganization is adopted to realize the merger of enterprises, give full play to the integration advantages, and improve the core competitiveness and anti-risk ability of enterprises.

2. Secondly, through the comparative analysis of the logistics management of agricultural production enterprises in the world, the positive and negative factors affecting the development of their products are found out, and the logistics potential of the world's major agricultural producing countries is evaluated.

3. Finally, the paper expounds the direction and path of China's agricultural products circulation system optimization, and points out the principles that China's agricultural products circulation system optimization should follow, improve the efficiency of China's agricultural products circulation system, the specific path of optimization is to develop agriculture, logistics circulation.

This section first analyzes the supporting elements of building an optimized agricultural products logistics system. It focuses on two major factors: one is organizational factor, the other is government policy. In terms of organizational elements, the development and expansion of grain logistics organizations should first

deepen the reform of the former state-owned grain enterprises, take the core enterprises as the center, establish grain enterprise groups, and make the enterprises bigger and stronger. Because the competition between enterprises is ultimately manifested as cost competition, and the significance of scale economy is to reduce costs and improve labor productivity through scale production. Without a certain scale, enterprises are difficult to withstand the impact of market wind and waves. Secondly, through capital operation, adopt the mode of joint management, equity participation, holding and restructuring, achieve combination of enterprise, has the strong market development ability, processing ability, the ability to store safeguards and industry linkage ability for purchase and sale of food enterprise group company, through the enterprise group company of food enterprise assets and resources integration, unified planning and coordination of the enterprise, Add the purchase, sales, food, and stock management chain link together again, giving full play to the advantages of integral, organized to carry out the grain circulation, formed on the basis of high quality food production base, which is based on farmers, to enterprises, in the grain and oil processing group operation mode, improve enterprise core competitiveness and risk resistance. Farmers are the main body of agricultural and sideline product logistics, and the reality proves that farmers' market transaction costs are high. Domestic and international practice has proved that it is difficult to realize the connection between the scattered farmers and the large market and circulation at home and abroad, and the reasonable interests of farmers are difficult to be guaranteed. Therefore, it is necessary to set up peasant cooperative economic organizations on the basis of farmers' willingness, organize scattered and small-scale peasant households, improve the exchange conditions of agricultural products, form agglomeration economy of scale and obtain economic benefits of scale. At present, the organizational form of "company and peasant household" is widely adopted in China. Practice has also proved that in the case of opportunistic behavior on both sides, the pattern of "company and farmer" is difficult to achieve a win-win outcome. To improve the level of farmers organization, this paper puts forward the following measures: 1, to develop the farmer cooperative marketing organization, organize

farmers to enter the market, to solve a production and business operation activities of the information asymmetry, to enter the market, the risk is big, product distribution links, the cost is high, resulting in increasing the income of farmers increase no problem;2. There are mainly two modes to cultivate and develop agricultural products logistics intermediary organizations representing farmers' interests :(1) company + agricultural cooperative + peasant household model; (2) "company + association + peasant household" organizational model. The government plays a very important role in the development and expansion of the logistics industry. The main role of the government is to take policy measures to guide and promote the development of domestic logistics and strengthen the macro-guidance and regulation of logistics development. Our government should strengthen the following functions in the development of agricultural products logistics industry: first, do a good job in the unified planning of agricultural products circulation facilities to prevent repeated construction; Second, encourage multichannel social funds to invest in the construction of the circulation system of agricultural products; Third, continue to implement the policy of bank loans and fiscal interest discount; Fourth, increase the government's direct investment and support; Fifth, expand the opening of circulation facilities to the outside world; Sixth, rectify the wholesale market transport link charges; Seventh, cultivate agricultural logistics talents.

Secondly, through the comparative analysis of logistics management of agricultural producers in the world, the positive factors affecting their product development are found. They are globalization, innovation, green production. Negative factors are the effects of nature and climate, lack of effective logistics policies and sustainable development by governments in developing countries. The logistics potential of the world's major agricultural producing countries was evaluated. The leading country with high logistics potential (the United States) was 0.83 C.A standard basis was established to evaluate the logistic potential of major agricultural producing countries in the world in six grade systems with 0.1 c. U level. According to the logistics potential of major agricultural producing countries in the world, the ways to improve the international level of agricultural enterprises and the

efficiency of business process are found out. The main manifestations are: the change of production vector, the reversal of investment, BPM and the integration of producers of agriculture, and special economic zones' formation. In terms of further research, methodological and theoretical work needs to be influenced by external (macroeconomic, geopolitical, external cooperation) and internal economic factors (national development, investment, innovation, and Labour resources) in the logistics management of producing countries of agriculture.

