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MODERN CONCEPTS OF FORMATION AND TRANSFORMATION OF LOGISTICS NETWORKS IN THE TOURISM AND RECREATION SPHERE

СУЧАСНІ КОНЦЕПЦІЇ ФОРМУВАННЯ ТА ТРАНСФОРМАЦІЇ ЛОГІСТИЧНИХ МЕРЕЖ У СФЕРІ ТУРИЗМУ ТА РЕКРЕАЦІЇ

The introduction of martial law in Ukraine, prompted by Russia's aggression, has become a significant challenge for many sectors of the economy, including tourism and recreation. This sector, which has traditionally played an important role in generating national income, creating jobs, and strengthening the country's international image, has undergone significant transformations under the influence of military actions, economic instability, and migration processes. In the context of limited mobility, infrastructure destruction, and reduced demand for domestic and international tourism, the need to adapt logistical networks to the new realities becomes increasingly relevant. Thus, the purpose of this study is to analyze modern approaches to the formation and transformation of logistical networks in the tourism and recreation sector under martial law, identify the main challenges faced by the industry, and develop recommendations for addressing them.

Keywords: consumer priorities, crisis; logistical processes, transportation networks, routes, infrastructure, excursion service logistics.

Введення військового стану в Україні, викликане агресією РФ, стало значним викликом для багатьох секторів економіки, включаючи сферу туризму і рекреації. Цей сектор, який традиційно відіграв важливу роль у формуванні національного доходу, створенні робочих місць і зміцненні міжнародного іміджу країни, зазнав суттєвих трансформацій під впливом військових дій, економічної нестабільності та міграційних процесів. В умовах обмеженої мобільності, руйнування інфраструктури та зниження попиту на внутрішній і міжнародний туризм, актуалізується питання адаптації логістичних мереж до нових реалій. Відтак, метою дослідження є аналіз сучасних підходів до формування та трансформації логістичних мереж у сфері туризму та рекреації в умовах військового стану, визначення основних викликів, які постають перед цією сферою, а також розробка рекомендацій щодо їх подолання. У умовах військового стану в Україні сфера туризму та рекреації стикається з суттєвими труднощами, зокрема через обмежений доступ до матеріальних, фінансових та кадрових ресурсів. Ці обмеження значно ускладнюють нормальне

функціонування логістичних процесів та потребують особливих підходів до форматів їх реалізації. Зокрема логістичні мережі у сфері туризму та рекреації повинні охоплювати широкий спектр процесів і елементів, що забезпечують безперервне надання туристичних послуг. Це включає не лише транспортування та постачання, а й зберігання та розподіл ресурсів, а також надання послуг, необхідних для безпечного й комфортного перебування туристів. Серед основних компонентів логістичних мереж у туризмі та рекреації виділяються транспортні мережі, інфраструктура готелів та ресторанів, маршрутна інфраструктура курортів та рекреаційних зон, а також інформаційні технології та комунікації, що забезпечують ефективне управління потоками туристів і ресурсів. Всі ці елементи повинні бути налаштовані таким чином, щоб адаптуватися до викликів, пов'язаних із військовим станом та кризовими умовами. Враховуючи наявні проблеми з доступом до ресурсів і пошкодження інфраструктури, особливо в зоні конфлікту, є критично важливим розвиток гнучких і адаптивних логістичних мереж. Це дозволить не тільки зберегти функціональність туристичної галузі, але й сприятиме її відновленню в повоєнний період.

Ключові слова: пріоритетів споживачів, криза, логістичні процеси, транспортні мережі, маршрути, інфраструктура, логістика екскурсійного обслуговування.

Statement of the problem. The introduction of martial law in Ukraine, triggered by russia's aggression, has posed a significant challenge to many sectors of the economy, including tourism and recreation. This sector, which has traditionally played an important role in generating national income, creating jobs, and strengthening the country's international image, has undergone significant transformations due to military actions, economic instability, and migration processes. In the context of limited mobility, infrastructure destruction, and reduced demand for domestic and international tourism, the issue of adapting logistical networks to the new realities has become increasingly urgent.

Modern concepts of forming and transforming logistical networks in the tourism and recreation sector must consider changes in consumer priorities, the need to optimize routes, the development of safe tourism products, and the implementation of innovative solutions. In particular, the development of domestic tourism becomes especially important, as it not only supports economic activity in the regions but also contributes to the psychological recovery of the population. At the same time, there is an increasing need to utilize digital technologies, such as Geographic Information Systems (GIS), online booking platforms, and virtual tours, which allow maintaining contact with consumers even in crisis conditions.

