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The Integrated Logistic Systems in Agro-Industrial Complex of the Krasnoyarskiy Territory: Base and Prospects of Development

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Effective logistics system is a significant competitive advantage in the market. It is confirmed by the major tendencies of the world logistics market development. The paper is devoted to the methods of strategic alliances formation with the purpose of more effective logistic tasks solutions and costs saving at the agro-industrial complex enterprises of the region, as well as introduction of the integrated supply chain control systems on the basis of increasing 3PL and 4PL providers share in supply chains.

Keywords: logistics system, agricultural products, supply chain, integration, distribution center.

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Research area: economics.

Introduction

The research is aimed at solving systemic problems of agro-industrial complex development of the Krasnoyarsk Territory that are as follows:

- low average labor productivity in agriculture;
- insufficient development of integrative relations in the agro-industrial complex of the Krasnoyarsk Territory;
- lack of practical testing of the complex of issues, covering regulation of supply chains in

agro-industrial complex and including the state's relations with the agricultural market subjects;

- significant competitive barriers for the Krasnoyarsk agricultural producers, connected with the issues of marketing information formation, ineffective pricing and unprofessional approach to the cost management at enterprises, organizations, and, specifically, in case of joint ventures, in the food supply chain in the Krasnoyarsk Territory;

- insufficient coordination of the supporting institutions of financial investment;

- irregularity and non-systematic activities in the existing transport and logistics infrastructure.

Systemic problems solution is carried out by decomposing common problems and developing ways of successive elimination of the problems' causes in each subsystem of the transport and logistics network.

The basis for justifying the relevance of the research are the results of the functional analysis of the existing development programmes of 4 peripheral areas of the Krasnoyarsk urban agglomeration: Sukhobuzimsky, Emelyanovsky, Berezovsky and Mana districts in terms of systematic approach to the logistics infrastructure development, carried out by Logistics Department of Krasnoyarsk State Agrarian University. The analysis revealed drawbacks in the commodity distribution and logistics infrastructure development in the following scope: 39.62% of factors account for deficiencies in transport infrastructure; 22.64% - in the warehouse and utility infrastructure; 37.34% - in information and financial infrastructures. The relevance is determined by the tendencies of the supply chain development, focused on integrated connections, namely:

- formation of logistics services market: municipal, regional, national and international;

- increase in the outsourced functions: commercial, information and financial to improve the quality of services;

- growth of the customized production of goods and services on a large scale;

- increase in the share of large warehouse logistics service providers in the field of storage, cargo handling and transportation production of agricultural goods producers;

- growth in demand for the following services: information, logistics, warehousing,

international freight forwarding, reverse logistics, domestic transportation, order management, freight forwarding;

- growth of the demand from the business community to the field of education on the quality of training professionals in the field of logistics and supply chain management.

Methods

The paper presents the results of research on innovative logistics technologies of the supply chain management with the view to improve interconnections of the structures of the agricultural complex subjects of the region to ensure harmonized state of the spheres of consumption and production of food products in the region.

This will lead to the development of the rural enterprises' production bases; increase in the enterprises' competitive advantages in the supply chain and improvement in the quality of food. At that, the key conditions for the implementation of the tasks set are the following: presence of companies owning the necessary logistics capabilities in the region; participation in implementing the project of the public organizations of entrepreneurs and providing legislative bodies' activities.

The research objectives can be differentiated among direct and indirect participants of the logistics system in the following way:

1. Agricultural enterprises in the territory perform the tasks of potential resource points of territories realization in different market segments; formation of cooperative groups of individual farmers; agricultural products cultivation and primary processing according to the orders from the retail network companies.

2. Logistics distribution centers and logistics operators – monitoring potential resource points of the territories in different market segments; order placement to agricultural producers;

transportation, procurement, cargo transportation and products delivery to processors, retail outlets and consumers.

3. Network trade business – organization of agricultural products sales and services; setting up production for the agricultural products processing.

4. The authorities – legislative preferential provision of the logistics integrated system’s work; private-public funding of innovative projects in logistics and agricultural raw materials processing; providing regional and municipal property to the project participants for the long-term rent.

