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**STRUCTURE OF THE TRANSPORT-LOGISTICS CLUSTER AND
ITS FORMATION PROCESS**

**СТРУКТУРА ТРАНСПОРТНО-ЛОГИСТИЧЕСКОГО КЛАСТЕРА И
ПРОЦЕСС ЕГО ФОРМИРОВАНИЯ**

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У статті проаналізовано поетапне формування транспортно-логістичного кластеру на прикордонній території України та Угорщини. Обґрунтовано необхідність та переваги створення транспортно - логістичного кластера в Причорноморському регіоні України..

Problem statement in general terms. Study of the structure of a modern transport-logistic cluster and the process of its formation is a significant scientific and practical interest due to the market transformation of the national economy, as well as in a context of dynamic merger of Ukraine into international economic relations and European economic integration in general. The study shown in this article was performed on a sample of a transport-logistic cluster located in a border area of Transcarpathian region. Dynamic expansion of globalization processes of world economy along with a liberalization of markets rises an increasingly urgent question of competitiveness of regions' production and thus it is no coincidence that in public programs – i.e. the program for establishment and functioning of a national network of international transport corridors in Ukraine as well as in the integrated approval program for Ukraine as a transit state has been foreseen the establishment of a modern transport complex integrated into the global production. The Formation of a transport-logistic cluster on Transcarpathian territory and its further integration with logistic cluster in the town of Zagon' (Hungary) within the trans-border region due to the need for integration of transport networks and Ukrainian transport into international transport system to attract additional cargo transportation volumes and currency receipts and to reduce transport costs and to make transportation of passengers and cargoes similar to international standards, to reduce the energy and environmental performance of transport and to increase Ukrainian export potential on international market of transport services by significantly increasing of competitiveness of Ukrainian motor carriers along with a modernization of Ukrainian transport system.

For research works was used a dialectical method of cognition as well as a systematic approach. For the synthesis of theoretic and methodological principles of innovative activity were used techniques for abstract-logical method, and namely: analysis and synthesis, induction and deduction, comparison, analogy and comparison methods, graphic and tabular presentations. Proposals for formation of the innovation strategy were substantiated with methods of design analysis and monographic research.

Research works of Ukrainian and foreign scientists along with regulatory and legal

acts of Ukraine, laws of Ukraine, Resolutions of the Cabinet of Ukraine, international agreements, documents passed by European Commission and the Council of Europe were used as information data for that.

The important geographical location of Transcarpathian region, and above all the trans-border territory Zagon-Chop as a transit center and a natural bridge between Europe and Asia defined the relevance of this subject, which identifies the particular key of this border region of Ukraine in promoting of Euro-Asian transport-trade relations, including in the revival of one of the most ancient trade routes of the world- the Great Silk Road in a context of the further development of Europe-Asia transport corridor.

Taking into account the magnitude of projects of international traffics through Transcarpathian region and relevant strategic programs of related countries there is a need for the establishment of an international transport-logistic cluster which can be created exactly on the basis of existing transport companies located in Chop-Zagon area (Ukraine-Hungary).

The constant increase in transnational flows and international transit of cargoes through Ukraine define following priorities in Euro-integration processes of Ukrainian transport complex: a stage-by-stage transition to principles of international transport policy adopted by European Commission; introduction of provisions for participation of Ukraine in the establishment of a network of transport corridors; involvement in the creation of a network of transport corridors of domestic and foreign entities of all forms of their ownership; the transition to a market fundamentals of transport-road complex whose elements shall be considered the privatization of public enterprises, their demopolization and competition, etc.

