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The potential of logistics centers in the logistics security system in the Middle-East Europe is emphasized by the example of the Polish armed forces within the national security system of the Republic of Poland

Introduction

As communities have transformed, so have the challenges of logistics. Modern armies must be able to operate effectively and efficiently in virtually the entire world. With the accession of Poland to the ranks of NATO, new challenges have arisen, and the Polish army must be able to move forces and means to fight in the shortest time possible, often over very long distances. Participation in international field training and peacekeeping and stabilisation missions requires continuous development not only in combat operations but mostly in transporting materials.

Currently, a very good example that illustrates the importance of long-distance transport capabilities is the war in Ukraine. Ukraine was forced to face Russia in the armed struggle and received extensive support from almost the entire world. We are witnessing how weapons donated by the US and other countries could be delivered to the front line within several days and increase the possibilities of conducting defensive operations.

Currently, the roles have been reversed, and it is military logisticians who repeatedly use the patterns applied in the dynamically developing civilian market. One of the examples of the use of civilian logistics in the Armed Forces is activities aimed at transforming the logistics potential by concentrating it into:

1. Economy Branches of Military Units (WOG).

2. Regional Logistic Bases (RBlog).

What are the possibilities of using logistics centres in the military territorial logistics security system? At the outset, we should ask, what is a logistics centre? It is a highly specialised organisational and functional structure of an economic entity, which operates in a specific area, associating entities performing specific roles in the supply chain, and its infrastructure allows for a free performance of all activities related to:

- transport;
- storage;
- distribution of goods – in the domestic and international systems.

These activities are carried out by various operators on a commercial and free-competition basis.

A logistics centre shall be equipped with all the necessary devices for the operations in question. In order to encourage intermodal transport for handling goods, it should be served by many modes of transport (road, rail, maritime, inland waterway and air) and should be located close to the most important communication arteries¹⁰².

The essence of a logistics centre is to create an organisation that would meet customers' requirements with its activity, i.e., the variety of logistics and other accompanying services.

Logistics Centres in Poland

Currently, the following logistics centres operate in Poland:

1. Silesian Logistics Centre JSC with its registered office in Gliwice.
2. The limited liability company "Euroterminal" with its registered office in Sławków.
3. Centre for Logistic and Industry Investments Poznań II (CLIP) Ltd. with its registered office in Swarzędz – Jasin.
4. Logistics Centre Ltd. with its registered office in Łosośna.
5. Greater-Poland Logistics Centre Konin Old City JSC with its registered office in Konin.

The creation of logistics centres is the result of the search for the cost optimisation of:

¹⁰² <https://wozkirown.pl/blog/centrum-logistyczne-definicja-funkcje-rodzaje>

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- transport;
 - distribution;
 - storage;
 - consolidation of transshipment;
 - secondary and ancillary services for better and, therefore, faster and efficient customer service.

For this purpose, the following means are used:

- developed IT systems;
- efficient management;
- the specific radius of influence – international.

Logistics centres are often identified with the name of logistics platforms or hubs that act as a central warehouse, where goods are collected and distributed to respective places. Moreover, they are a fundamental element of the logistics chain.

Procedures for Implementing the Research Process

Ekspansywna The goal that the authors want to achieve is to propose the possibility of using logistics centres in the logistics security system of the Polish Armed Forces, which will facilitate making management decisions in conditions of various types of threats.

The research problem is the following question: How to use the potential of logistics centres, which will effectively support supplying general-purpose means and road transport of the Polish Armed Forces within the national security system of the Republic of Poland?

The research hypothesis was assumed: The proposal to use the potential of logistics centres will effectively support supplying the Polish Armed Forces with general-purpose means and road transport.

The research subject was to develop a proposal for using the potential of logistics centres in the logistics security system of the Polish Armed Forces.

The analysed subject was the Polish Armed Forces' logistics security system.

The spatial scope of the research includes already functioning logistics centres and the Polish Armed Forces.

The timeframe covers the year 2022.

In the course of the research, the following research methods were used:

- analysis of the potential of logistics centres and the logistics security system of the Armed Forces;
- synthesis of proposals strengthening the logistical security potential of the Armed Forces;
- deduction – intuitive thinking;
- statistical methods;
- algorithmic methods – creating sequences of hints enabling the solution of a research problem.

