

## DEVELOPMENT AND LOCATION OF LOGISTICS CENTRES: A SYSTEMATIC REVIEW OF LITERATURE

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**Abstract.** Logistics centre location is very important in the overall development of the total logistics chain. Nowadays, it is very important to find a right place for one's business. It is more important to find the best place for warehouse, to decrease all possible costs, to think about possibility to grow. Many companies are choosing to rent a warehouse because they do not know, if they have considerable expenses at the beginning of business. Question that worries many managers is how to decide about the best place where to rent or build a warehouse. This question should be number one in the development of warehouse infrastructure. Many authors think that the best place is the one, where it is possible to decrease all costs – transportation, land / rent costs. Warehouse is one of the most important links between production and delivery of goods to the customer's location. The aim of the present research is to identify factors using a systematic literature analysis method – literature overview, which is important for searching the best place for logistics centre. Literature overview is an easy tool for selecting, systematising and collecting data about the research subject, using different authors' articles, which have already proven key information about the present article. More than 8000 scientific articles were used to define 20 full-text articles for a deeper analysis. As a result of the research, the authors consider that the most important activities are to set a warehouse near important transportation nodes, and it is very necessary to decrease environmental issues.

**Keywords:** *Development; Logistics; Sustainability; Warehouse location selection*

**JEL Classification:** O18

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### INTRODUCTION

Location of the logistics centre is a long-term decision and many factors influence it. Finding the best place for it is one of the most important jobs of logistics managers. It can help every enterprise develop its logistics centre. There are different types of logistics centres – components, finished goods, production warehouses etc. If it is a warehouse, which stores only finished goods, it is necessary that clients are based around the warehouse so there cannot be shortage of these products and all products can be delivered in time also when there is a high demand. Thus, storage of products needs to guarantee the quantities demanded in the shortest possible time.

Hamidi, Gholamian, Shahanaghi and Yavari (2017) argue that warehouses can be involved in any of the following roles in a distribution network:

- They can be used as a balance and storage point because of the difference between the time scheduling and manufacturing demand. For this reason, the warehouses are usually located at the manufacturing point. Warehouses whose role is limited to this part can have monthly and seasonal demands until progressing to the next step in distribution;
- They can be utilised for storing and commixing outputs coming from different manufacturing points in one company or more, before being sent to the customers. This part usually responses to the weekly or monthly orders;
- They can be dispersed to reach the shortest transportation distances to be able to quickly respond to the customer's demand. Items are often chosen individually and similar items can be sent daily.

By contrast, Demirel N.C., Demirel T. and Kahraman (2010) state that warehouse location decisions are among the most critical decisions of distribution network design. The selection of a warehouse location among alternative locations is a multi-criteria decision-making problem, including both quantitative and qualitative criteria. The conventional approaches to warehouse location selection problem tend to be less effective in dealing with the imprecise or vague nature of the linguistic assessment. Under many situations, the values of the qualitative criteria are often imprecisely defined for the decision-makers.

The object of the present research is logistics centres and subject of the research is development of logistics centres and defining the best place of a warehouse. The aim of the research is to define factors that influence decisions of choosing the place for logistics centre.