Analysis of researches and publications performed within last few years. Cluster economic development models have become the objects for their analysis by some Ukrainian and Russian scientists: S.I. Sokolenko [1, pp. 100-116; 2, pp. 70-78], Â.B. Oliynik [3, pp. 45-49], V.M. Osipov, and V.I. Zakharchenko [4], M.V. Slipenchuk [5] and others. To problems of trans-border infrastructure development cooperation and competitiveness of transport-logistic systems was given in economic literature some clarification in a context of the research for formation of conditions to intensify the economic integration of Ukraine into the world economy. The studies of individual components of the transport infrastructure in Ukrainian frontier areas has been performed in a context of a trans-border cooperation by such Ukrainian scientists like P. Belenkiy [6], Krykavskiy [7], N. Mikula [8]; There are also monographic studies performed by A. Novikov [9] and Yu. Pashchenko [10].

Highlight of earlier unresolved parts of the general problem. Despite the undeniable achievements of scientists, the scientific analysis of international relations, trans-border economic cooperation from the perspective of the transport-logistic cluster is still not thoroughly performed; there are not enough research works on creation methodology of such transport-logistic clusters. The research described in this article has been dedicated to a partial resolution of this issue.

Task statement. The purpose of this scientific research is the formulation of methodological guidelines, the compilation of methodological foundations for the study and further creation of transport-logistic clusters.

Presentation of the main research material. First of all, the practice of cluster

analysis includes the definition of the need for cluster development in general, the formulation of realistic assessments of regional proportions and predicting of the economic situation, economic developments throughout the region (and not only in individual sectors of the economy of the region), the establishment of an integrated "portfolio" of the region. So, Doctor of economic sciences, Mister S. Sokolenko defines indeed the importance of a correct management along with a strategic choice as leaders and organizations caring about the economy of the region and as a ready-to-use cooperation processes of industry and academic institutions to improve the region's economy as well as the availability of a ready capacity to act as a tradition to meet the economic challenge with relevant technical and financial resources (including the willingness for cooperation for the sake of common profits).

Cluster-based economic development has four stage cooperation process:

Stage 1: Mobilization- which means creating the interest and partnership among different sponsors needed to implement the said initiative.

Stage 2: Diagnosis - i.e. the assessment of industrial clusters combining the economy and economic infrastructure providing the cluster's functioning.

Stage 3: Cooperation strategy — that is necessary to convince stakeholders (companies participating in the cluster as well as public institutions) to work in groups to define the priority goals and acts for resolving of specific problems.

Stage 4: Realization - means the formation of devotion sense of participants to work in cluster groups and personal interest of parties as well as the determination or creation of organization to support the realization of the said initiative [11, p. 814]

The cluster structure has following advantages:

- 1) it moves up on the market being concentrated at the same time on creation of such opposite parties of economy like demand and supply for more effective work;
- 2) it brings over both large and small companies as well as suppliers and supporting economic institutions to participate in the cluster;
- 3) the cluster unites its members by mutual solution of regional problems by participants who have their own interests;
- 4) the cluster assists the participants in creation of strategic prognosis of the future state of economy in their region which would be coordinated with various sponsors and could create the motivation and the liability of the parties;
- 5) the cluster creates values which deepen and extend the basis for the increase of regional income [11, p. 817]

In accordance with Resolution № 659-p "On complex program for approval of Ukraine as the transit state in 2010-2010" passed by the Cabinet of Ukraine on February, 7, 2010, one of main directions to increase the efficiency and quality of a transport service in an international traffic has been considered the passing to logistic technologies for organization of management of material streams in the process of supplying of the goods to the consumer [12].

Logics and methods of cluster strategy shall be more integrated into the practice of economic development in the future, which means that regions and, accordingly, their subjects will participate in creation of more integrated and market-directed surroundings of economic development. Thus, a project on Conceptions for creation of clusters in Ukraine was already developed in Ukraine at the state level in 2010. It is worth to be

marked that among four types of clusters that were marked in a project Conceptions by priority it was certain also creation of transport-logistic clusters.

It is worth to note that among the four types of clusters which in the draft the concept of priority were mentioned, the creation of transport-logistic cluster was also specially defined [13].

