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THE PLACE AND ROLE OF ROAD TRANSPORT IN THE AGRICULTURAL LOGISTICS SYSTEM

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Annotation. *This article scientifically analyzes the role and economic significance of road transport in the agricultural logistics system. The efficiency of road transport in the processes of cultivation, storage, processing and delivery of agricultural products to the consumer is highlighted. The impact of the transport and logistics system on the development of the agricultural sector, existing problems and ways to overcome them are also considered.*

Annotatsiya. *Mazkur maqolada agrar logistika tizimida avtomobil transportining tutgan o‘rni va iqtisodiy ahamiyati ilmiy jihatdan tahlil qilingan. Qishloq xo‘jaligi mahsulotlarini yetishtirish, saqlash, qayta ishlash va iste’molchiga yetkazib berish jarayonlarida avtomobil transportining samaradorligi yoritilgan. Shuningdek, transport-logistika tizimining agrar soha rivojiga ta’siri, mavjud muammolar hamda ularni bartaraf etish yo‘llari ko‘rib chiqilgan.*

Аннотация. *В данной статье научно анализируется роль и экономическое значение автомобильного транспорта в системе сельскохозяйственной логистики. Подчеркивается эффективность автомобильного транспорта в процессах выращивания, хранения, переработки и доставки сельскохозяйственной продукции потребителю. Также рассматривается влияние транспортно-логистической системы на развитие агропромышленного сектора, существующие проблемы и пути их преодоления.*

Keywords: *agricultural logistics, road transport, agriculture, logistics system, freight transportation, transport infrastructure, export, efficiency*

Kalit so‘zlar: *agrar logistika, avtomobil transporti, qishloq xo‘jaligi, logistika tizimi, yuk tashish, transport infratuzilmasi, eksport, samaradorlik.*

Ключевые слова: *сельскохозяйственная логистика, автомобильный транспорт, сельское хозяйство, логистическая система, грузоперевозки, транспортная инфраструктура, экспорт, эффективность*

Introduction. In the current conditions of globalization and market economy, along with the production of agricultural products, the issue of their storage, processing and timely delivery to the consumer is also of great importance. Especially in the agricultural sector, the effective organization of the logistics system is one of the important factors in ensuring the country's food security, filling the domestic market with quality products, and increasing export volumes. From this point of view, the transport system, in particular, road transport, is an integral and most active link in agricultural logistics.

The growing demand for agricultural products in the world economy requires the improvement of the agricultural logistics system. In particular, the issue of fast and high-quality delivery of products from the producer to the consumer is one of the important economic factors. In this regard, the transport system, in particular, road transport, is of particular importance as a main component of agricultural logistics.

Today, most agricultural products are perishable and require their transportation in short periods of time. Road transport, on the other hand, is distinguished from other types of transport by its high mobility, flexibility and speed. Therefore, the issue of the effective use of road transport in the agricultural logistics system is of urgent scientific and practical importance.

Literature review and problem statement

The development of transport and logistics systems has been studied by many foreign and domestic scientists. In particular, extensive theoretical and practical research on optimizing the

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transportation of cargo flows in transport networks and developing transport networks in accordance with the growth of cargo flows is being carried out at leading universities and research institutes around the world, including the Russian Transport University (Russia), Siberian Federal University (Russia), University of Pennsylvania (USA), Washington State University (USA), Iowa State University (USA), Wuhan University of Technology (China), Zilina University (Slovenia), Klagenfurt University (Austria), Gdansk University of Technology (Poland), etc. In their opinion, the main part of transportation costs falls on transport services, and optimizing the transport system plays an important role in reducing the cost of products. D. Bowersox and D. Closs noted in their scientific works that the smooth operation of the logistics system is closely related to the transport infrastructure. According to scientists, road transport is the most convenient type of transport for transporting agricultural products in short periods of time.

Local economists B.A. Khojayev, Sh.A. Botayev, G.A. Samatov, K.T. Khudaiberganov, A.M. Bagdasarov, N.N. Ibragimov, A.A. Mukhitdinov, R.Z. Nurmukhamedov, A. Kuziyev and other scientists have made a significant contribution to the development of methods and algorithms for optimizing transportation and improving the effective management of the combined movement of various types of transport. The analysis shows that although there are studies on the role of road transport in the agricultural logistics system, the issues of developing logistics infrastructure in rural areas, the effective use of refrigerated vehicles, and the introduction of digital logistics technologies are still relevant.

Agricultural products differ from other types of products in their perishability, seasonality and high demands on storage conditions. Since it is difficult to store fruits and vegetables, milk, meat and other food products for a long time, they need to be delivered to the consumer in a short time. It is in this process that road transport plays an important role in the rapid transportation of products, maintaining their quality and ensuring the uninterrupted operation of the logistics chain.

Today, in developed countries of the world, great attention is paid to the modernization of the agricultural logistics system, the use of modern vehicles and the introduction of digital logistics technologies. Large-scale reforms are also being carried out in Uzbekistan to develop agricultural and logistics infrastructure. This further strengthens the relevance of the issue of scientifically studying the role of road transport in the agricultural logistics system and increasing its efficiency.

The economic essence of the agricultural logistics system

Agricultural logistics is a system for managing the movement of agricultural products, raw materials and material resources from production to delivery to the consumer. This system ensures the integral connection of material flows, information flows and financial processes.