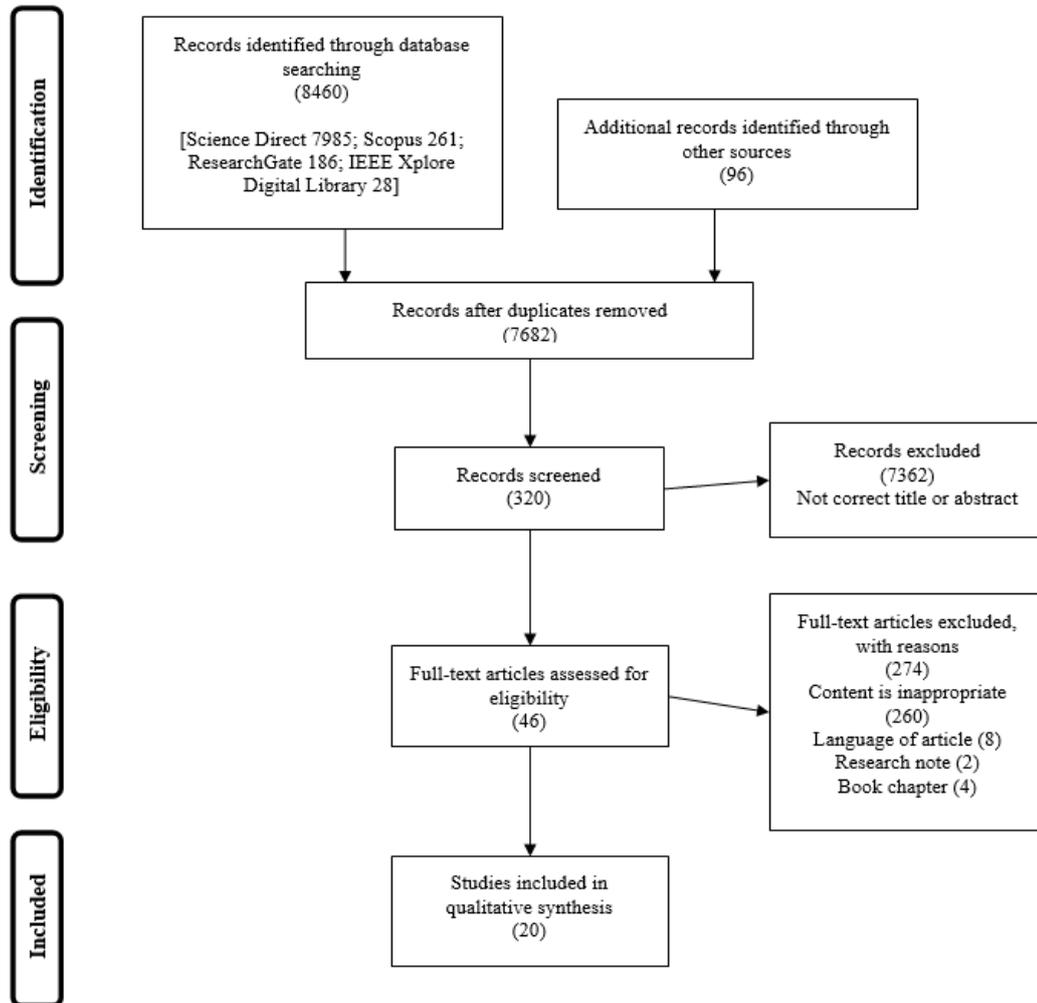
## **1. MATERIALS AND METHODS**

Within the research, the authors used a systematic literature analysis method – literature overview. Using literature overview, the authors checked more than 8000 scientific articles. After that 20 (twenty) articles were used for a deeper analysis through the method PRISMA Flow Diagram. All scientific articles were selected from databases: Science Direct, Scopus, ResearchGate and IEEE Xplore Digital Library. To analyse all the data, a tabular method was used and all factors were displayed.

A systematic review of the literature in a specific field is important. The aim of systematic review of literature is to identify research questions and describe possible areas of future research. Figure 1 demonstrates four steps of the literature analysis process – identification of literature, screening all the literature, defining literature for analysis and final results. During the research, the authors formulated a scientific question: What factors influence the decision on the location of logistics centres?

The next step is to identify appropriate literature according to the research question. Defining keywords is more than just important. In the article, these keywords were defined: development, logistics centre, sustainability, and location.

During the research, different databases were used: Science Direct, Scopus and others. The PRISMA flow diagram (Fig. 1) helps illustrates literature overview (PRISMA flow diagram, 2018).



**Fig. 1.** PRISMA flow diagram for literature search (made by the authors).

## 2. RESULTS AND DISCUSSION

The PRISMA flow diagram helped identify 20 literature resources, which the authors used for the literature analysis. Every paper provided different insight into the situation and allowed evaluating all factors, which were defined during the literature analysis.

