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## PROSPECTS OF AGRO-LOGISTICS DEVELOPMENT IN THE CONTEXT OF ENSURING THE COMPETITIVENESS OF THE AGRARIAN INDUSTRY OF UKRAINE

*Ushkalenko I.*

*Candidate of Economic Sciences, Associate Professor  
of the Department computer science and economic cybernetics,  
Vinnytsia National Agrarian University  
Vinnytsia*

### **Abstract**

In today's globalization, trade between countries is characterized by trade liberalization. The increasing volume of international trade necessitates the search for the best and most advantageous ways of transporting goods. For Ukraine, agricultural products account for a large share of total exports, because even under difficult socio-political conditions, agro-industrial complex remains the main supplier of currency resources in the country. The share of agricultural exports from Ukraine reaches 35-40% of the total volume of foreign trade.

However, despite these advantages, the agro-industrial complex of Ukraine also has some problems that slow down the development of the agricultural industry and the country's economy as a whole. To solve the problems of agro industrial complexes, logistics is the most effective direction today. However, in order for the application of logistics in the agricultural sector to be effective, it is necessary to distinguish a specific direction of logistics - agro-logistics. That is, the necessity and relevance of studying the basic aspects of the development of agro-logistics in Ukraine today is beyond doubt.

Theoretical bases of development of agro logistics as a separate sphere of logistics are investigated. It is determined that efficient logistics and a perfect transport system today are the basic condition for the dynamic development of any economy, it is stated that to offer the consumer a product that will meet all its requirements - not enough, it is also necessary to rationally choose a delivery method that will help, first of all, significantly reduce costs and get new customers.

The basic components of agro-logistics - logistics of sales of agricultural products and logistics of logistics of agricultural enterprise. It is determined that the main task of the implementation and maintenance of the efficiency of agro-logistics is a comprehensive study of the economic efficiency of the use of their logistics systems at production and processing agro-enterprises.

It is analyzed that losses of agribusinesses in the process of transportation make about 15-25%. The world experience of agro-logistics development is investigated, the main domestic companies engaged in international freight transportation are generalized. The National Strategy «Drive Ukraine - 2030», which aims to transform Ukraine into a developed, high-tech and innovative country thanks to the development of the sphere of transport and infrastructure, the use of the latest technologies, is characterized. The main goals of this strategy are identified, the main gaps are outlined and the main problems that hinder the development of agro-logistics in Ukraine are outlined.

**Keywords:** logistics, agro-logistics, agriculture, freight transportation, road transportation, rail transportation, sea and river transportation, air transportation.

**Problem statement.** In today's globalization, trade between countries is characterized by trade liberalization. The increasing volume of international trade necessitates the search for the best and most advantageous ways of transporting goods. For Ukraine, agricultural products account for a large share of total exports, because even under difficult socio-political conditions, agro-industrial complex remains the main supplier of currency resources in the country. The share of agricultural exports from Ukraine reaches 35-40% of the total volume of foreign trade. However, despite these advantages, the agro-industrial complex of Ukraine also has some problems that slow down the development of the agricultural industry and the country's economy as a whole. To solve the problems of agro industrial complexes, logistics is the most effective direction today. However, in order for the application of logistics in the agricultural sector to be effective, it is necessary to distinguish a specific direction of logistics - agro-logistics. That is, the necessity and relevance of studying the basic aspects of the development of agro-logistics in Ukraine today is beyond doubt.

When researching logistics processes in the agricultural sector, it is worth paying attention not only to optimizing the transportation of products, but also to the proper storage conditions. Ukrainian producers have the capacity to store 40-50 million tons of grain products, but only about half of them are certified. At the same time, all grain elevators in Ukraine must be certified on an annual basis. Storage quality is another problem. The scarcity of modern elevators in Ukraine is working for the benefit of grain traders who exploit the capabilities of their own upgraded private elevators. Thus, the study of the system characteristics of logistical support of the agrarian sector of the economy is very important and essential in the conditions of increasing export capacity [1, p. 60].

**Analysis of recent research and publications.** The general theoretical and applied problems of logistical support of agricultural sector of economy are analyzed in the works of Babiy M.V., Kysh L.M., Kormyshkina YU.A., Lebedynska O.I., Potapova N.A., Sumets O. and others. These studies have certainly made a significant contribution to the study of the theoretical and practical aspects of the development of

agro-logistics, but they do not form a comprehensive understanding of the further development of this area of logistics.

**Goals setting.** The purpose of the article is to investigate the prospects for the development of agro-logistics as one of the main conditions for ensuring the competitiveness of the agricultural sector of Ukraine.

**Presentation of the main material of the research.** As of the end of 2019, the dynamics of exports

of goods from Ukraine in continental terms was as follows: the largest share was Europe (42.8%), Asia (30.3%), CIS countries (13.6%), Africa (10%), America (2.9%). In terms of export structure, the largest share of total exports is made by agricultural products and the food industry (Fig. 1) [1].