Finally, the direction and path of China's agricultural products circulation system optimization were elaborated, pointing out that the optimization of China's agricultural products circulation system should comply with the principle of involuntariness, interest coordination and system activeness, the optimization goal is to improve the operation efficiency of China's agricultural products circulation system, increase farmers' income, ensure food safety of residents, Implementation mechanism is the price of agricultural products circulation system optimization mechanism, competition mechanism, information mechanism and management mechanism, the mechanism from both inside and outside two aspects of function, improving the efficiency of the agricultural product circulation system in our country, the specific path of optimization is to develop the agricultural professional cooperatives, vigorously develop cold chain logistics, third party logistics mode and the promotion of farmers and circulation.

CONCLUSIONS

Each subject has its specific personality and the way to construct the logical framework of the subject. Due to the interdisciplinary and comprehensive characteristics of modern agricultural logistics research, its research ideas and methods must reflect the characteristics of universal and unique integration. the theoretical concepts of modern agricultural logistics development are built based on a study of the growth of agricultural logistics both domestically and overseas. Through the research of various components of modern agricultural logistics, such as function, characteristics, categorization, management, development trend, and modern agricultural logistics industry, as well as the definition of the connotation of modern agricultural logistics, and the analysis and future prospects for agricultural logistics growth. the study examines the development state of Chinese agricultural logistics and its affecting variables, focusing on theoretical development and practical application as a guide, and employing experience in agricultural logistics development from other countries. what's more, proposes a model for creating current farming coordinated factors, building a cutting edge horticultural strategies framework with the idea of market interest, and upgrading the development of rural planned operations association as the objective. In view of this, this postulation proposes countermeasures for the improvement of current farming coordinated operations in China, and attempts to give hypothetical premise and dynamic reason for pertinent divisions.

The concept of modern agricultural logistics, function, characteristics, modern agricultural green logistics, modern agricultural logistics development trend, and modern agricultural logistics industry have all been described in detail in this thesis, which first develops from the study of basic theory to determine the connotation of modern logistics. According to research, the aim of modern agricultural logistics, which is supported by information technology, is to meet customer demand. It does this by organizing, controlling, and managing economic activity from the source to

the consumer source and uses modern logistics to deliver agricultural production and output content as well as related services and information from the source to the consumer. a wide norm, a massive amount, independence, specificity, non-equilibrium, value preservation, processing, value addition, and a high degree of risk are some characteristics of regulation, among others. In order to ensure customer satisfaction with the service level, modern agricultural logistics management involves the scientific management of agricultural logistics operations throughout the prenatal, production, and postpartum processes.A novel method for overseeing agricultural logistics is modern agricultural supply chain management. The development of modern agricultural logistics in a sustainable manner is the goal of green logistics. Modern agricultural logistics has the trend of specialization, standardization, advanced technology, branding, intensification, synergy and greening. Modern agricultural logistics industry is a compound or aggregate industry formed by the industrialization of agricultural logistics resources, which has the characteristics of multi-industry, basic, service and aggregation.

The development mode of agricultural logistics is related to the efficiency and benefit of agricultural logistics. Self-support logistics, the leading model of Agricultural intermediary organizations and the third party agricultural logistics are the main development models of agricultural logistics in China. However, the vast majority of enterprises using self-run logistics mode have low resource utilization rate, poor information flow, high logistics cost and low efficiency of agricultural logistics operation. Most of the intermediary organizations are underdeveloped and their legal status is not clear, so they cannot undertake the organization and management activities of agricultural logistics. The number of third-party agricultural logistics enterprises is small, the scale is small, the management level is low, the information system and network construction is backward, can only provide simple services, lack of value-added services, almost do not have the coordination of agricultural logistics, organization, management ability. At the same time, the current mode of logistics management is also multi-segment, decentralized; Under the current development mode of agricultural logistics, the relationship between

economic development and agricultural logistics, consumption and agricultural logistics is one way, which has caused serious damage to the ecological environment. Follow the principle of the interests, efficiency and sustainable development, contact the specific national condition, from the perspective of system theory and sustainable development, the thought of supply chain integration mode, intermediary organizations linkage mode, the third party logistics model, node model, coupling, network development and electronic virtual supply chain model is a main mode of our country's modern agricultural logistics development in the future.