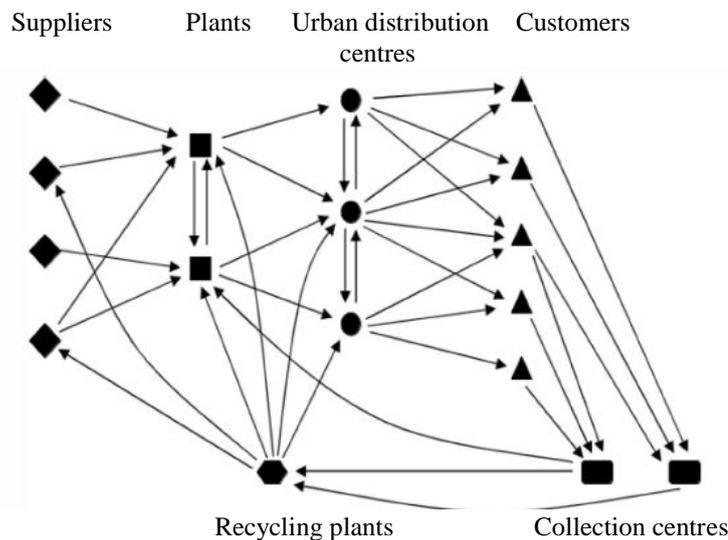
It is very important to understand that now it is very popular to live in cities rather than in the suburbs. That is why companies are also interested in situating logistics centres in the cities or near them. Now city logistics has become a popular concept. What in reality is city logistics? Taniguchi (2014) defines city logistics as “*the process for totally optimizing the logistics and transport activities by private*

companies with support of advanced information systems in urban areas considering the traffic environment, the traffic congestion, the traffic safety and the energy savings within the framework of a market economy". It is obvious that this definition shows more optimisation of private companies than local optimisation. Taniguchi (2014) also distinguishes four major stakeholders, i.e., shippers, freight carriers, administrators, and residents who are involved in city logistics.

Apart from the location of logistics centres, environmental issues are of high importance. Sopha *et al.* (2018) maintain that the growth of transport activity has impacted negatively city residents and environment in terms of traffic congestion, air and noise pollution, as well as road damage.

Agrebi *et al.* (2015) have define six most important points and reasons of urban logistics:

- It is fundamental to sustain our existing life style;
- The role it plays in servicing and retaining industrial and trading activities, which are essential major, wealth generating activities;
- The contribution that an efficient freight sector makes to the competitiveness of industry in the region concerned;
- The effect of freight transport and logistics costs on the cost of commodities consumed in the region;
- The total cost of freight transport and logistics is significant and has a direct bearing on the efficiency of the economy;
- The environmental effect of urban freight movements (in terms of energy use and environmental impacts such as pollution, noise, visual intrusion, etc.).



**Fig. 2.** A generic supply chain network (Agrebi *et al.*, 2015).

Agrebi *et al.* (2015) also show that the functioning of a city means an important rate of trade in goods. This need for service relies on physical facilities, like plants, distribution centres, collection centres, etc., as shown in t Fig. 2. These facilities are

the real drivers of the urban logistics system. Therefore, the location selection of these facilities strongly attracted attention as a major problem of urban logistics.

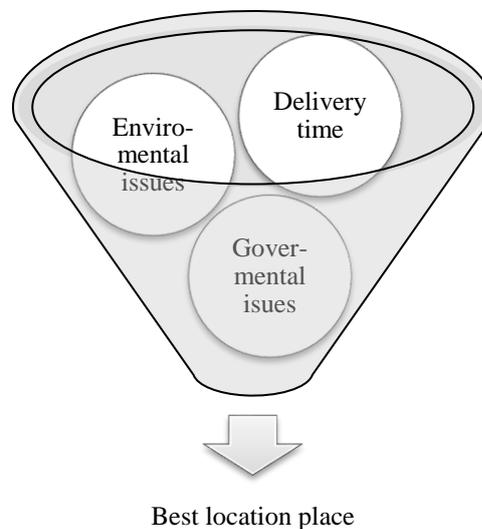
From these points one can see that there are many location points, which are important to deciding where to build a logistics centre.

Pokrovskaya (2018) insists that terminalistics is logistics of terminal networks and terminal and warehousing infrastructure. Terminalistics can be considered a methodology for comprehensive assessment of the parameters of the terminal and warehousing infrastructure. The integrated nature of the assessment consists in solving the problems of determining the number and dislocations of the terminal network nodes, their composition, their stages of development and functions, taking into consideration the flow processes of transportation, technological and economic origin and the associated multiplicative effect.