Currently, a lot of companies do not attach much importance to logistics. There is a lack of specialists in logistics in the Krasnoyarsk Territory. At the same time, in the market, the era of competition between companies in Russia is finishing, and the era of competition between the supply chains has started. At that, on the one hand, partnership relations in the supply chain

are developed in a way that all the participants of the chain have deep understanding of each other’s business, they trust each other, communicate a lot, think and make long-term strategic plan. On the other hand, the problem of relations in most supply chains in Russia lies in the fact that the chain participants do not have good understanding of each other’s business, they are closed from the external environment, do not trust other participants of the supply chain and have poor communication.

For the agricultural complex supply chains analysis it is beneficial to apply the complete supply chain structure shown in Fig. 1.

The complete supply chain conception allows to form a conception for the chain management (Fig. 2).

At that, the main functional areas of any agricultural enterprise logistics system in the supply chain coincide with the core functionality of the enterprise logistics: Supply management, Transport logistics, Distribution and sales,

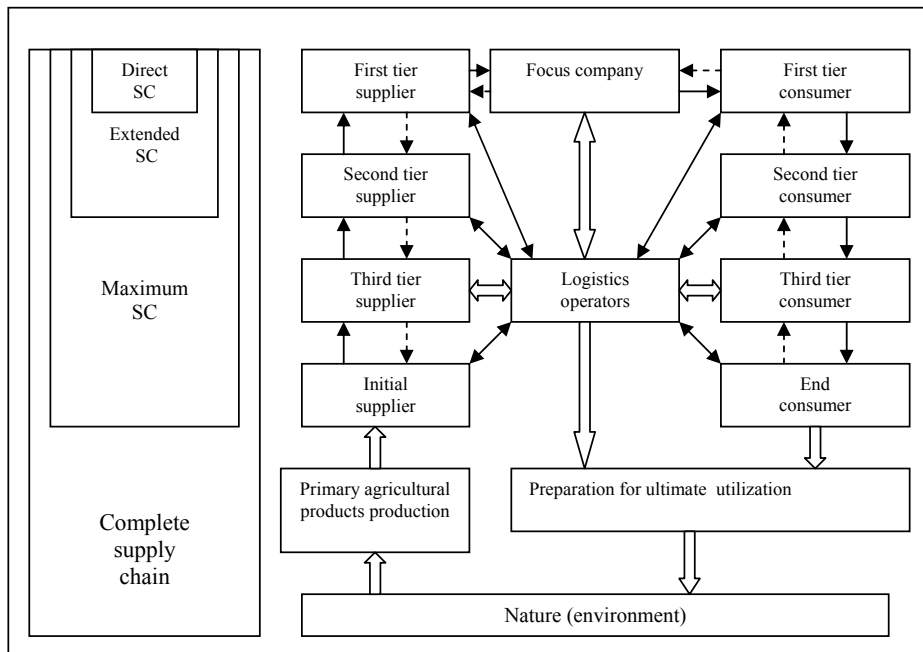


Fig. 1. The complete supply chain conception

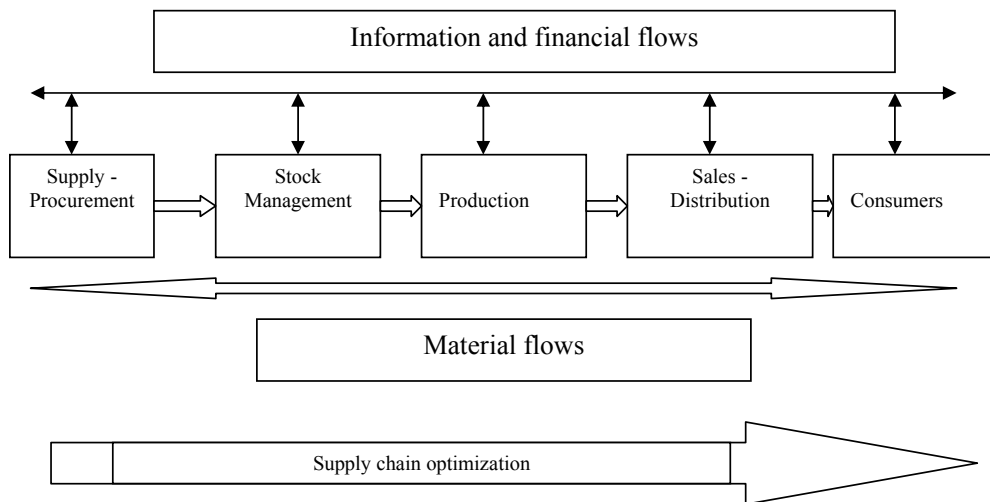


Fig. 2. The complete supply chain management conception

Production logistics, Information support, Stock management and Warehouse logistics.