As per the Conception on creation of clusters in Ukraine the next types of clusters are to be marked especially:

1. Productive clusters – means the association of enterprises carrying out the production of goods (along with the provision of relevant services) by implementation of component operations (for example, enterprises of motor industry, aviation industry, shipbuilding, other industries of machine-building complex, organization of building industry and production of building materials) and also the association of enterprises related to chemical, pulp and paper as well as metallurgical industries, including also agriculture, food industry, etc.

2. Innovative-technological clusters mean the association of geographically located enterprises related to productive connections with the purpose of creation of innovative products and providing of services to subjects of such an innovative activity.

3. Tourist clusters have been formed on the basis of tourist assets located in the region which consist of enterprises of different spheres related to maintenance of tourists, for example, tourist operators, hotels, sphere of public food consumption, producers of souvenir products, transport enterprises and any other enterprises.

4. Transport-logistic clusters include the complex of the infrastructure along with companies specialized on maintenance, accompaniment and delivery of cargo and passengers. The cluster can also include organizations providing the services to objects of seaport infrastructure; companies specialized on marine, river, surface, avia transportations; logistic and any other complexes. Transport-logistic clusters develop in regions possessing a significant transit potential [8].

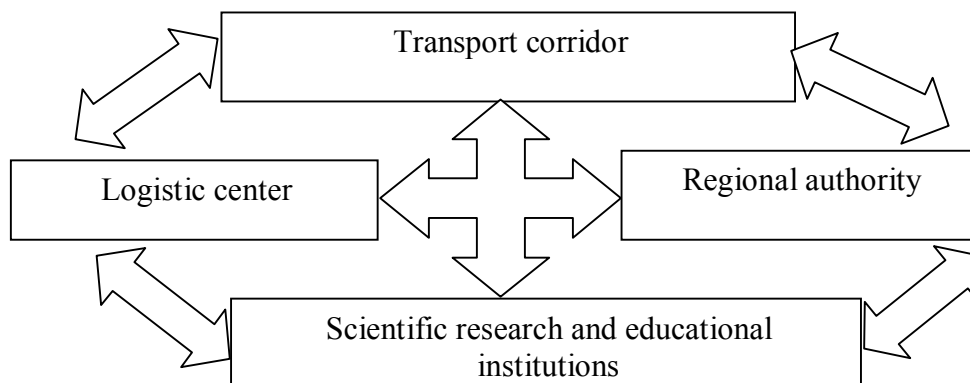
The effective creation of transport-logistic cluster occurs under condition of presence of favorable market initiatives and a high-quality transport infrastructure. The factor analysis of basic elements performed by us in relation to forming of regional transport-logistic cluster in Transcarpathian area allows us to define the main components of regional transport-logistic cluster in Transcarpathian area (Picture 1): the presence of the logistic center and innovative technologies, international transport corridor, regional authorities, research and educational institutions.

The transport-logistic cluster includes regional motor transportation enterprises, enterprises of any other types of vehicles, licensed warehouses, local authorities and research institutes, a network of modern communication connections which improve their cooperation and competitive advantages of the trans-border area.

Statistical data also confirm the strengthening of tendency for increasing of volumes of freight transportations in Transcarpathian region - both transit transportation (which makes more than sixty percents of general transportation volume of the common cargo traffic) as well as bilateral transportation with EU countries.

On the average 4,3 million tons of cargoes were transported in Transcarpathian region in the period from 1998-2010, and 13,2 million tons of cargoes were transported

by motor transport. 1160,7 thousand tons of cargoes were transported by business entities-entrepreneurs in 2010.