Furthermore, during the research and paper's development, there was made an analysis of literature and other information sources in the field of the potential of logistics centres increasing the possibilities of its use in the logistics security system in the Armed Forces.

Proposals to Use the Potential of Logistics Centres in the Territorial System of Logistics Security in Peacetime

Logistics centres are located throughout the country at the most important transport hubs. Practically each has access to at least two, and often even more, transportation routes. In times of peace, the ideal way to use logistics centres would be to support the Regional Logistic Bases and the Economy Branches of Military Units.

Logistics centres on the civilian market are equivalents of the Regional Logistics Bases and the Economy Branches of Military Units.

During peacekeeping operations, logistics centres could function as support for the Regional Logistic Bases and the Economy Branches of Military Units. Each logistics centre in Poland has its own transport fleet. These often are the most modern means of transport, distinguished by their capabilities compared to the military means of transport. Furthermore, logistics centres have:

- large storage areas with modern technical and technological equipment;
- staff enabling efficient functioning.

Peacetime logistics centres could be used:

- to supply military units;
- as long-term warehouses for the general-purpose means of war stocks.

The first possible option for using the potential of logistics centres is to support the Regional Logistics Bases and the Economy Branches of Military Units as distribution centres for general-purpose materials.

Logistics centres have extensive transport fleets, which makes it possible to connect the civilian networks with the Armed Forces. This procedure would reduce the costs of transporting goods to specific military organisations and units. Especially when supplying spare parts, there is a problem of transporting very small amounts of material resources. In such a situation, if logistics centres would use their fleet while transporting units (military organisations) and local entrepreneurs, it could significantly reduce fuel and delivery costs, creating a more attractive offer for civilian contractors and the Polish Armed Forces. Using logistics centres in such situations would not change the unit of financial settlement but would relieve the supplied units' commanders from the problem of sending the units' equipment for the supply that should be delivered directly to the recipient.

The storage needs of the Polish Armed Forces are enormous, and as economic operators, they have the appropriate capacity to store general-purpose means. At the moment, there are no formal and legal regulations in this area and logistics centres as business entities:

- do not have the authority and infrastructure for the storage of general-purpose or military equipment;
- thanks to their experience and appropriate infrastructure equipment, they have high usability in the material storage system of the Polish Armed Forces;
- therefore, it is rational to introduce solutions that will improve this system.

It means that materials and food are stored and remain on the shelves of the Polish Armed Forces' warehouses for a useful period (months or even years). The mentioned:

- modern infrastructure;
- experience;
- and extensive warehouse areas of logistics centres are a very good storage alternative for the Polish Armed Forces.

A possible solution in this area of proposals is to use logistics centres as warehouses for the Polish Armed Forces, which would relieve its already heavily loaded warehouses. Moreover, the desire of the Polish authorities to increase the defence potential to about 300,000.0 will be an effective solution for a possible increase in the size of stocks in warehouses already heavily loaded by material means. Transferring the materials and equipment reserves to storage and distribution by the logistics centres would be a rational solution in such a situation.

Logistics centres, combined with an extensive transport fleet and a very good location, are able to support military units throughout Poland. Signing contracts for the lease of warehouse space is a much cheaper option than the construction of new military depots, which, together with the infrastructure, will require a lot of funds, even several hundred million zlotys.

The tasks assigned to logistics centres in terms of storage for the Polish Armed Forces in peacetime are primarily:

- storage of materials and food;
- the accumulation and maintenance of war stocks;
- completing orders sent by the unit and further expeditions;
- consolidation – completing small batches of goods into one large shipping batch;
- deconsolidation – the reverse process to the above-mentioned – separating a given batch of goods into smaller ones according to the needs of recipients;
- adequate food rotation to avoid expiration;
- advising and assisting military warehouses in the aspect of storage.

With the increasing training in conjunction with allied armies, the need for efficiently organised cooperation in international logistics increases. Interoperability becomes increasingly important as logistics centres, along with the latest technical equipment, can cope with the problems of modern equipment of allied armies. Logistics centres, also with large parking and storage areas, have the ability to accumulate military equipment of allied countries before it is finally transported to its destination.

The tasks assigned to logistics centres in terms of supporting the “hosting state” in peacetime are primarily:

- support for the Polish Armed Forces with experience in the international arena;
- reloading the military equipment of allied countries;
- storage of allied equipment before transport to the destination.

