

ECOLOGICAL LOGISTICS TERMS AND HISTORY OF THE DEFINITION

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Abstract. *Due to the world ecological awareness, pollution problems, climate changes, there are new types of trends emerging, one of them is related to ecological logistics. Eco-logistics is a concept and practice aimed at reducing the environmental impact of logistics and supply chain operations. Although, because the statement is relatively young, there is a number of meanings as well as opposite opinions regarding to the ecological logistics terms.*

Logistics is relatively young industry in the world, although, due to rapid development of technologies, logistics became a significant actor in business, especially in transportation services. It refers to the process of planning, implementing, and controlling the efficient flow and storage of goods, services, and information from the point of origin to the point of consumption or delivery. Eco-logistics is a subtype of logistics, which is aimed at reducing the environmental impact of logistics and supply chain operations. The history roots of the term start in 1960s with the Ecological revolution, as a result, during next decades ecology become more significant due to major problems in the world. There were introduced a number of definitions and familiar terms that can be differ in some aspects, nevertheless, the objective of eco-logistics is the same for each of them.

Ecological logistics is a measure and sustainable policy taken by the logistics industry to minimize the environmental impact on transportation, warehousing, and other logistic activities. This policy is aimed to create a sustainable value that balances the economic and environmental efficiency. The familiar meaning is related to the definition of green logistics. However, green logistics emphasizes energy efficiency, emissions reduction, waste minimization, and the use of environmentally friendly transportation methods and packaging materials. The main goal of green logistics is to minimize the negative ecological footprint associated with the movement of goods. It involves adopting eco-friendly practices and technologies to make the transportation and distribution of goods more sustainable. For instance, implementing electric or hybrid delivery vehicles, optimizing transport routes to reduce fuel consumption and employing energy-efficient warehousing practices are all examples of green logistics.

Whereas, eco-logistics is a broader concept that encompasses not only the environmental aspects of logistics but also social and economic factors. It focuses on achieving sustainability across all dimensions, often referred to as the "triple bottom line".

The concept of **triple bottom line** can be divided into "three P's": profit, people, and the planet. Different companies can use these categories to form their environmental responsibility and define any negative social impacts to which they might be contributing [1]. As a result, companies can integrate environmental practices into every stage of their business processes including transportation, supply chains, manufacturing, and renewable energy usage, consequently, it will positively impact society and the environment in addition to turning a profit. In terms of profit, strategic planning is generally playing a big role for maximizing profits as well as reducing costs and mitigating risk. The second component of the triple bottom line is related to people or. It's crucial to make the distinction between a firm's shareholders and stakeholders. As firms have increasingly introduced sustainability, they've shifted their focus toward creating value for all stakeholders impacted by business decisions, including consumers and employees. The final component of the triple bottom line is concerned with making a positive impact on the environment. Since the birth of the Industrial Revolution, large corporations have contributed a staggering amount of pollution to the environment, which has been a key driver of climate change and environmental concerns.

Ecological logistics is regarded as a logistic subsystem, whereby it is oriented to logistic processes, and in particular to collection, storage and transport, and the object of operation of ecologistics is waste. So, ecologistics is concerned with the mitigation of the impact of companies' activities on the natural environment, involving the reuse of waste (also waste packagings). It aims at the optimal solutions to the collection, storage, removal and recycle or environmentally and socially nonburdensome disposal of different types of waste. Figure 1 shows different types of ecological logistics terms, which divers in means of sphere coverage such as economics, resources, transportation and pollution.

Some definitions of ecologistics are strictly connected to the flows of waste from the point of its origin until its reuse or utilization. By contrast, **reverse logistics** was defined in early studies as the application of logistics to the recycle and disposal of waste and the management of dangerous waste, while in a broader understanding, logistic activities were pointed out, which aimed at the reduction of resources utilization, the recycle of substances, the reuse of materials and the disposal of waste.

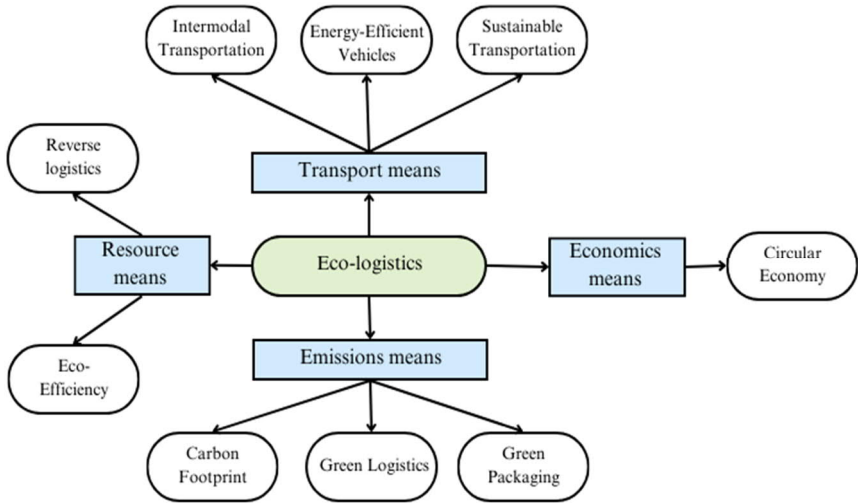


Figure 1 - Diversity of eco-logistics terms

Reverse logistics can therefore be understood in either a narrower or broader sense.

Secondly, in the context of the **sustainability term**, ecologistics can denote logistics practices and strategies that prioritize sustainability goals. This includes minimizing waste, conserving resources, and ensuring the long-term viability of supply chains while minimizing negative environmental impacts.