The analysis of agricultural enterprises and their partners, suppliers and customers' activity has shown that there are prerequisites for modernization of their relations into the logistics supply chain network based on the supply chain management principles (SCM): "Logistics + SCM = innovation". Currently, due to the high level of information technology, there is a fusion of the spheres of logistics activities in the information field, turning logistics into the strategic innovation system [3].

SCM model can be represented as a combination of three subsystems:

1 the supply chain structure as a network of the supply chains participants and the relations between them;

2 business processes taking place in the supply chain, as types of activities providing consumers with a specific value;

3 the components of the supply chain management as managerial decisions, by which business processes are integrated and managed within the limits of all the supply chains [1].

The combination of these three subsystems accurately represents the essence of SCM

technology – supply chains management as an integrated interaction of agricultural producers, carriers and the network trade structures. This implements "Customer – Service" principle in the supply chain, when one thinks not only about themselves, but about the entire chain. In this case systematic approach means that the cross-functional relations in companies and inter-organizational ones in the supply chain must be coordinated. Interacting links should have an understanding of each other's activities. This makes it possible to coordinate interests and avoid the chain destruction in case of one of the links absence.

This approach in the integrated supply chains logistics management in the agricultural complex of the region makes it possible to implement the main principles of management – coordination in conflict management understanding in the supply chain, and integration – in understanding the use of the partners' resources. Smoothing obstacles can be implemented by forming such supporting key factors as: coordination, added value, human resource training and the supply chain monitoring. In this case, the implementers' roles of these key factors are distributed as follows:

- coordination – administration of the territory, towns and districts;
- added value – network structure, carriers, logistics centers and operators;
- training, monitoring and human resources – educational structures and public organizations of entrepreneurs.

Structure development and logistics companies' integration into the supply chains of agro-industrial complex of the region is expectedly to be implemented in the following

configuration: commodity producer – logistics consultant – 4PL logistics operator – 3PL logistics operators – information technology logistics subsystems – transportation and storage logistics distribution networks [2].

Discussion

The conducted analysis of the trade flows' sources in the agricultural complex of the Krasnoyarsk territory allows to identify a group of priority commodity producers