Road transport performs the following functions in the agricultural logistics system:

- delivery of agricultural machinery and resources;
- transportation of crops from the field to warehouses;
- delivery of raw materials to processing plants;
- transportation of finished products to markets and consumers;
- delivery of export cargo to logistics centers and border points.

In this regard, road transport is the main connecting factor between agricultural production and consumption.

Since most agricultural products are perishable, the time factor is very important in their transportation. Fruits and vegetables, dairy products, meat and fish products lose their quality if transported for a long time or stored improperly. This causes economic damage.

The main advantage of road transport is its speed and flexibility. If necessary, it is possible to quickly change the route and deliver the cargo directly to the desired destination. In particular, refrigerated trucks can be used to transport products to remote areas while maintaining their quality.

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Today, the introduction of GPS, digital monitoring and electronic control systems in the logistics system further increases the efficiency of road transport. This allows for real-time tracking of cargo, reducing transportation costs and controlling delivery times.

Economic efficiency of road transport

Road transport plays an important role in increasing the economic efficiency of the agricultural logistics system. Transportation costs constitute a significant part of the cost of agricultural products. Therefore, the proper organization of transport logistics leads to a decrease in product prices and increased competitiveness.

Optimization of transport processes provides the following results:

- fuel costs are reduced;
- empty trips are reduced;
- cargo delivery time is reduced;
- product losses are prevented.

As a result, both the manufacturer and the consumer receive economic benefits.

Also, road transport has a positive effect on the development of the economy of rural areas. A well-developed transport infrastructure enhances the integration of farms with the market, creates new jobs and helps increase the income of the population.

Problems in the agricultural logistics system

Nevertheless, there are some problems in the use of road transport in the agricultural logistics system. In particular:

- poor quality of roads in rural areas;
- outdated vehicles;
- high fuel prices;
- lack of logistics centers;
- low number of refrigerated vehicles.

These problems negatively affect the timely delivery of products and increase transportation costs. Especially in the summer season, the lack of refrigerated vehicles for transporting fruit and vegetables can lead to significant losses.

In addition, the insufficient development of logistics infrastructure in some regions prevents the full realization of export potential.

Prospects for the development of the agricultural logistics system

The introduction of modern logistics technologies is important to increase the efficiency of road transport in the agricultural logistics system. Including:

- establishment of logistics centers;
- increase in the number of refrigerated vehicles;
- modernization of highways;
- introduction of digital management systems;
- use of environmentally friendly vehicles.

Also, the implementation of investment projects by the state to develop transport and logistics infrastructure will help increase the efficiency of the agricultural sector.

The introduction of modern logistics technologies is essential for increasing the efficiency of road transport in the agricultural logistics system. Several important measures can support this development:

Table 1

Modern Technologies in Agricultural Logistics

Modernization Area	Description	Impact on Agriculture
Establishment of Logistics Centers	Creation of regional storage and distribution hubs	Faster delivery and reduced product loss

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Increase in Refrigerated Vehicles	Expansion of cold-chain transportation	Preservation of product freshness and quality
Modernization of Highways	Improvement of transport infrastructure and roads	Reduced transportation time and costs
Digital Management Systems	Use of GPS, AI, IoT, and online tracking platforms	Better coordination and supply chain control
Environmentally Friendly Vehicles	Introduction of electric and low-emission transport	Reduced environmental pollution

The modernization of agricultural logistics systems significantly improves transportation efficiency. Advanced logistics centers, digital tracking systems, and modern highways allow agricultural products to be delivered more quickly and safely from farms to markets. Efficient transportation reduces delays, minimizes fuel consumption, and improves coordination between producers, suppliers, and consumers. As a result, the overall productivity of the agricultural supply chain increases.

Agricultural products, especially fruits, vegetables, dairy, and meat products, are highly sensitive to temperature and transportation conditions. The use of refrigerated vehicles and cold storage facilities helps preserve product freshness and quality during transportation and storage. Improved logistics systems reduce spoilage, damage, and waste, which leads to lower financial losses for farmers and suppliers.

A well-developed logistics infrastructure strengthens a country's ability to participate in international agricultural trade. Faster transportation, better storage conditions, and compliance with international quality standards make agricultural products more competitive in foreign markets. Efficient logistics systems also reduce export costs and delivery times, helping producers expand their access to global markets and increase export revenues.

Modern logistics systems help farmers connect more easily with local and international markets. Improved road networks and logistics centers enable farmers from rural areas to transport their products more efficiently and at lower costs. This creates greater business opportunities, increases farmers' incomes, and encourages the growth of small and medium-sized agricultural enterprises.

The introduction of environmentally friendly vehicles and green logistics technologies helps reduce harmful emissions and environmental pollution. Electric and low-emission transport systems contribute to sustainable agricultural development by decreasing fuel consumption and protecting natural resources. Eco-friendly logistics also support long-term environmental goals while improving the social responsibility of the agricultural sector.

Conclusion. Road transport is one of the most important links in the agricultural logistics system. It ensures the smooth and efficient operation of the process of delivering agricultural products from the place of production to the consumer. The speed, convenience and flexibility of road transport make it possible to transport agricultural products with high quality. Road transport is also of great economic importance in reducing logistics costs, increasing export potential and developing the economy of rural areas. Therefore, the modernization of the transport and logistics system, the use of modern vehicles and the development of infrastructure are important factors in the development of the agricultural sector.

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