The means of transport in the logistics centres exceed the means of transport of the Polish Armed Forces several times in terms of quantity and quality. Thanks to this cooperation, the Armed Forces will be able to use a widely developed transport infrastructure, which in various situations, will be able to efficiently deliver stored materials. Thanks to the extensive transport fleet, logistics centres have the ability to move more material resources, which will translate into shorter waiting time for deliveries. Furthermore, such solutions will relieve the already heavily loaded means of transport of the Polish Armed Forces and consequently will allow for focusing on transporting munitions that will be stored in warehouses and depots of the Armed

Forces' potential. It is also worth paying attention to the possibility of financial savings, which the Polish Armed Forces will gain thanks to the transfer of part of the transport to the care of logistics centres. With this solution, the logistics centres themselves will not incur high costs due to the possibility of combining transport with their courses. It should also be expected that the experience gained in such cooperation between both parties will develop the skills and the possible direction for developing the Polish Armed Forces' transport capabilities.

The tasks assigned to logistics centres in the aspect of transport of goods for the Polish Armed Forces in peacetime are primarily:

- storage of general-purpose means for the needs of the Armed Forces, mainly meeting the needs of the military and other units;
- supplying general-purpose means and supplies from the warehouses of logistics centres to a selected military unit;
- movement of material resources from units to logistics centres;
- supporting military units in intermodal transport by making means of transport available;
- advice and assistance in the aspect of oversized cargo transport.

Moreover, peacetime logistics centres could be used virtually unrestricted to store the necessary quantities of material resources under the required physical-chemical and safety conditions. Large and modern warehouse areas of high-capacity logistics centres equipped with the latest technologies and technical equipment would streamline the process of storing general-purpose equipment for the Armed Forces.

Based on the conducted analyses, the authors of this article proposed to use the potential of logistics centres in Poland mainly by Regional Logistic Bases, so they could support¹⁰³:

1 Regional Logistic Base in Wałecz – Centre for Logistic and Industry Investments Poznań Ltd. based in Swarzędz. The centre has the largest loading capacity and modern parking spaces, which could secure operations by the hosting state.

2 Regional Logistic Base in Warsaw – Greater-Poland Logistics Centre Konin Old City JSC with its registered office in Konin. Several military units are located in Warmia and Mazury, so using this logistics centre could significantly shorten the distances.

¹⁰³ S. Bartosiewicz & M. Oziębło, Koncepcja wykorzystania centrów logistycznych w wojskowym terytorialnym systemie zabezpieczenia logistycznego. *Gospodarka Materiałowa&Logistyka*, 5/2019.

3 Regional Logistics Base in Kraków – logistics centre located in Silesia near Dąbrowa Górnicza. Kraków is located relatively far from the units located in the protected area. The optimal solution would be to use the logistics potential presented by the company “Euroterminal” Ltd. with its registered office in Sławków. It allows for significantly shortening the distance between the target units and the source of goods distribution.

4 Regional Logistic Base in Wrocław – Silesian Logistics Centre JSC with its registered office in Gliwice. It should be noted that the logistics centre in Gliwice is one of the best-equipped centres in Poland, with extensive storage capacity, intermodal transport, and cargo transshipment.

One of the most important arguments for using the potential of civilian logistics centres is mutual benefits for logistics centres and the Polish Armed Forces. First of all, logistics centre operators may have a problem with finding such a good contractor as the Polish Armed Forces. The contracts, the authenticity of which is guaranteed by the State Treasury, are the most reliable for cooperation. Besides, these contracts are long-term, and keeping the transport fleet ready to provide the necessary needs in any crisis is just another profit for logistics centres. It should be noted that it is up to the military to gain experience based on the operation of logistics centres and the distribution of investment costs. It will significantly expand the transport fleet and the possibilities of distributing loads of specific material batches without the necessity to purchase new means of road transport.

As the Polish Armed Forces conduct increasingly more exercises with the armies of other countries, the need for more efficient international logistical cooperation in this area is growing. It indicates additional possibilities for using logistics centres by elements of the territorial logistics security system. The hosting country should be responsible for transport and service needs. Additionally, the equipment used on training grounds is often transported in batches, and in this case, logistics centres’ parking lots and warehouses can serve as storage locations before the equipment is finally transported to its destination. Petrol stations and technical workshops are often located near logistics centres and can also be used for technical servicing of military equipment, providing additional income for civilian institutions.