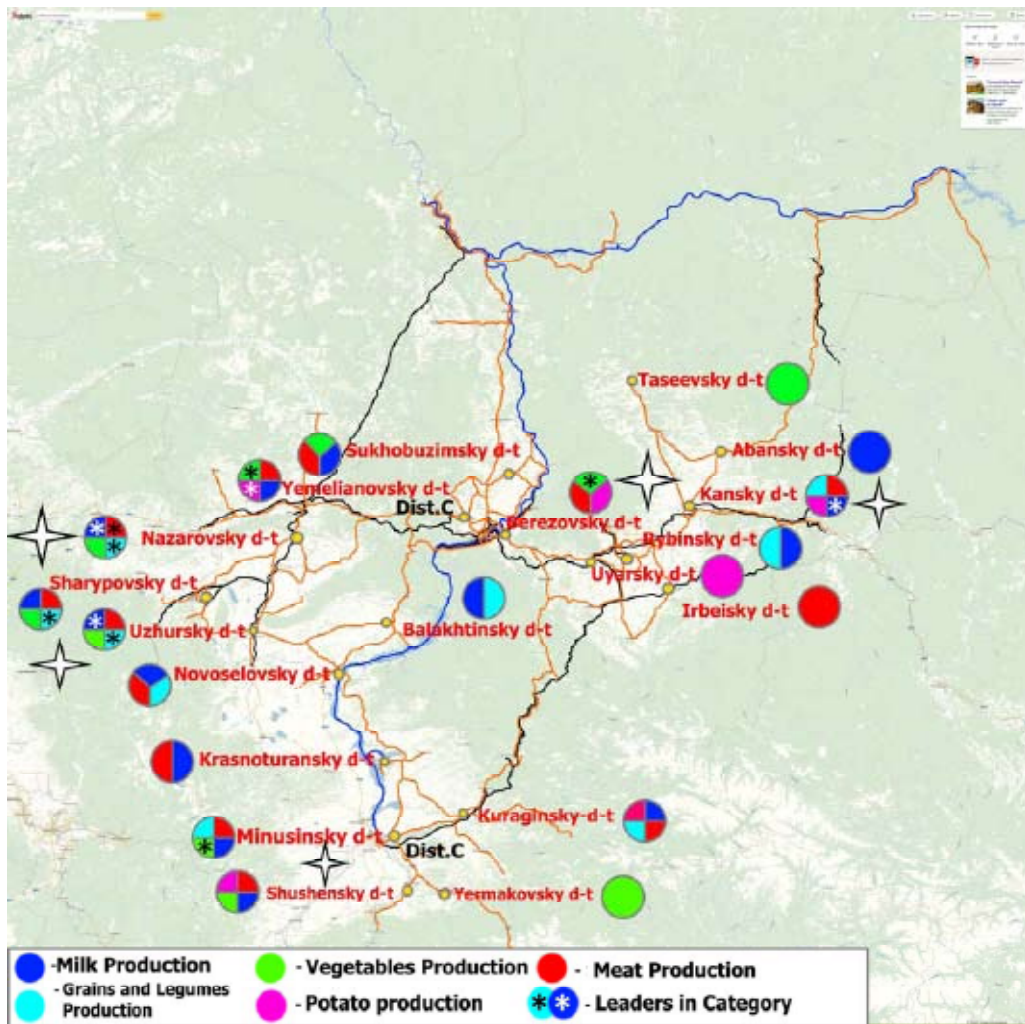


Fig. 3. Allocation scheme of the main producers of agricultural products in the south of the Krasnoyarsk Territory, consolidation transport and storage centers (marked with stars) and distribution logistics centers (marked as “Dist. C”)

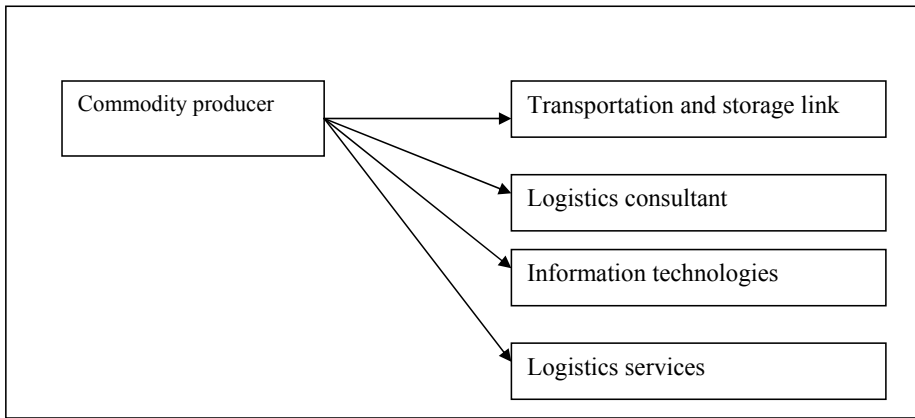


Fig. 4. Logistics companies structure development and activity integration in the coming period

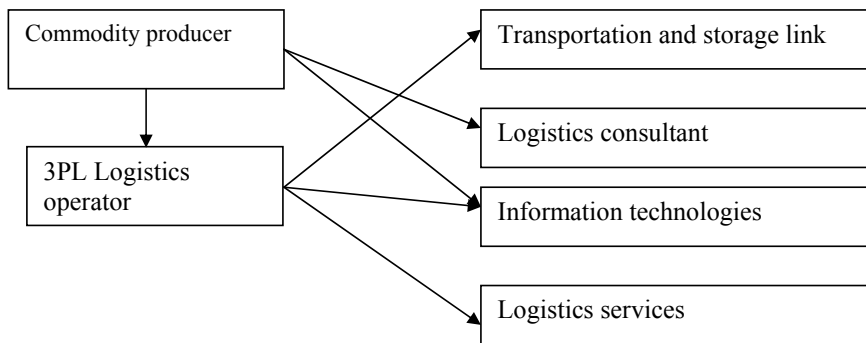


Fig.5. Logistics companies structure development and activity integration in the modern period