Analysis of recent research and publications. A significant number of scientific studies are devoted to the theoretical and practical aspects of analyzing modern approaches to the formation of logistical networks in the tourism and recreation sector. Thus, P.V. Krush, Y.V. Mehed, and T. Marusei [1; 2] have thoroughly analyzed a range of functions carried out within the framework of logistics activities by tourism enterprises and hospitality businesses. They focus on the importance of efficient management of transportation flows, and resources, as well as the optimization of supply and customer service processes. L.P. Serednytska and V.V. Volynets [4] investigated the component structure of tourism logistics, highlighting key elements such as route planning, resource supply, and infrastructure management to ensure the effective functioning of the tourism and recreation industry.

In addition, V.H. Shchabelska, Y.Y. Polohovska, and M.D. Bykova focuses on certain aspects of logistics optimization in crisis conditions, particularly during economic instability [6]. They emphasize the need for adapting logistical networks to changing conditions and

the necessity of quick responses to new challenges faced by enterprises in times of uncertainty.

At the same time, the issue of applying specific approaches to the formation and transformation of logistical networks in the tourism and recreation sector under martial law, unfortunately, remains insufficiently studied. The peculiarities and challenges during crises and military conflicts require more in-depth investigation. It is necessary to take into account the specifics of security, infrastructure adaptation, management of people and goods flows, and the rapid transformation of logistics chains in conditions of limited access to resources and damaged infrastructure. Thus, research in this area holds significant scientific and practical value.

Formulation of the research task. The study's purpose is to analyze modern approaches to the formation and transformation of logistical networks in the tourism and recreation sector under martial law, identify the main challenges facing the industry, and develop recommendations for addressing them

Summary of the main research material. Within the framework of the study, the main focus is on modern concepts of the formation and transformation of logistical networks in the tourism and recreation sector, interpreted as a set of scientific approaches aimed at optimizing the functioning and adapting logistical systems in the tourism and recreation sector to current conditions.

Classically, these concepts take into account the dynamic changes in global and local conditions, particularly the impact of crisis phenomena and the associated economic fluctuations, which significantly alter demand, resource flows, and consumer behavior. Therefore, in the context of martial law, such concepts gain particular importance, as they allow for the adaptation of logistical networks to conditions characterized by a high level of instability, limited access to resources, infrastructure destruction, and the need for rapid responses to security challenges [4].

Indeed, under martial law in Ukraine, the tourism and recreation sector faces significant challenges related to limited access to various resources – material, financial, and human [3]. A portion of the workers in the tourism sector have been forced to migrate to other regions or countries, or are participating in the defense of the country, leading to a shortage of skilled personnel. The reduction in tourist flow, especially international tourism, has led to a significant decline in revenue that could have been used to support or develop logistical infrastructure. Interruptions in the supply of electricity, fuel, and heat affect the

operation of tourist facilities and create additional risks for the uninterrupted functioning of logistical networks. The shortage of transportation due to its mobilization for military needs or damage caused by combat actions reduces the efficiency of logistical operations.

Under martial law in Ukraine, the tourism and recreation sector faces problems such as the destruction or damage of tourist facilities, transportation routes, hotel complexes, and recreational areas, which significantly limits the ability to provide services. This complicates both the movement of tourists and the delivery of necessary materials, equipment, and supplies.

For example, the bridge over the Irpin River near Kyiv was destroyed during the fighting, disrupting transportation connections to tourist sites in the region. Some hotels in the Kyiv region were either occupied or damaged, which reduced the capacity for accommodating tourists in this area. In particular, on December 31, 2022, a missile hit the "Alfavito" hotel in the center of Kyiv. These examples demonstrate the scale of the destruction and the challenges faced by the tourism and recreation sector in Ukraine.

It is important to emphasize that logistical networks in the tourism and recreation sector encompass a wide range of interconnected processes and elements designed to ensure the uninterrupted functioning of tourism services. This includes organizing transportation, supply, storage, and distribution of resources, as well as providing services necessary for the comfortable and safe stay of tourists. The core elements of such networks include: transportation networks, hotel and restaurant infrastructure; route infrastructure of resorts and recreational areas; information technologies and communications; establishments for the supply of goods and services, and more (Figure 1).

In particular, logistical networks in the tourism and recreation sector should encompass a wide range of processes and elements that ensure the uninterrupted delivery of tourism services. This includes not only transportation and supply, but also the storage and distribution of resources, as well as the provision of services necessary for the safe and comfortable stay of tourists [3; 6]. In the context of martial law, the key aspects of ensuring the safe and comfortable stay of tourists are:

- 1) restructuring of routes and infrastructure;
- 2) innovative approaches to risk management;
- 3) focus on the humanitarian component;
- 4) development of domestic tourism.