Based on the above data, it is obvious that there is a need to develop a separate logistics unit in Ukraine, which will specialize in optimizing the transportation and storage of agricultural products - agro-logistics.

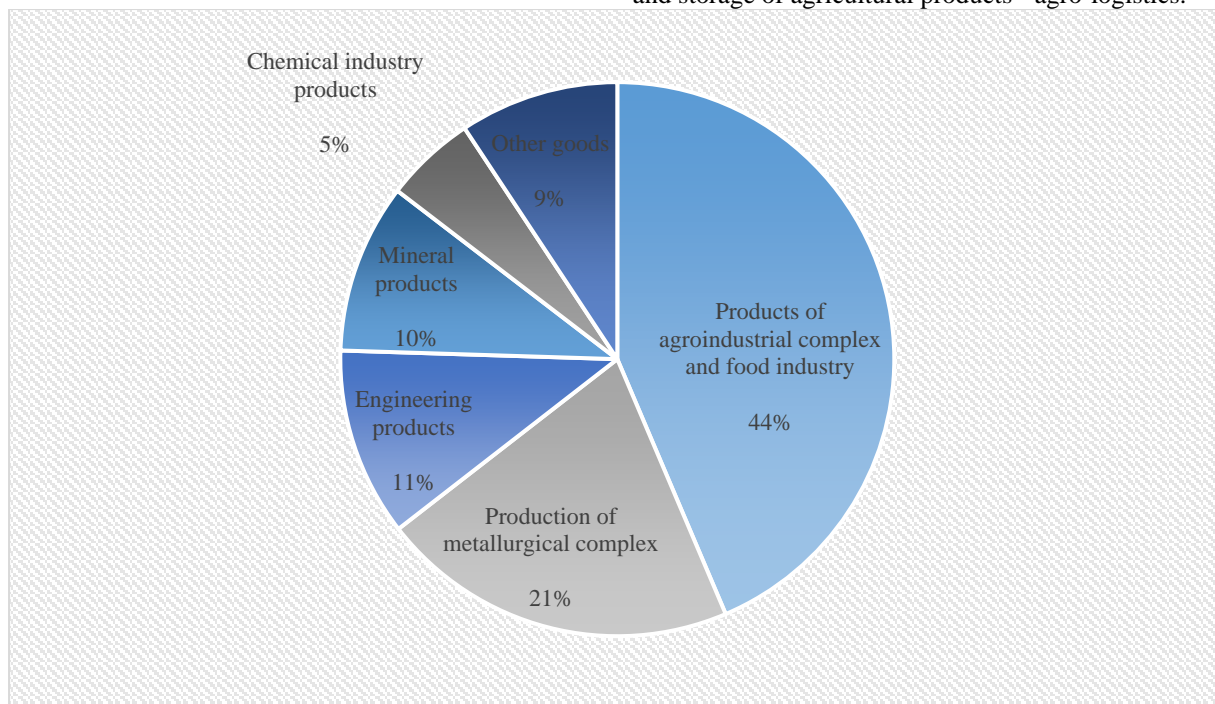


Fig. 1. Structure of export of goods from Ukraine for the 11 months of 2019

Source: generalized by author based on data [1]

According to Koromyshkin Yu.A. agro-logistics is the newest applied line of logistics related to the comprehensive implementation of its methods and provisions in the field of agro-industrial production [2, p. 34].

Sumez O. under the term «agrologistics» understands the scientific and practical direction in the management system of economic entities of the agricultural market, which provides an opportunity to increase economic efficiency by reducing intra-firm costs associated with the implementation of logistics operations and processes during production, storage and transportation agricultural production and information about it at a certain logistic range within the established time limits, and ensuring timely and high level of quality of customer service [3, p. 121].

According to researches of scientists, two main models of logistic organization of agrarian business are being formed now:

1. Corporate - successive stages of supply, production support and distribution are within one or several individual controls. Purpose - maximizing corporate financial results;
2. Cooperative - controlled through democratic governance and multi-stakeholder co-ownership, mainly on a non-profit basis. The purpose is to minimize logistics costs and increase the profits of owners (members) of the cooperative [2, p. 37].

Logistics of the agro industrial complex includes the resourcing of agro industrial complex and sale of finished products (Fig. 2).