In order to make this research to practical, universal and forward-looking, and probes into the world economy developed areas of North America, Western Europe, east Asia representative of the present situation of the agricultural products logistics, expansion and modernization of China in the circulation of agricultural products, logistics organization and management way, logistics facilities and technical level, and the contrastive analysis of logistics system, Its purpose is to summarize the advanced experience of developed countries and regions, and provide enlightenment for the establishment of China's agricultural logistics model.

In this thesis, the author puts forward that the construction of the evaluation index system of the core competitiveness of agricultural logistics enterprises should follow the principles of scientificity, systematicness, feasibility and combination of quantitative and qualitative. According to the components of agricultural products logistics enterprises core competitiveness, this chapter that evaluation should be the core competitiveness of agricultural products logistics enterprises from the service force, innovation, marketing power, management power and cultural power five aspects to research, and finally designed a set of the five primary indexes and 22 secondary indicators of evaluation index system.

A modified global competitiveness assessment methodology is used with the aim of understanding specific aspects of competitiveness. It is a decision-making tool for various stakeholders, including international investors, companies, technology policies, technology parks, innovation incubators, businesses, governments, local authorities, and other relevant stakeholders at the national and regional level. The

provided benchmarks enable identification of vehicle development and testing partners' investment in industrial development. Specific decisions can also be made based on the methodology provided, and in addition, initial investments in different areas can be assessed according to the level of national innovation potential. After the improvement in the field of strategy from the following: strengthening the interaction and diversity "aspect, the improvement of research and development, and strengthen the commercialization, speed up the entrepreneurial energy, expand the scale of innovative enterprises and risk bearing ability, manifests the enterprise vitality of small and medium-sized enterprises and the types of financial support and system support the national financial activities of the public and private partnership. Moreover, economic growth and innovation should be implemented within the context of the Sustainable Development Goals.

The methodology for evaluating innovation quality of countries has been amended by introducing additional indicators of risk-taking (RTC) and enterprise use of Disruptive thoughts (DCI) and regrouping the GCI sub-indices that was relevant to innovation.

This allows the design of the seven-parameter evaluation system to gain insight into the factors underlying the further development of innovation potential in certain countries. Leaders and outsiders are identified, and the standard basis for the innovation potential of these countries allows them to be grouped at several levels. Innovation potential (IP) evaluation is highly correlated with GCI. On the other hand, it provides new insights for further strategic design to achieve a balance between vectors of innovation potential. The catch-up strategy for industrial upgrading is a topic that has received much attention, and the authors identify the gaps in development and differences between countries of the major manufacturers of machine manufacturing products, and through stepwise comparison of sub-indices and best practice analysis, propose strategies and suggestions for improving potential.

The supporting factors of constructing an optimized agricultural product logistics system are analyzed. It mainly analyzes two elements: one is organizational factor, the other is government policy. In the aspect of organizational elements, the

development and expansion of grain logistics organization, first of all, we should deepen the reform of the former state-owned grain enterprises, take the core enterprises as the center, establish grain enterprise groups, and make the enterprises bigger and stronger. Because the competition between enterprises ultimately manifests as cost competition, and the significance of scale economy lies in reducing cost and improving labor productivity through scale production. Without a certain scale, it is difficult for enterprises to withstand the impact of market storms. Secondly, through capital operation, adopt the mode of joint management, equity participation, holding and restructuring, achieve combination of enterprise, has the strong market development ability, processing ability, the ability to store safeguards and industry linkage ability for purchase and sale of food enterprise group company, through the enterprise group company of food enterprise assets and resources integration, unified planning and coordination of the enterprise, Add the purchase, sales, food, and stock management chain link together again, giving full play to the advantages of integral, organized to carry out the grain circulation, formed on the basis of high quality food production base, which is based on farmers, to enterprises, in the grain and oil processing group operation mode, improve enterprise core competitiveness and risk resistance. The main body of the logistics of agricultural and sideline products is the farmers. The reality proves that the market transaction cost of farmers is high. The practice at home and abroad has proved that it is difficult to connect with the large market and circulation at home and abroad by simply relying on scattered farmers, and it is difficult to guarantee the reasonable interests of farmers. Therefore, it is necessary to set up farmers' cooperative economic organizations on the basis of farmers' willingness, organize scattered and small-scale farmers, improve the exchange conditions of agricultural products, form economies of scale and obtain economies of scale. At present, the organization form of "company + household" is widely adopted in our country. Practice has also proved that it is difficult to achieve a win-win outcome in the case of opportunistic behavior on both sides. To improve the level of farmers organization, this paper puts forward the following measures: 1, to develop the farmer cooperative marketing organization,