Indeed, restructuring routes and infrastructure involved in the tourism and recreation sector should

focus on adapting existing tourist and recreational paths, facilities, and logistical networks to new conditions caused by external factors such as military actions, economic instability, or natural disasters. This process aims to preserve and restore the functionality of the tourism sector, ensure the safety of tourists, optimize resource use, and develop new directions. The core elements of restructuring routes and infrastructure should include [5]:

- Changing tourist routes, specifically: developing alternative paths that bypass dangerous or destroyed areas; focusing on safe regions that remain intact to create new tourism offers; shifting routes within domestic tourism (for example, from frontline areas to central or western regions of Ukraine).

- Temporary adaptation of infrastructure, which may include: the use of mobile or temporary structures (such as camping sites or mobile hotels); creating temporary transport routes to connect major tourist points; implementing temporary service facilities, such as mobile cafes or maintenance stations.

- Restoration of damaged infrastructure, which may include: repair or reconstruction of damaged roads, bridges, railway stations, and airports; reconstruction of destroyed tourist facilities (such as museums, hotels, beach areas, and nature parks [4]); development of new communication networks to ensure connectivity with safe tourist destinations.

- The development of new tourist destinations, including the creation of new routes focused on regions that have become popular due to changes in demand or migration processes; opening new eco-tourism, historical, or cultural sites that have not been affected by the war.

- The implementation of innovative solutions, which may include: the use of digital technologies for route planning, such as GIS and tourist apps; introducing virtual tours to promote safe tourist areas; remote ticket sales and service bookings, taking into account adapted routes.

- Arranging rest areas and stops with appropriate safety measures, including shelters and medical stations.

The importance of these measures cannot be overstated, as they involve adapting existing routes and infrastructure to new realities, while also positively influencing the perception of the domestic tourism sector by tourists and investors/

Innovative approaches to risk management involve identifying, analyzing, and minimizing the impact of potential threats, such as military actions, economic crises, or natural disasters, on the effectiveness and resilience of

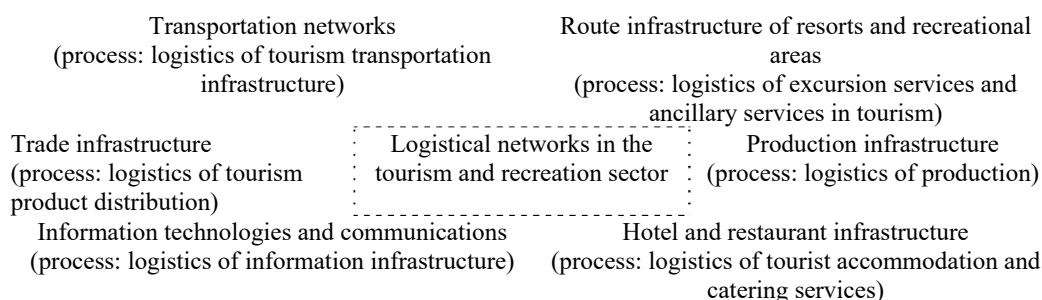


Figure 1. Processes and elements that form logistical networks in the tourism and recreation sector

Source: formed based on [1–2]

logistical processes. These innovative approaches help adapt to modern challenges, ensuring the uninterrupted functioning of the industry. The main innovative approaches to risk management in the logistics networks of the tourism and recreation sector may include [23]:

- The use of Big Data for predicting risks (such as traffic jams, weather conditions, or the threat of military actions [4]) and crisis management (through the development of crisis protocols, such as Business Continuity Planning and early warning systems [5–6]).

- The use of mobile applications integrated with GIS and IoT for monitoring the condition of logistics networks and ensuring their operational efficiency.

- The use of blockchain technology to ensure transparency in supply chains (specifically tracking all logistics stages in real time [6]) and automate transactions between tour operators, suppliers, and clients.

The implementation of innovative risk management measures is a key factor in the success of preserving and developing the tourism industry in times of crisis and instability. For example, during martial law, many tour operators and travel clubs implemented mobile applications that provide real-time information to their staff and clients about safe routes, the situation in tourist areas, and the ability to quickly adjust plans through notifications about threats (such as shelling, checkpoints, or changes in road accessibility [6]). Mobile platforms of certain tour operators in Lviv, such as the "inCruises" travel club and the "Travel Club 'Mandrovnyk'," also provide information about available services, medical points, and volunteer initiatives. This allows tourists to adjust their plans with minimal safety risks.