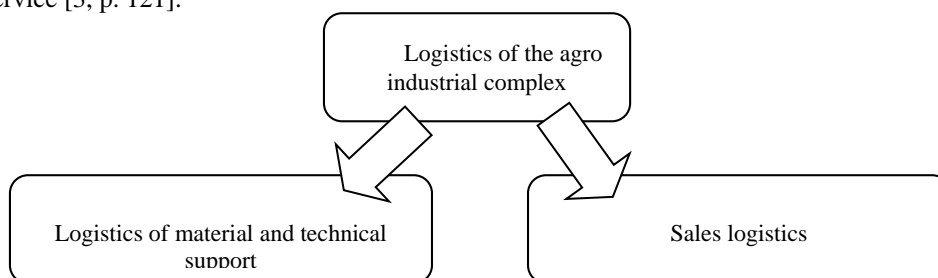


Fig. 2. The structure of the logistics of the agro industrial complex

Source: Generalized by the author

Therefore, the main task of implementation and maintenance of the efficiency of agro-logistics is a comprehensive study of the economic efficiency of the use of their logistics systems in production and processing agro-enterprises, namely: warehouses, means of transport, as well as features of their application in different seasons during transportation of agro-products. and agricultural cargo according to the needs and needs of the consumer market. The latter is important

for the organization of efficient logistical activity in certain enterprises, as, for example, in the crop production technological transport accounts for 60-70% of the total volume of domestic transport work, and the complexity of their performance in the production of basic products - 15-20% of the total costs works [3, p. 121].

In 2019, transport enterprises transported 676.0 million tons of cargo, which is 108.2% of the volumes of the same period in 2018 (Table 1).

Table 1

Cargo transportation in Ukraine, 2018-2019

Indicators	Cargo turnover, 2019		Cargo transported in 2019	
	million thousand km	in % by 2018	million tons	in % by 2018
transport	338962,5	102,4	676,0	108,2
railway	181844,7	97,6	312,9	97,1
automobile	48906,3	114,9	244,2	130,5
water transport	3387,8	100,7	6,1	109,0
pipeline	104528,1	105,3	112,7	103,0
air	295,6	87,0	0,1	93,4

Source: generalized by author based on data [4]

Analyzing the data of the State Statistics Service, we can see that both the index of cargo turnover and the volume of goods transported in 2019 are the highest for railway transport - 181844.7 million tones of km and 312.9 million tons respectively, but these figures are lower compared to similar to 2018. The largest increase in cargo turnover and volume of transported goods in 2019 compared to 2018 is observed for road transport - 114.9% and 130.5% respectively.

The leading role in the internal transportation of goods belongs to the railway. The railway of Ukraine has a developed network of about 22,000 km. Almost 70% of the country's rail lines are equipped with state-of-the-art control systems and automatic locking systems. The Ukrainian railway system is connected with railways in Russia, Belarus, Moldova, Poland, Romania, Slovakia and Hungary, uses six railways connecting all regions of the country and serves 18 seaports in the Black Sea-Azov basin. At the same time, after 2014, due to the occupation of part of the territory of Ukraine, a logistical connection was also disrupted, which significantly affected the goods flows in the country. High deterioration of rolling stock and inefficient use of Ukrzaliznytsia causes logistical obstacles for Ukrainian agricultural market operators [5, p. 62].

Consider the opportunities and problems of river transport in Ukraine. The first important advantage of river transport is its cheapness, ready-made nature trails, lower cost of investment for keeping them in good condition for carrying out transport operations.

The main transport arteries are the Dnieper rivers and its tributaries of the Desna and Pripjat, the Danube, the Dnipro-Bug channel. This gives access to the ports of the Baltic, Black and Mediterranean basins, allowing us to trade. Problems of water transport are physically outdated fleet of data cars, shortage of special river-sea vessels, multi-tonnage vessels, it is necessary to deepen the fairways for a number of years, to increase the terms of seasonal operation of the vessels, providing them with the necessary navigation support [6, p. 133].

Experts estimate that the losses of agribusinesses in the transportation process are about 15-25%. Their reduction is possible due to the use in the transport process of pre-packing of agricultural products and involvement in transportation of modern vehicles equipped with GPS-navigators, refrigeration equipment, etc. The experience of the Netherlands and Japan, where packaging is used to extend the shelf life of agricultural produce, indicates that the latter can be reduced by up to 30% during transport. And the use of modern means of transport in combination with the logistical planning of schemes and routes of delivery of agricultural products from producer to consumer in the Netherlands has allowed to reduce its transportation losses up to 10% [3, p. 124].

If we talk specifically about the types of transport and the constraints on the development of each of them, we can distinguish these (Fig. 3).