Picture 1. Basic components of Transcarpathian regional transport-logistic cluster

Next measures are of priority for a transport-logistic cluster in Transcarpathian area:

- forming of general informative base of ferrymen, loads, terminals, storage facilities, etc.;
- coordination of tariff-custom policy in regard to transportations by all types of transport;
- development of required training and educational programs and professional training of specialists that would meet the needs of cluster;
- planning of personnel policy; promoting to establishment faculties and departments on training of logisticians and other skilled professionals if required;
- realization and development of joint marketing initiatives;
- definition of problems existing on market of logistic services;
- providing of strategic information requested by firms (research for possibilities of implementation of newest technologies);
- maintenance the basic infrastructure (i.e. roads, communication, movable warehouses, etc.) in the proper condition;
- to increase the level of awareness about advantages of exchange with knowledge and further merger into the cluster;
- creation of platform for a further merger into the cluster (i.e. a network) and for exchange of information on regional, national and transnational levels.

That is possible to create a transport-logistic cluster on territory of trans-border area by taking into consideration such combinations of following factors like the indicator of transportations, innovativeness of a movable warehouse, the development of a transport infrastructure and providing of industry with labour resources.

The mechanism of functioning of transport clusters should also be supported by local authorities. Development of transport-logistic clusters has been formed on principles of permanent adjusting process of transportations; proportional development,

harmonization of interests and constant stimulation of participants of transportation process, its flexibility, logic, sequence, coordination, reliability, adequacy of its quality, openness, progressiveness, its compliance with a public transport-economic policy and efficiency.

In fact, the development of methodological bases in creation of clusters enables the increase of competitiveness of this region and allows to translate a new approach to the near development strategy including for regional economy.

Methodology in creation of transport-logistic cluster includes:

- determination of transport-logistic type of cluster;
- formation of its institutional and organizational structure;
- definition of composition of cluster's subjects;
- quantitative analysis of cluster and definition of structure of intercommunication between the cluster's participants;
- analysis of its competitive environment and innovative component of the cluster;
- definition of success level of the cluster.

Concerning foreign experience of partnership in forming of transport-logistic cluster Hungarian experience in development of border transport-logistic cluster in the town of Zagon is worth to be marked. On the basis of Resolution 2141/2009 concerning the necessity to develop the executable code of conception of logistic development in the town of Zagon and in its adjacent territories passed by Hungarian government in August, 2009. As a part of the complex program foreseen for development of border-line region in a context of its further development was defined exactly its logistic component. The Hungarian Ministry of Economy and Transport ordered experts of higher institutions and research centers to establish a consortium in regard to preparation of this objective document which could be implemented in reality. A document was developed within the context of development Plan for a modern Hungary within the period from 2009 up to 2015, and in this context the special attention was paid to EU Program dedicated to logistics (i.e. so called Galileo Program).

The town of Zagon and bordering territory uniting 11 settlements located in a border-line region (i.e. an area Sabolch-Satmar-Bereg), and its logistic specific has been defined due to presence of loading center maintained by Management of Hungarian railway, a wide network of 100 and 11 railway lines and 4 highways, and what especially important is that in this space there are railway lines which meet European standards as well as "eastern" railway lines – so called "space 1520" – these are territories with a single width of railway line of 1520 mm.

Forming of international logistic center and transport-logistic cluster in border-lined area of Chop-Zagon has been also determined due to the presence of warehouse areas and unloading-loading powers, terminals and other specialized enterprises related to transportations. Thus a Chop-Zagon station which destination countries are Hungary, Austria, Italy, Slovenia, Germany, Switzerland, France carries out the cargo delivery on a 1520 mm railway line, a railway line of 1435 mm has been used for cargo delivery deeply into Ukraine territory on distance up to 66 kilometers, and accordingly, a railway line of 1520 mm shall has been used for cargo delivery deeply into Hungary territory up to the station of Epereshke which is 4,9 kilometers, and up to Tornoshpoltse which is 14,4 kilometers, and to Komoro station the distance will be 15,6 kilometers, and up to the town

of Zagon the distance is 17 kilometers. Maximum axle load doesn't exceed 24,5 tons; on a railway line breadthways of 1435 mm the maximum axle load doesn't exceed 21 tons. Unloading of cargoes with railway lines breadthways of 1435 mm has been carried out at stations of Asproon, Batevo, Barkasovo, Mukachevo, Chornotissovo, the loading of cargoes with a railway lines breadthways of 1435 mm at these stations may be performed under contracts concluded between a consignor or a forwarder and the management of Uzhhorod railway station. Taking into account the magnitude of projects on providing of international transportation through Transcarpathian area as well as strategic programs of frontier countries and foremost Russia, China and Hungary - there is a necessity for formation of the international transport-logistic cluster that can be formed exactly on the basis of existing enterprises of Chop-Zagon traffic center (i.e. Ukrainian and Hungarian ones).