It seems logical that the scope of operation of these logistics centres should be somehow limited in favour of combat units of the Armed Forces. Even high-capacity warehouses are not designed for the safe storage of materials or intended for another assortment. Therefore, until now, logistics centres, as civilian entities, could not be used for this type of cooperation, but they can be used in virtually unlimited ways to store large quantities of assets without posing a threat during storage. Moreover, the retention of military reserves is subject to regulatory restrictions.

Most warehouses of the Armed Forces must meet high standards set by formal and legal regulations for munitions, fuel, and others. Therefore, in the case of using civilian logistics centres to store uniforms, spare parts, or food supplies, the standards would be much easier to meet. Furthermore, if appropriate agreements are signed, the adaptation of warehouses could be dealt with by the Armed Forces.

On the other hand, it is an opportunity for the Armed Forces to gain experience based on the functioning of logistics centres and spreading the costs of building new warehouse facilities over the years. It also significantly expands the transport fleet, and the ability to deliver specific material needs to the Armed Forces units without purchasing new vehicles.

Possible Directions for Improving the Use of the Logistics Centres' Potential in the Logistics Security System

In case of war, Poland would transform its stationary logistics potential into mobile logistics units, making logistics centres an ideal support link.

Therefore, it is necessary to act as transport and material support for newly formed units in case of the threat of various types of conflicts. In case of an armed conflict, the main effort to ensure effective protection of combat units would be taken over by two Logistic Brigades located in:

1. Bydgoszcz,
2. Opole.
3. Their task would be to take over the burden of securing combat units in combat operations, and the use of the transport potential of logistics centres could significantly improve and relieve the military system.

In case of war, the main tasks of the Regional Logistic Bases and the Economy Branches of Military Units, in addition to providing the necessary materials to distant units, there would also be to distribute the necessary materials to units mobilised during the war. Due to the diversity of equipment of protected units, their compositions are also variable, which is presented in Tables 1 and 2. This solution allows for optimising the possibilities of goods distribution.

Table 1. A variant of equipping a supply subunit with car vehicles of different capacities on the example of a logistics battalion in the Armoured Cavalry Brigade

Type of transport vehicle	Number of car vehicles
Medium-payload and high-mobility vehicle	57
General-purpose general-purpose vehicle	3

Medium-payload general-purpose vehicle	27
Low-payload general-purpose vehicle	3
High-mobility truck-passenger vehicle	2

Source: own elaboration based on Kurasiński¹⁰⁴.

Table 2. An example variant of the number of means of transport in the subunit (company) of the supply of the logistics battalion and the logistics centre

Organisation	Minimum number of car vehicles	Maximum number of car vehicles
Supply company	70	100
Logistic centre	50	300

Source: own elaboration based on Kurasiński¹⁰⁵.

A supply company consists of 70÷100 vehicles, and logistics centres have fleets of 50÷300 vehicles, not including contracts signed with carriers (Figure 1). As presented in the data, logistics centres can strengthen the road transport fleet in case of various types of threats:

- from one supply company;
- to more than three supply companies.

The result is that in the context of the main transport potential of the logistics security system of the Armed Forces during various types of operations, such a solution will significantly increase their capabilities. Figure 1 shows the number of car vehicles in the supply unit of the logistics battalion and the logistics centre.

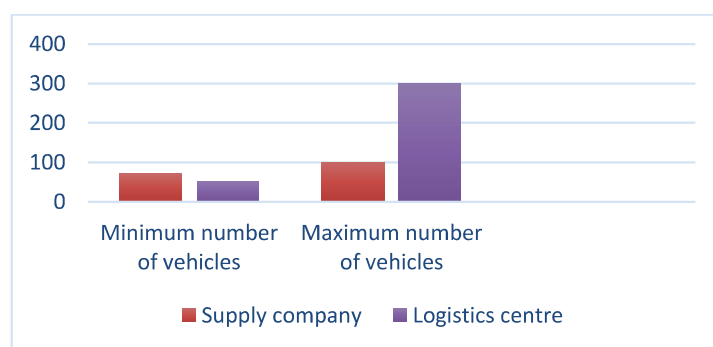


Figure 1. Comparative analysis of the number of car vehicles in the supply subunit of the logistics battalion and the logistics centre

¹⁰⁴ Z. Kurasiński, *Kompendium logistyka wojskowego*. SG WP, P4, 2014, p. 107.