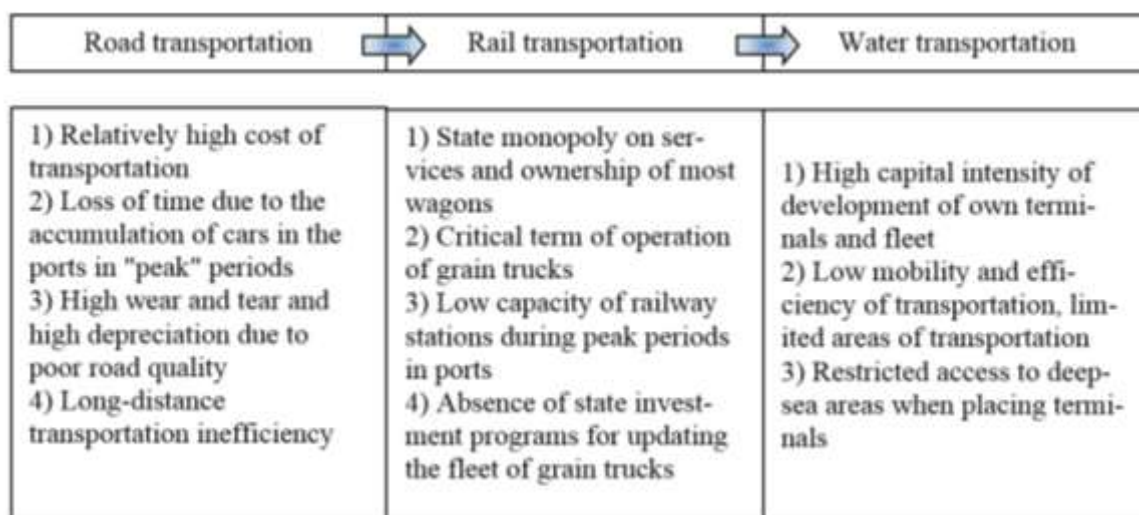


Fig. 3. Restraining factors for the development of certain modes of transport

Source: author-generated

In order to increase the level of agro-logistics development in Ukraine, it is necessary to study world experience, because in developed countries (USA, Western Europe, Canada, Australia) logistics approaches in agribusiness are used quite effectively (Fig. 4).

In the Ukrainian agro-food market, agro holding has a positive experience in the practice of management PAT "Myronivskyy khliboproduct", "Agro Invest Ukraine Company", agricultural enterprise "NIBULON", Agro-Maas NV, TERRA FOOD, "Kernel Trade". An example of effective, albeit fragmented agro-logistics, is the experience of "Danon" and "Zhytomyrskyy maslozavod" (TM "Rud"). Agrologistics was also effectively organized at the PAT "Hlobynskyy myasokombinat".

The fact of development of agro-logistics in Ukraine is confirmed by the formation of the market of relevant logistics operators.

These are PAT "Ukrainian Agrarian Investments", PrAT "Rise", as well as companies that market such brands as "Stozhar", "Chumak", "Generous Gift", "Lyubonka". The aspect of logistics in their activity is

very clearly traced - it is well-planned and organized in time and space technologies of delivery of products to consumers, as well as modern warehouse complexes and technologies of storage of agricultural products [3, p. 123]

International transportation of agricultural products is handled by many logistics companies, which promptly, with exact adherence to all legal rules and regulations, carry out the delivery of goods. Delivery of international cargo depends on many factors, destination, type of transport, urgency, name, volume and weight of cargo, invoice value, period of transportation, method of shipment.

"KIY AVIA CARGO COMPANY" has been working in the international freight market for more than 10 years, carries out customs clearance of import and export, provides professional services that ensure a reliable process of dealing with cases, and prevents risks in the most difficult and unusual situations arising in the process of customs clearance.