The approach that involves integrating humanitarian logistics into the networks of the tourism and recreation sector to support internally displaced persons (IDPs) and stimulate the socio-economic development of affected regions. The core elements of integrating humanitarian logistics may include the following [5]:

- Transitioning infrastructure into an adaptable mode, which involves: the ability to use tourist facilities (such as hotels, resorts, or recreational centers) for the accommodation of internally displaced persons (IDPs); converting tourist areas into centers for humanitarian aid and rehabilitation (which can provide basic needs such as housing, food, medical care, and psychological recovery [1–2]).

- Transitioning the logistics networks of the tourism and recreation sector into a multifunctional mode, which involves: using tourist logistics routes for transporting humanitarian aid (including food, medicines, and essential goods [2]); transforming networks into evacuation routes (as recreational or tourist facilities have the necessary transportation infrastructure [6]).

It should be noted that the integration of humanitarian logistics into the networks of the tourism and recreation sector ensures the effective use of tourism infrastructure in crisis conditions. For example, with the onset of the full-scale war in Ukraine, many people from regions affected by hostilities (Donetsk, Luhansk, Kharkiv regions) were forced to evacuate to relatively safe areas. At the same time, tourist facilities in western Ukraine, particularly the Carpathians and their logistical networks, became one of the main destinations for internally displaced persons

(IDPs). For instance, the village of Polyanytsia (Ivano-Frankivsk region), recreation centers in Vorokhta, and sanatoriums in Truskavets and Morshyn (Lviv region) provided housing for displaced persons and organized free excursions to support their emotional well-being.

The approach aimed at developing domestic tourism during martial law includes measures focused on supporting and stimulating tourism activities within the country during crisis situations. This not only helps preserve economic activity in the tourism sector, but also ensures social support, reduces the burden on infrastructure, and creates opportunities for the recovery of local economies in safe regions. Core aspects of this approach include [1; 6]:

- Reorientation towards safe domestic tourist destinations. This may involve the development of tourism in less affected regions, such as the Carpathians, Lviv region, and Bukovina, where the infrastructure has not been destroyed and has natural or cultural resources to attract tourists.

- The development of domestic tourism contributes to supporting small and medium-sized businesses. In particular, tourism enterprises (hotels, restaurants, guides, transport companies [2]) in times of war should receive subsidies or other forms of assistance from the government or charitable organizations to preserve jobs and stimulate domestic demand. For example, support programs for farms, eco-estates, or small hotels that can offer authentic cultural and gastronomic tours for Ukrainians are relevant, helping to restore the local economy.

- The organization of special events and services for domestic tourists includes additional safety measures, medical points, crisis communication, and psychological support for people affected by the war. Engaging tourists in recreational resorts helps restore the emotional well-being of citizens, allowing them to relax and psychologically recover.

- The integration of cultural and historical routes through thematic tours, festivals, exhibitions, and cultural events aimed at increasing interest in domestic tourism and preserving cultural heritage in times of crisis.

The approach to the development of domestic tourism in the conditions of martial law should be comprehensive and multifaceted. It includes the use of safe routes, support for local enterprises, the creation of comfortable conditions for recreation and recreation, the development of cultural initiatives, as well as the provision of flexibility and safety for tourists. Such measures help to preserve and develop the tourism industry even in the most difficult times, providing economic stability and psychological support to citizens.

Conclusions. Under the conditions of martial law in Ukraine, the sphere of tourism and recreation faces significant difficulties, in particular, due to limited access to material, financial, and human resources. These limitations significantly complicate the normal functioning of logistics processes and require special approaches to their implementation formats.

In particular, logistics networks in tourism and recreation should cover a wide range of processes and elements that ensure the seamless provision of tourism services. This includes transportation and supply, the storage and distribution of resources, as well as the

provision of services necessary for the safe and comfortable stay of tourists.

Among the key components of logistics networks in tourism and recreation are transportation networks, hotel, and restaurant infrastructure, route infrastructure of resorts and recreational areas, as well as information technologies and communications that ensure effective management of tourist flows and resources. All these elements must

be configured in such a way as to adapt to the challenges associated with martial law and crisis conditions.

Given the existing issues with resource access and infrastructure damage, especially in conflict zones, the development of flexible and adaptive logistics networks is critically important. This will not only help maintain the functioning of the tourism industry but also contribute to its recovery in the post-crisis period.

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