By using of relevant experience of Transcarpathian area which was described in this article we suggest to develop the special "Program on creation of transport-logistic centers on territory of the Black Sea region in Ukraine". To our opinion, the main goal of this program is to define prospects and to design transport-logistic centers for their further development on the territory of the said region; improvement of technology of international transportations in accordance with principles of logistic cargo transport systems with further involvement into it of local authorities, regional agencies and attracting of investments and economic development of these territories with a further establishment of trans-border cooperation.

Program recommended by us contains the model of formation of transport-logistic centers in Ukraine with functions of complex of transport services provided on both marine and land borders of Ukraine. The necessity of formation of transport-logistic centers on territory of the Black Sea region in Ukraine has been stipulated by following factors:

- territorial closeness with international transport highways as well as the developed and diversified traffic network;
- convenient economic-geographical location (marine border-line area); the presence of required infrastructure (transport, warehouses and connections);
- gravitation to present or perspective centers of business cooperation;
- presence of historically formed system of foreign trade connections with foreign partners and the basis for its development. According to our calculations the functioning of such centers in the Black Sea region of Ukraine will enable to reduce deliveries of cargoes up to 20% as well as to reduce the total charges spent on transportation of cargoes, to reduce the warehouse supplies up to 30% and to reduce the average time for execution of shipping documents up to 50%.

Conclusions and prospects for further developments. It is sensible to carry out the development of modern trans-border cooperation of Ukrainian regions by forming of clusters as an effective method of development of innovative entrepreneurial activity which may be performed under condition of transformation of Ukrainian economy. This way the new model of economy shall be created which shall be based on forming and development of clusters and that will become more competitive and attractive for investments on the international global market.

Accordingly, such creation of a logistic cluster in Western frontier of Ukraine shall become a solution for some problem questions of socio-economic, institutional character both on state, international, interregional and regional levels. In fact, the creation of a complex logistic system in a Western border-line area with forming of relevant transport-logistic centers will just assist to activate the merger of Ukraine into European transport network. Thus, this way will be also formed a powerful transport-logistic complex which will become a catalyst for involving of investment facilities of international financial organizations, and will also assist to develop the interregional cooperation and will unite European transport corridors. Exactly in this sense it is possible to talk about the use of trans-border center of transport corridors. Due to forming of transport-logistic complex will also increase the regional component of the general national economical complex.

Accordingly, forming of logistic cluster in a trans-border area as well as in border-line territories of Ukraine and Hungary will assist the development of the global system of international transportations and also the revival one of the oldest trade routes of the world – the Great Silk Way within a context of further development of a Europe-Asian transport corridor. Not the last role in this context shall be given also to realization of integration strategy of Ukraine into Europe.

We consider the use of cluster approach especially important in regard to the border-line regions of Ukraine which have direct borders with countries of European Union. It has been stipulated by presence of relevant factors existing in this region - such as a convenient geographical location, important geopolitical placing, presence of traditions in development of transport-communication routes, high coefficient of transitivity of region as a competitive advantage (which due to existence of serious competitive activity between transit states will have more requirements for improvement of a transport attractiveness and therefore further investments).

Actually, with formation of such network structure as logistic clusters, logistic centers, transport-logistic complexes in Ukrainian regions will be used first of all potential of regional economies and will be improved the functioning of regional structure of the state economic system. The implementation of cluster's approach and cluster's mechanisms in forming of transport-logistic complexes of Ukraine will assist the economic development of regions as well as border-line territories including.