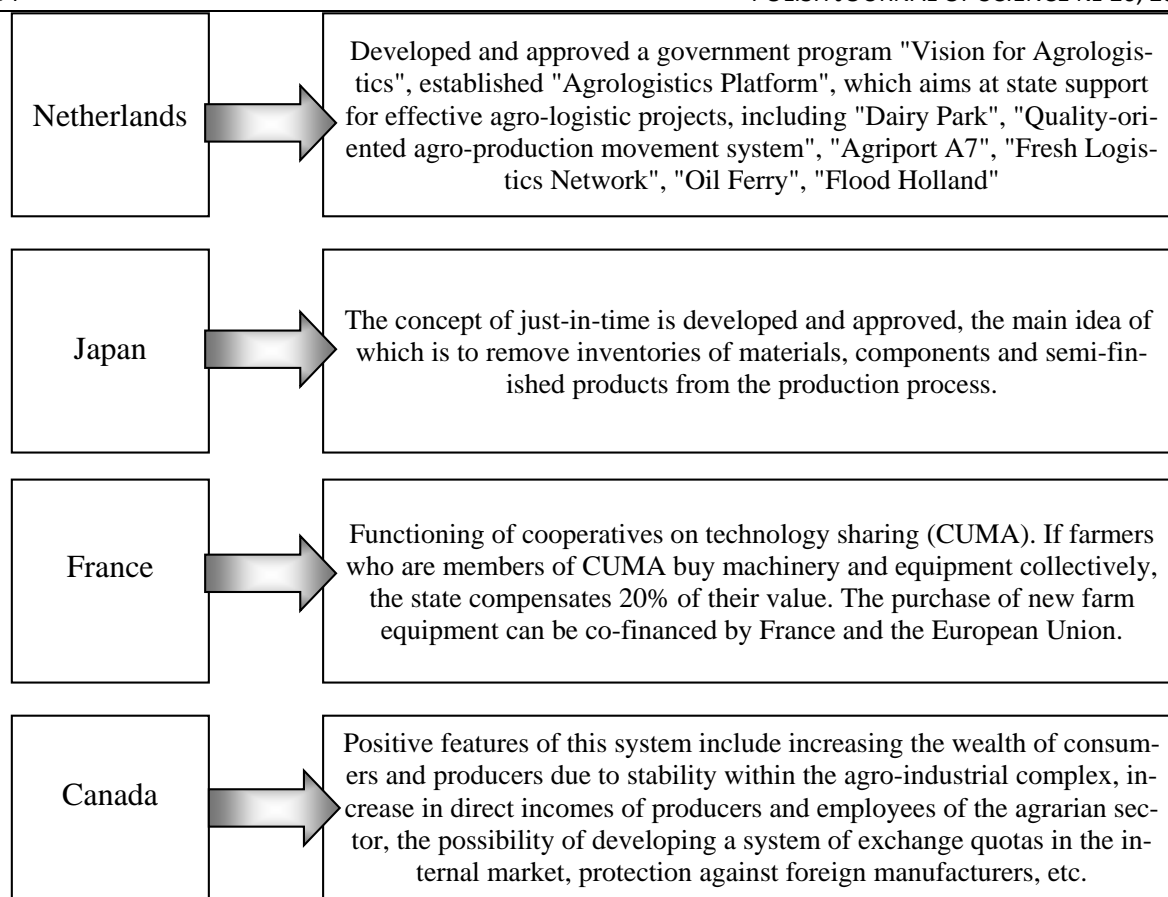


Fig. 4. World experience in the development of agro logistics

Source: [2, p. 35]

For producers of agricultural products of any form of ownership "KIY AVIA CARGO" provides "services for transportation of agricultural products at favorable tariffs. "KIY AVIA CARGO" specializes in transportation of cargo by sea to different countries of the world from ports of Ukraine in 20 and 40-foot containers. Today, the most popular is container shipping, which is used to transport from different countries to the Ukraine under the scheme FCL (Full Container Load) and LCL (Less Than Container Load). Transportation of sea containers and cargo is carried out by own transport, which makes it possible to greatly simplify the organization of shipment and delivery to the recipient [7, p. 98].

Complexly approaching rendering of services in grain transportation, "KIY AVIA CARGO" provides preparation of all freight transport documentation in full compliance with international standards and peculiarities of customs legislation of the importing country. In addition, it is obligatory to obtain phyto-sanitary certificates and sanitary-epidemiological conclusions, control of preparation of grain for transportation, the process of degassing, humidity level should not exceed 1.5%, cargo insurance will minimize the risks of the shipper [7, shipper. 99].

ZAMMLERGROUP logistics companies are represented in the world by an extensive network of representative offices and partners. These companies provide a full range of logistics services for all types of transportation, customs clearance, cargo storage and export-import operations.

ZAMMLER is the first Ukrainian 3PL operator. This company has been on the market for 10 years. During its work, ZAMMLER was one of the top five logistics companies in Ukraine. ZAMMLERGROUP's mission is to develop the logistics industry in Ukraine and international trade relations. The aim is to provide the most convenient service at the level of European logistics standards.

Important in the logistics chain is the availability of sufficient capacity of elevators, which have modern equipment for loading and unloading of grain material, its drying, control, etc. And critically important - the state must ensure the conditions and implement the construction of quality access roads to and from the elevators. Shipment on high-grade elevator complexes should be carried out at least by rail and, if possible, by river. Road transport should be used as a link in the overall transport chain using its flexibility property [6, p. 133].

The capacity of Ukrainian granaries varies from 25,000 tons to 200,000 tons, and the capacity of each individual elevator is 8,000-25,000 tons. The Poltava, Odesa, Dnipropetrovsk, Vinnytsia and Kirovograd regions have the largest grain storage volumes in Ukraine, accounting for 38% of the total national capacity. Considering further investments in storage infrastructure, the total capacity of the elevators will increase to 12-15 million tons in the next 10 years.

It should be noted that state operators are the main players in the market for storage of agricultural products in Ukraine. They have a total storage capacity of

approximately 5.6 million tons, or 18% of the total. The Grain Corporation of Ukraine, which includes Bread of Ukraine, is the largest owner of elevators in the country and the most powerful state operator.