Before deciding on the right place, logistics managers need to think about the entire infrastructure around the logistics centre.

During the study, the authors use a systematic literature review. This kind of review has allowed identifying and answering a specific research question, understanding the theoretical concept and obtaining information needed for the research.

Figure 3 presents the main factors, which affect deciding on the best place for logistics centre. All these factors together present one decision. On the basis of the main factors, the authors determined 8 factors for the literature review.



**Fig. 3.** The most important impact on deciding of place selection (made by the authors).

It is important to define impacting factors for choosing the best location for logistics centre. After the literature review, the authors distinguished 8 factors:

- Location near city;
- Environmental issues;
- Financial aspect;
- Possible delay in delivery time;
- Location near important transport nodes;

- Delivery time to the client;
- Location near recycling plants;
- Governmental issues.

Table 1 shows differences in the impact of factors depending on the year of research.

**Table 1.** Selected Papers  
(Details of these selected papers can be found in the bibliography)

Author \ Factor	Location near city	Location near important transport nodes	Location near recycling spots	Possible delay in delivery time	Delivery time to the client	Environmental issues	Governmental issues	Financial aspect
Fernandez & Quiroga (2017)		+				+		+
Krystek & Alszer (2018)		+			+			
Agrebi, Abed & Omri (2015)	+	+	+	+		+	+	
Dolati Neghabadi, Espinouse & Evrard Samuel (2018)	+					+		
Bodaubayeva (2015)		+			+			
Sopha, Asih & Nursitasari (2018)	+	+	+			+		+
Anand, Yang, Duin & Tavasszy (2012)	+				+		+	
Tomic, Marinkovic & Markovic (2014)			+			+		
Singh, Chaudhary & Saxena (2018)	+	+	+		+			+
Muha, Sever & Sokolovckij (2018)		+			+	+		
Hamidi, Gholamian, Shahanaghi & Yavari (2017)		+						+
Demirel, Demirel & Kahraman (2010)		+	+			+		+
Liu, Zhang & Wang (2018)						+		+
Taniguchi (2014)	+					+		
Tadic, Zecevic & Krstic (2018)		+		+	+	+		
Kayikci (2018)								+
Devangan (2016)		+						+
Onden, Acar & Eldemir (2018)		+				+	+	+
Pokrovskaya (2018)		+	+					
Facchini, Pascale & Faccilongo (2018)		+			+			
<b>SUM</b>	<b>6</b>	<b>14</b>	<b>6</b>	<b>2</b>	<b>7</b>	<b>11</b>	<b>3</b>	<b>9</b>

From Table 1 one can see that the most relevant point for all authors is location near important transportation nodes. Many authors define that now all logistics centres are located near important transportation points, so they can be easily reached by suppliers and customers if needed.

Nowadays environmental and governmental issues are the most important ones. Many businessmen are willing to locate logistics centres near cities, to decrease possibility of transportation costs and possibility of workers' shortage.

### 3. CONCLUSION

1. Development of logistics centre is impossible without defining the best location of the centre. It is necessary to explore all data and previous studies about this field. To understand factors, which influence decision of location place for warehouse, it is important to make a systematic literature analysis. It is a way to gather the main information from other researchers.
2. It is very important that a company devotes a lot of attention to setting up the best logistics solutions for business. Choosing the best place for warehouse is one of the most important points of logistics development. Every company needs to know the possibility to increase some space in future, to change processes, if needed.
3. PRISMA flow diagram has allowed highlighting 20 main articles, which have been used in the research. Systematic literature analysis has enabled the authors to distinguish the main factors for warehouse place selection: location near important transport nodes to decrease costs, environmental issues that are important to decrease pollution, governmental restrictions – every company is trying to fit in frames of all rules from the government.
4. Development of logistics centres is directly related to location, where it is built. To be competitive in the market, owners of the logistics centres need to think about possible factors, which are important for clients or renters not only now but also in future.
5. As the numbers of logistics centres are still growing very fast, the next part of the research should explore factors, which affect the development of logistics centres.

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