The prospects of further scientific developments have been considered by us an active adaptation to Ukrainian terms of foreign and European experience in forming of transport-logistic clusters.

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Анотація

В статті проаналізовано поетапне формування транспортно-логістичного кластера на пограничній території України і Венгрії. Обґрунтовано необхідність і переваги створення транспортно-логістичного кластера в Причорноморському регіоні України.

Проведений нами факторний аналіз базових елементів, формуючих транспортно-логістичний кластер, дозволяє виділити наступні головні складові частини регіонального транспортно-логістичного кластера Закарпатської області: логістичний центр; міжнародний транспортний коридор; регіональна влада; науково-дослідницькі, освітні установи. Транспортно-логістичний кластер об'єднує регіональні автотранспортні підприємства, підприємства інших видів транспорту, ліцензійні склади, органи місцевої влади і науково-дослідницькі

институты, сеть современных коммуникационных связей, усиливающие взаимодействие и конкурентные преимущества транграничного региона.

Статистические данные свидетельствуют об усилении тенденции к возрастанию объемов грузовых перевозок Закарпатской области, - как транзитных (составляющих более шестидесяти процентов общего грузопотока), так и двухсторонних со странами Европы. В среднем за год на протяжении 1998 - 2010 г.г. железнодорожным транспортом в Закарпатской области отправлялось 4,3 млн.т. грузов, автомобильным – 13,2 млн.т. Предпринимателями-физическими лицами в 2010 году перевезено 1160,7 тыс.т грузов.

Приоритетными для транспортно-логистического кластера Закарпатья являются следующие мероприятия: формирование совместной информационной базы перевозчиков, грузов, терминалов, складских помещений и т.п.; согласование тарифно-таможенной политики по перевозкам всеми видами транспорта; разработка соответствующих программ образования и профессиональной подготовки, которые отвечали бы потребностям кластера; планирование кадровой политики; содействие открытию факультетов и кафедр по подготовке логистов и других специалистов для кластера; реализация и разработка совместных маркетинговых инициатив; определение проблем рынка логистических услуг; предоставление стратегической информации фирмам (исследование на предмет возможностей новых технологий); поддержка а надлежащем состоянии базовой инфраструктуры (дороги, связь, подвижной состав и т.п.); повышение уровня осведомленности о преимуществах обмена знаниями и объединения в кластер; создание платформы для объединения в кластер (сеть) и обмена информацией на региональном, национальном и транснациональном уровнях. На территории транграничного региона представляется возможным формирование транспортно-логистического кластера на основе учета следующей совокупности факторов: показателей перевозок, инновационности подвижного состава, развитости транспортной инфраструктуры и обеспеченности отрасли трудовыми ресурсами.

Механизм функционирования транспортных кластеров должен включать в себя и поддержку местной власти. Развитие транспортно-логистического кластера должно формироваться на следующих принципах: постоянной корректировки перевозочного процесса; пропорционального развития, гармонизации интересов и стимулирования участников перевозочного процесса; гибкости; логичности; последовательности; согласованности; надежности; адекватного качества; открытости; прогрессивности; соответствия государственной транспортно-экономической политике и эффективности.

По сути, разработка методологических основ формирования кластеров способствует повышению конкурентоспособности региона и позволяет реализовать новый подход к стратегии развития региональной экономики.

В ходе исследования нами установлено, что методология формирования транспортно-логистического кластера должна включать в себя: определение типа транспортно-логистического кластера; формирование его институциональной и организационной структуры; определение состава субъектов кластера; количественный анализ кластера и определение структуры взаимосвязей между участниками кластера; анализ конкурентной среды и инновационной составляющей кластера; определение степени успешности кластера.

Перспективы дальнейших научных исследований связаны с изучением возможностей активной адаптации к украинским реалиям передового зарубежного опыта формирования транспортно-логистических кластеров