Traders represent the second largest group of warehouse owners who have modern elevators to store agricultural products. The Swiss company Glencore has a total storage capacity of 1.9 million tons (6% of the total) in Ukraine. This company is the largest among private companies. "Nibulon" is another major exporter of agricultural food products with a storage capacity of up to 1.6 million tons (5% of total volume). The infrastructure of this enterprise includes a modern terminal, the Mykolaiv port, elevators and river terminals in Dnipropetrovsk, Cherkasy, Poltava and Zaporizhzhya regions. The major integrated agricultural companies have a combined capacity of 6.2 million tons, or more than 20% of the country's total capacity. Ukrainian agro-industrial enterprises have invested over \$ 150-250 per 1 ton of agricultural storage. In this case, the costs associated with the construction of a new elevator can be reimbursed in 5-7 years [5, p. 65].

To improve the functioning of logistics systems in Ukraine there is a program "Tatic", which is funded by the European Union and provides for improvement of logistics systems. The aim of the project is to: increase profits and improve the social and economic well-being of the rural population; activation of the privatization

process, promotion of agricultural products to foreign markets.

The purpose of this project includes a number of goals: to increase the access of agricultural producers to new marketing and logistics channels; to develop new and to optimize already existing channels of sale of agricultural products; introduce and develop marketing and management skills in supply and marketing chains; to promote market transparency and balance of interests of all participants of marketing channels; to increase the competitiveness of agricultural enterprises in terms of supply, quality and price of products; to assist in the development of purchasing and marketing strategies aimed at meeting the specific needs of businesses; assist in the preparation of legislation and regulations aimed at improving agricultural marketing in accordance with the practice and experience of EU countries and international standards [8].

Building a modern state requires a modern approach. Thus, the Ministry of Infrastructure of Ukraine has developed the National Drive Ukraine Strategy - 2030, which is expected to be the driver of economic and social transformation in Ukraine [9].

Drive Ukraine 2030 - Transformation of Ukraine into a developed, high-tech and innovative country through the development of transport and infrastructure, the use of new technologies. The main goals of the National Drive Ukraine 2030 Strategy are summarized in Fig. 5.