¹⁰⁵ Ibidem.

Source: own elaboration.

To sum up, based on the conducted analyses, the authors proposed:

4. The use of logistics centres as places to collect and store general-purpose materials for the needs of the Armed Forces' subunits.
5. Logistic Brigades could collect and deliver material from military warehouses.
6. On the other hand, logistic centres could simultaneously distribute and deliver material stocks to newly formed subdivisions.
7. As a consequence of such solutions, the "Logistic Brigades" could efficiently deliver combat assets to combat units in need.

Especially important in the early stages of combat operations is the rapid decentralisation of reserves, making it difficult for the enemy to destroy them. In the case of combat operations, efficient loading and unloading equipment on intermodal means of transport is important. It suggests another possibility of using logistics centres as territorial elements of the logistics security system of the Armed Forces. It should also be noted that the transshipment capacity of logistics centres is incomparably greater than in logistics subdivisions, so it is worth considering the proposed solutions in terms of their use in practice, both by the Polish Armed Forces and logistics centres.

Summary and Conclusions

Logistics centres perform many functions related to broadly understood logistics, i.e., comprehensive service for various entities, such as forwarders or carriers. The scope of activities of logistics centres also includes auxiliary and additional functions, such as:

- shipping and freight forwarding;
- custom service;
- IT services related to logistics management;
- insurance;
- rental of pallets and containers;
- promotion and marketing.

Of course, thriving logistics centres cannot operate without additional activities. Most often, these will be technical and formal issues in the field of:

- vehicle maintenance;

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- repair of packaging and containers;
 - disposal of pollutants and garbage;
 - banking;
 - parking services;
 - hotel services;
 - catering;
 - telecommunication services.

Gaining such benefits within one company could be extremely expensive or even impossible – hence the increasing number of companies decide to tie their activities with the comprehensive offer of a logistics centre.

Logistics centres have a developed transport potential that exceeds the potential of the Economy Branches of Military Units, which argues for using logistics centres as elements of the Armed Forces system's distribution network to improve the supply chain's functioning in peace and war.

Logistics centres have a large potential for warehouse space, and their capabilities increase every year. Therefore, it would be useful to include them in the system of storing war stocks. Renting warehouse space is much cheaper than building modern high-capacity warehouses. Moreover, the logistics centres have extensive experience, trained staff and are equipped with modern technologies and technical equipment to handle purchasing, storing, distributing, and making available mainly high-load road transport. In a situation where the Polish Armed Forces are expanding to a number of about 300,000.0, it is reasonable to take advantage of these proposals as they increase the implementation capabilities in the field of logistical security.

Streszczenie

Przedmiotem badań przedstawionych w artykule jest ocena funkcjonalności systemu bezpieczeństwa logistycznego Sił Zbrojnych RP w ramach systemu bezpieczeństwa narodowego RP. Ściślej wskazując, problematyka badawcza dotyczyła możliwości wynikających z wykorzystania centrów logistycznych w tym systemie, a tym samym wpływu ich funkcjonowania na cały system bezpieczeństwa logistycznego wojska w ramach polskiego systemu bezpieczeństwa narodowego. Omawiane zagadnienia są istotne ze względu na fundamentalne znaczenie sprawnie funkcjonującego zaplecza logistycznego dla możliwości efektywnego działania całych sił zbrojnych jako podstawowego elementu systemu bezpieczeństwa narodowego każdego państwa. W związku z powyższym sformułowano

następujący problem badawczy: jak wykorzystać potencjał centrów logistycznych do efektywnego wsparcia zaopatrzenia i transportu drogowego Sił Zbrojnych RP w systemie bezpieczeństwa narodowego RP? Aby odpowiedzieć na to pytanie, posłużono się metodą przeglądu literatury, gromadząc dane empiryczne, które następnie poddano obróbce metodami analitycznymi, syntezowymi, statystycznymi i algorytmicznymi. Ostatecznie odpowiedź na postawione pytanie badawcze została sformułowana w oparciu o metodę wnioskowania (technika wnioskowania dedukcyjnego).

Słowa kluczowe:

Ssystem bezpieczeństwa logistycznego, siły zbrojne, centra logistyczne,
narodowy system bezpieczeństwa

Key words:

Logistics security system, Armed Forces, logistics centres, national security system

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