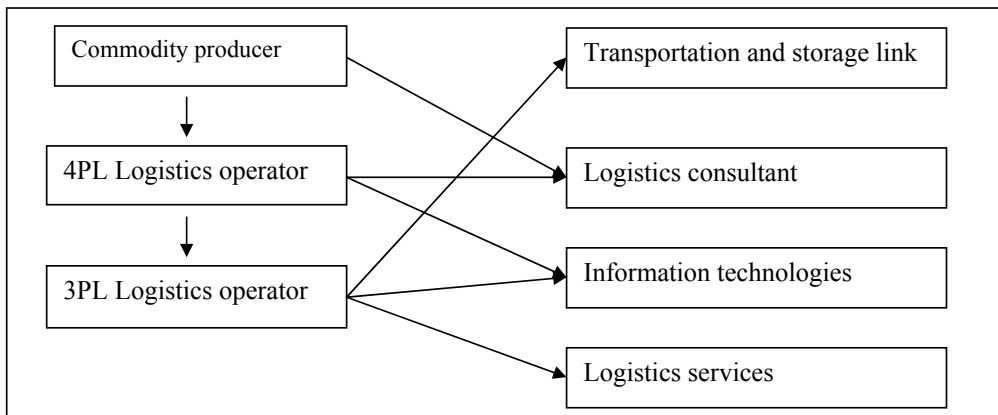


Fig. 6. Logistics companies structure development and activity integration in the long term

and put them on the map of the southern part of the Krasnoyarsk Territory. Based on the trade flows analysis, the placement of five

consolidation and assembling transportation and storage integrated logistics centers and two distribution centers in the places of the

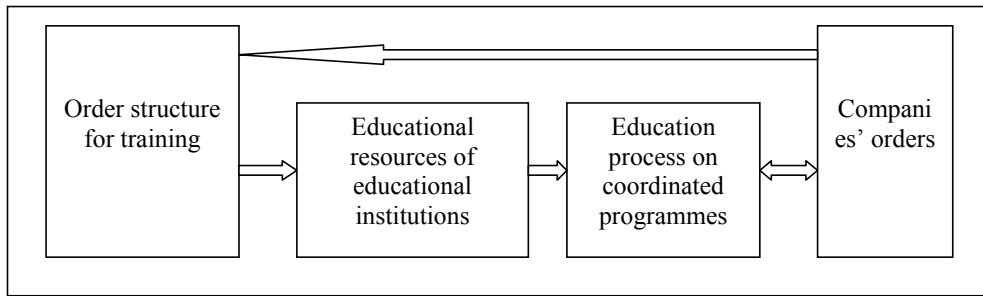


Fig. 7. The scheme of target-oriented educational programmes formation on logistics and the supply chains management

greatest consumption of agricultural products is justified (Fig. 3).

The agricultural enterprises structure development and activity integration can be represented as a consistent transformation of the nature and methods of interaction of the supply chain participants from the traditional variant with the presence of simple 3PL type intermediaries (Fig. 4, 5) to the formation of 4PL logistics operators groups (Fig. 6).

The result of such transformation will give opportunity to implement the main condition of integrative relations in agricultural complex supply chains – end-to-end planning of trade flows between agricultural producers, processors, operators, consolidation and distribution centers and retail chains.

Solutions of the tasks set and conceptions are possible with an appropriate number of staff competent in logistics. For human resource training the model of the applied educational process can be used (Fig. 7). The essence of the model is in the formation of the University interaction options

with other educational institutions and business structures. The objective of the model is to improve integration of the resources of the educational services market and the labor market participants. To solve the task two responsible action blocks are formed. The first block is the block of information and analytical support of labor markets and educational services. The second block is the block of improvement and development of educational resources in the Krasnoyarsk Territory.

Conclusion

The applied aspects of the conducted studies as recommendations can be summarized as follows:

- creation of management, information support and monitoring of the commodity distribution supply chains group;
- coordination of a network of logistics centers, manufacturers and logistics operators;
- training of the supply chain participants in the technology and the methods of the supply chains management.

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**Интегрированные логистические системы
в агропромышленном комплексе
Красноярского края:
база и перспективы развития**

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Эффективная логистическая система – значимое конкурентное преимущество на рынке. Это подтверждают основные тенденции развития мирового рынка логистики. В статье исследуются методы формирования стратегических альянсов с целью более эффективного решения логистических задач и снижения издержек на предприятиях агропромышленного комплекса региона и внедрения систем управления интегрированными цепями поставок на основе увеличения доли 3 PL, 4PL провайдеров в цепях поставок.

Ключевые слова: логистическая система, агропродукция, цепь поставок, интеграция, распределительный центр.

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