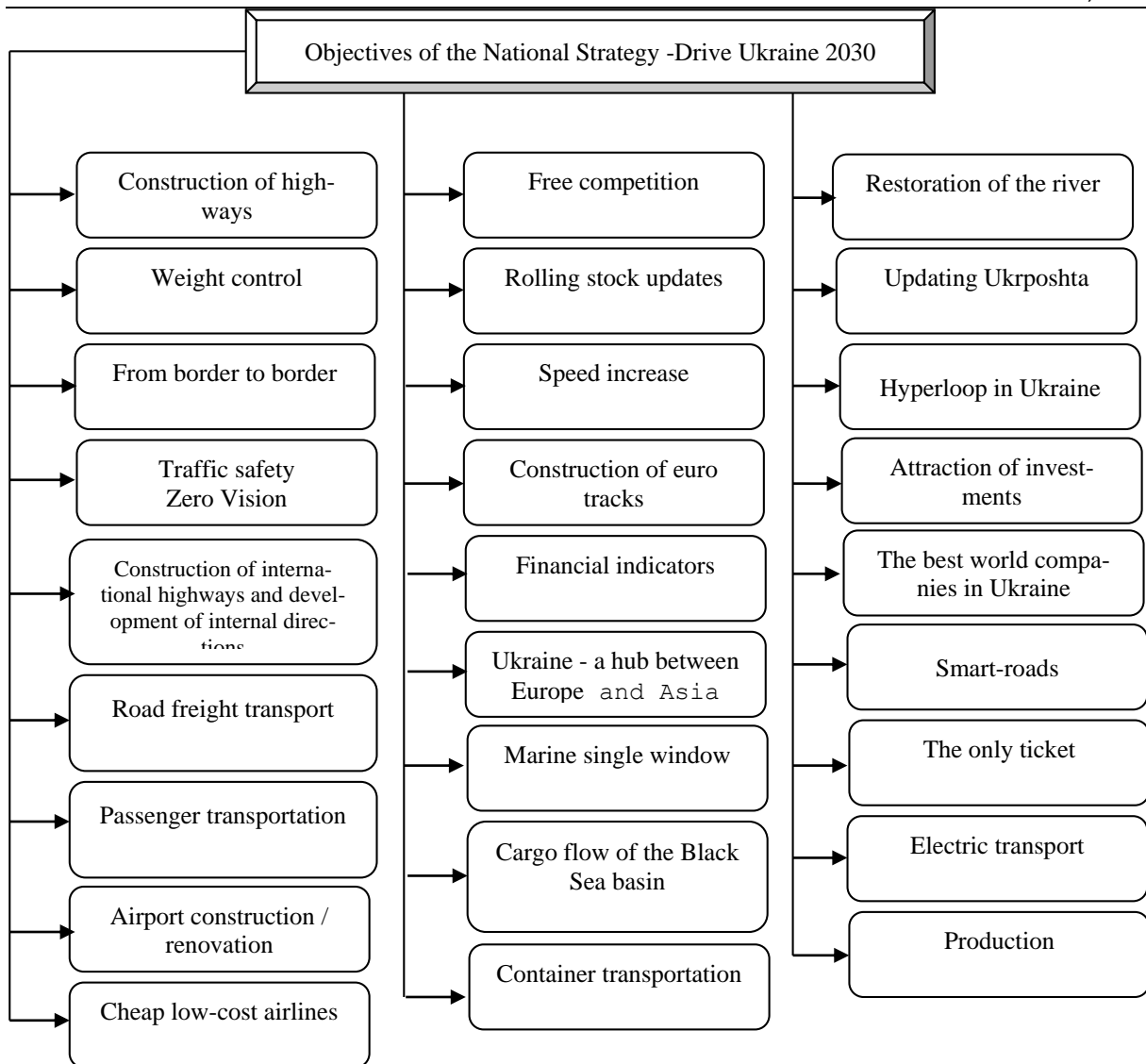


Fig. 5. Goals of the National Drive Ukraine 2030 Strategy

Source: generalized by author based on data [9]

Analyzing the main goals of the Drive Ukraine Strategy - 2030, which are defined by the Ministry of Infrastructure of Ukraine, it is possible to note that by 2030 there are plans to build 10 highways on the principle of concession roads in Ukraine; install more than a set of automatic weight control; ensure speed and safety of traffic in Ukraine, reduce infant mortality to 0%, reduce road injuries by 90% and allocate UAH 35 billion from the Road Safety Fund; to build international highways: Go Highway, Via Carpatia, continuation of Odessa-Reni to Greece, as well as development of internal directions: Lviv-Kyiv-Kharkiv-Donetsk, Kiev-Kerch, Poltava-Dnipro; measures will also be taken to promote investment in Ukraine, namely the development of agricultural logistics, the transition to electric transport, 2 factories for the production of electric cars and batteries, as well as the capacity of producing: trucks, aircraft, sea and river vessels will be built. electric traction [9].

Concerning road haulage, there is an urgent need to restore the Ukrainian freight car fleet, the total gross investment required to upgrade the heavy truck fleet in

Ukraine amounts to 5.9 billion euros, but the cost savings from fuel will make it possible to increase the cost-effectiveness of such fleet. save 2.4 billion euros, fleet productivity (km of transportation / car) will increase by 35%, the total number of cars will decrease by 22%. Thus, by 2030 Ukraine will be able to improve its transport fleet to international standards and to take a leading position in the structure of international freight traffic. 5 of the 11 global branches of Hyperloop high-speed land transport can pass through the territory of Ukraine, three of which are crossed through Kyiv: the first will connect China, Europe and Canada; the second - Asia, the Middle East, Europe and North Africa, the third - Spain and China. From the Dnieper and Kryvyi Rih, such a vehicle will be accessible to India, and from Kharkiv, Donetsk or Odessa to America [9].

The aviation industry requires an increase of operating airports to 50, reduction of the average time spent on the road to the airport from anywhere in Ukraine to 1 h, reconstruction of the second runway at the airport "Boryspil", extension of flight geography (350 destinations for flights from all airports in Ukraine), ensuring

the share of low-cost segment in air transportation up to 50% and more.

The improvement of the railway industry, according to the Strategy, envisages ensuring free competition on the railways, for example, the infrastructure and the railway are state-owned, while the rolling stock, locomotives are in the state as well as in private ownership. The relevant bill was drafted by the Ministry of Infrastructure and tabled in Parliament.

Joint production of rolling stock is envisaged on the basis of cooperation between Ukrzaliznytsia with the Kryukiv Railway Works and world companies: General Electric, Bombardier, Greenbrier, as well as increasing the average speed of the railway up to 150 km / h. With successful cooperation by 2030, it is possible to replace 100% of the locomotives and upgrade the wagon fleet by 100%. The relevant contract between Ukrzaliznytsia and General Electric has already been signed. At the Kyiv-Odessa, Kyiv-Lviv, Kyiv-Kharkiv, Kyiv-Dnipro junction, the track should be replaced by the European standard track. These steps will make Ukrzaliznytsia one of the top 5 railroads in the world by financial indicators [8].

Ukraine is a hub between Europe and Asia, so it can seriously declare itself as a participant of the New Silk Road project, which requires a transparent and effective customs clearance mechanism, a high-quality system of rail and highways.