Thirdly, some definitions of ecologistics may focus specifically on **transportation-related activities** and their environmental impact. This can encompass the use of green transportation methods, such as electric vehicles or alternative fuels, to reduce carbon emissions. Ecologistics can be viewed as a subset of supply chain management that places a strong emphasis on ecological factors. This includes assessing and mitigating the ecological footprint of supply chains, considering the impact on ecosystems, and promoting biodiversity conservation.

The ecological logistics is a young term, and it emerged at the start of 1960s. The crucial role of emerging ecological trends played the "Ecological Revolution of the 1960s", it refers to a period in history when environmental awareness and activism significantly increased, particularly in the United States but also in many other parts of the world. Consequently, by 1967, the federal government of USA had passed the first Clean Air Act, the first federal emissions standards and the first list of

endangered species (including the bald eagle, America's national symbol). These laws were a start, but they did not go far enough to address the serious environmental problems facing the nation [2]. Despite this, the period was characterized by a growing concern for environmental issues and a push for greater environmental protection and conservation.

While the term "eco-logistics" may not have been widely used during the 1970s, the decade saw significant developments in the field of logistics with an increasing focus on environmental considerations. The 1970s oil crisis, triggered by geopolitical events in the Middle East, underscored the vulnerability of transportation systems dependent on fossil fuels. This led to increased interest in fuel efficiency and the development of more fuel-efficient vehicles and transportation technologies. Also, a significant role was played by the first Earth Day on 22 of April in 1970. Senator Gaylord Nelson promoted Earth Day, calling upon students to fight for environmental causes and oppose environmental degradation [3]. By the twentieth anniversary of the first event, more than 200 million people in 141 countries had participated in Earth Day celebrations. As a result, the environmental consciousness and regulatory framework surrounding logistics and supply chain management continued to evolve throughout the following decades.

The concept of sustainable development gained great traction during the 1980s, emphasizing the need to balance economic growth with environmental protection. The Brundtland Report, published in 1987, played a vital role in popularizing this idea. The World Commission on Environment and Development explored the issues of environmental degradation, attempted to understand the interconnections between social equity, economic growth, and environmental problems, and developed policy solutions that integrated all three areas. Also, while climate change wasn't yet a dominant issue in the 1980s, there was growing concern about the greenhouse effect and its potential impact on the planet. The establishment of the Intergovernmental Panel on Climate Change in 1988 was a significant development as well. It was launched to prepare, based on available scientific information, assessments on all aspects of climate change and its impacts, with a view of formulating realistic response strategies.

Ecological logistics in the 1990s continued to evolve, building upon the environmental awareness and movements that emerged in the previous decade. This period witnessed significant global environmental events and the strengthening of international cooperation on environmental issues. The United Nations Conference on Environment and Development, also known as the Earth Summit, was held in Rio de Janeiro in 1992. This event resulted

in the Rio Declaration on Environment and Development and the Agenda 21 action plan, which emphasized sustainable development as a global priority. Moreover, green consumerism gained popularity in the 1990s, with consumers increasingly choosing environmentally friendly products and companies that demonstrated a commitment to sustainability.

Ecologistics in the 21st century has seen a significant evolution in response to the increasing urgency of global environmental challenges. This century has been marked by a heightened focus on sustainability, climate change mitigation, and the integration of ecological principles into various aspects of society. One of the most important activities in 21 century is growth of e-commerce services. This has prompted logistics companies to explore eco-friendly delivery options such as electric bikes, drones, and optimized route planning to reduce emissions and congestion in urban areas. Also, there was introduced a practice of adoption of sustainable packaging. So, companies have been increasingly focusing on eco-friendly packaging materials and designs to reduce waste and minimize the environmental impact of their logistics operations. Figure 2 shows the evolution of the recycling of plastic packaging in European Union during the 21st century.

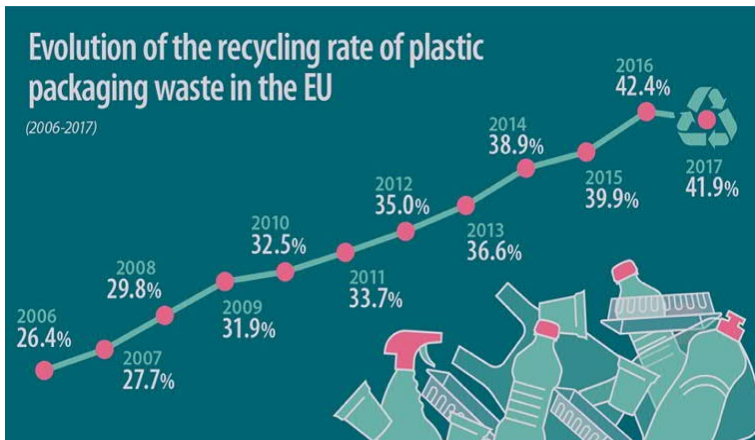


Figure 2 - Evolution of the recycling rate of plastic packaging in EU [4]

Consequently, there are major advancements in technology in this century, including the Internet of Things (IoT), blockchain, and data analytics, have enabled logistics companies to track and optimize their operations for sustainability. These influential events and developments highlight the ongoing shift toward more sustainable and environmentally responsible logistics practices in the 21st century, as organizations and

governments recognize the need to address environmental challenges and reduce the ecological footprint of logistics operations

Conclusion

Logistics continues to implement new technological features and trends involving environmental factors. Even though, eco-logistics has a number of familiar and even opposite definitions formed by various scientists, the objective of the statement is minimization of the environmental impact on transportation, warehousing, and other logistic processes. The worlds and public awareness in the ecological sphere become more interested in solving or predetermining pollution issues. As a result, there we introduced or launched innovative services which are not only make logistics operation more efficient in terms of economy but they decrease harmful impact on ecology in general like waste packaging, electrical vehicles, e-commerce, and so on.

References

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