organize farmers to enter the market, to solve a production and business operation activities of the information asymmetry, to enter the market, the risk is big, product distribution links, the cost is high, resulting in increasing the income of farmers increase no problem; 2. Cultivate and develop agricultural product logistics intermediary organizations representing farmers' interests. In the development of logistics industry of agricultural products, our government should strengthen the following functions: First, make unified planning of circulation facilities of agricultural products, prevent repeated construction; Second, encourage multi-channel social funds to invest in the construction of agricultural products circulation system; Third, continue to implement the policy of bank loans and financial discount interest; Fourth, increase the government's direct investment and support; Fifth, expand the opening of circulation facilities; Sixth, rectify the wholesale market transport link charges; Seventh, cultivate agricultural products logistics personnel.

At the same time, it is suggested that the logistics management evaluation should be studied at the macroeconomic level. This analysis is consequently connected to the framework of national leaders' impact on the world economy, the instability of the globe economic system, and the challenges of globalization. Developing countries' function is notable. Products' of agriculture exclusively expeditious logistics is the key to successful entry into raw markets. and countries around the world need to develop major ways to improve the level of internationalization of agricultural industries and the efficiency of business processes, which plays an important role in shaping a high level of logistics potential in countries. Studying the methodology of logistics potential evaluation of major agricultural producing countries in the world, it is worth noting that the logistics potential level needs to be clearly ranked. This enables investing country authorities to identify leaders or outsiders in agricultural logistics development and model optimal logistics flows for agricultural production to optimize all transportation costs for delivery of agricultural products to market. The influence of external economic factors should also be considered. Through the comparative analysis of the logistics management of agricultural producers in various countries, the positive factors

affecting their product development are found out. They are globalization, innovation, green production. The negative factors are the effects of nature and climate, the lack of effective logistics policies and the sustainable development of developing country governments. The logistics potential of the world's major agricultural producing countries has been assessed; The leading country with high logistics potential (the United States) is 0.83C. A standard basis for evaluating the logistics potential of the world's major agricultural producing countries in a six-level system with a level of 0.1 C. U was established. According to the logistics potential level of major agricultural producing countries in the world, the ways to improve the internationalization level and business process efficiency of agricultural enterprises in the world are found out. The main manifestations are: the change of production vector, investment reversal, integration and BPM of agricultural producers, and the formation of special economic zones. For further research, theoretical and methodological work needs to be influenced by both external (macroeconomic, geopolitical, external cooperation) and internal economic factors (national development, investment, innovation, labor resources) in the logistics management of agricultural producing countries.

Finally, this paper describes the direction and way of optimizing the circulation system of agricultural products in China, and points out that the circulation system of agricultural products in China should abide by the principle of voluntary, interest coordination, and system coordination. The goal of optimization is to improve the operation efficiency of the circulation system of agricultural products in China, increase the income of farmers, and guarantee the residents' food safety. Implementation mechanism is the price of agricultural products circulation system optimization mechanism, competition mechanism, information mechanism and management mechanism, the mechanism from both inside and outside two aspects of function, improving the efficiency of the agricultural product circulation system in our country, the specific path of optimization is to develop the agricultural professional cooperatives, vigorously develop cold chain logistics, third party logistics mode and the promotion of farmers and circulation.

Modern agricultural enterprise logistics is a very worthy of research, this paper based on domestic and foreign related research on the agricultural enterprise logistics for a preliminary discussion. Due to the limited time and knowledge, there are still many aspects can not be in-depth discussion, such as agricultural enterprise logistics system and other logistics systems, agricultural enterprise logistics system optimization design, agricultural enterprise logistics system evaluation and so on, these problems will continue to study.

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