The maritime and river industries require the creation of a "single window" in all Ukrainian ports (an information system that will allow orderly collection and analysis of vessel data), elimination of the corruption component, the advantages of this type of transportation are low tariffs and comfortable logistics. It is planned that 30% of the cargo served by Ukrainian ports will be in the Black Sea basin, as well as Ukrainian ports will be included in the TOP-100 rating of the largest container ports in the world. Activate river freight transportation in Ukraine up to 50 million tons per year [9].

Even if the government and parliament adopts all the necessary legislation, it will not automatically infuse billions of dollars into agro-logistics and the emergence of new grain carriers. To raise \$ 28 billion. foreign investment in public-private partnership projects in infrastructure, Ukraine will have to compete with Brazil, China, India and Turkey. These countries have large markets, with populations ranging from 80 million to one billion people, and ranked 27 to 80 in the Global Competition Index [10].

Analysis of the current state of agricultural logistics in Ukraine allows us to conclude that the main obstacles to development are:

- 1) not ensuring the development of agro-logistics in Ukraine by government programs at the legislative level;
- 2) the absence of highly qualified logistic specialists at agricultural enterprises;
- 3) lack of financial resources for the implementation of logistic approaches, as software logistics products are too expensive for domestic enterprises;

- 4) insufficient financing for the construction of modern warehouses and the purchase of modern vehicles;

- 5) significant damage to the road surface, imperfection of digital GPS software on Ukrainian roads and lack of a network of communication systems for large-scale transport;

- 6) unattractiveness of agriculture by investors, which is caused by political instability in the country;

- 7) high corruption component in the country.

The efficiency of Ukrainian agricultural production depends on the effectiveness of solving these problems and removing obstacles. Only with the establishment of logistical support it is possible to form closed cycles of production of value added products, to move from raw material production to production of finished goods.

**Conclusions.** Thus, based on the conducted research, it should be noted that today the problem of the development of agro-logistics as a separate unit of general logistics is extremely urgent.

The use of agro-logistics tools enables our country to increase agricultural exports. Thus, given the information available on the losses of the agricultural sector due to «inefficient logistics» and the European and partially Ukrainian experience of managing agricultural enterprises, it can be stated that the use of agro-logistics in the production, processing, storage and transportation is highly efficient. In addition, comprehensive adherence to the rules of logistics (logistics mix) makes it possible to significantly improve the level of customer service and improve the relationship between all participants in the agricultural market.

The intensive development of agribusiness in Ukraine is impossible without a developed transport infrastructure, since the problem of agro-logistics is a key issue for Ukrainian farmers. In order to intensify the development of the agricultural logistics system in Ukraine, it is necessary to take measures to solve the problems outlined, for example, the lack of highly qualified logistic specialists, the lack of financial resources for the implementation of logistics approaches, the unattractiveness of agriculture by investors and others. The efficiency of Ukrainian agricultural production depends on the effectiveness of solving these problems and removing obstacles.

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## INNOVATIVE ACTIVITY AS A FACTOR FOR IMPROVING COMPETITIVENESS OF AGRICULTURAL ENTERPRISES

**Chikov I.**

*Postgraduate student\*, assistant of the department of computer science and economic cybernetics  
Vinnytsia National Agrarian University,  
Vinnytsia, Ukraine*

### Abstract

The article deals with the issues of the influence of the business entity's innovation activity on the state of its competitiveness in the agro-industrial complex. The essence of innovative activity of agrarian enterprises in agro-industrial complex is highlighted, its features and key differences are revealed. The economic essence of innovation and innovation by different scholars is considered. The ways of increasing the competitiveness of agricultural enterprises through the prism of the systematic introduction of innovations under the market economy system in the conditions of globalization are described. The factors contributing to the development of the introduction of innovations in the enterprise and those that impede or prevent the introduction of innovative technologies in the production and processing of agricultural products and the development of the management system and its individual components in the enterprise are analyzed, which in turn directly or indirectly affects efficiency of the business entity in the market in conditions of high competition. The problems of the external environment affecting the introduction of innovative technologies at small and medium enterprises, in particular at the state level, are described in the part concerning the introduction and development of an effective mechanism for stimulating the development of innovation activity at the enterprises of the agro-industrial complex. Considerable attention has been paid to promising directions of innovation development in the part of increasing the competitiveness of the enterprise, namely, the focus is on the development of environmentally safe innovations in the context of the concept of sustainable development and taking into account the negative influence of the management of a highly intensive method of cultivating crops and, accordingly, in this regard, improvement of the investment climate both in the agro-industrial complex as a whole, and in the field of ecologically safe technologies in particular.

**Keywords:** innovation, innovation activity, agrarian enterprises, agro-industrial complex, agriculture, balanced development, competitiveness.

\* Scientific supervisor - Doctor of Economic Sciences, Professor of the department of computer science and economic cybernetics Koliadenko S.V.