

9. Waste Management and Logistics from a Sustainability Perspective

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Abstract:

Waste management and logistics play an important role in sustainability. With the increase in industrial processes and consumption habits, the amount of waste has also increased significantly. Therefore, effectively managing and transporting waste is critical to reducing environmental impacts. From a sustainability perspective, a number of strategies and practices have been developed in the field of waste management and logistics. The main purpose of these strategies is to reduce waste, encourage recycling and minimize the environmental impacts of waste disposal. Waste management and logistics can contribute to sustainability goals by reducing waste at source. With waste reduction strategies and recycling programs in production processes, the amount and harmful effects of waste can be significantly reduced. From a logistics perspective, effectively transporting and managing waste can help reduce environmental impacts. While efficient transportation and distribution systems can reduce waste generation and carbon emissions, logistics practices that encourage recycling and reuse are also important for sustainability. As a result, waste management and logistics are critical to sustainability. Reducing, recycling and efficient transportation of waste is important in reducing environmental impacts and using resources more efficiently. Therefore, it is of great importance to adopt and implement sustainability-oriented strategies in the field of waste management and logistics.

Keywords:

Waste management, Logistics, Sustainability

9.1 Introduction:

Throughout history, people have believed that natural resources are infinite, and this belief has caused them to ignore environmental problems and neglect issues such as waste management. However, since the early 1970s, environmental problems have become increasingly important to states and institutions. This change began with the Environment Conference held by the United Nations in Stockholm in 1972. This conference enabled environmental problems to be addressed on an international platform and marked the beginning of a new era in the field of environmental law.

In the Stockholm Declaration, people's "right to live in a dignified environment" was emphasized and the transformation in environmental law began. Later, in 1974, the Mediterranean Action Plan draft was adopted with the participation of 16 countries

bordering the Mediterranean, and thus regional environmental protection efforts began (Mostafa, 2020). In 1987, the Brundtland Report defined the concept of sustainable development, emphasizing the balance between the environment and economic growth. This report encouraged the adoption of sustainability strategies in solving environmental problems. The UN Conference on Environment and Development, held in Rio de Janeiro in 1992, was an important turning point in determining environmental policies at the international level. As a result of the conference, five basic documents emerged, such as the Rio Declaration, Agenda 21, Framework Convention on Climate Change, Convention on the Conservation of Biological Diversity and Declaration on the Protection of Forest Assets. These documents encouraged international cooperation in tackling environmental problems. However, more efforts were required to implement environmental policies and solve environmental problems. Binding legal instruments such as the Kyoto Protocol were especially important in reducing greenhouse gas emissions.

This protocol encouraged countries to reduce carbon emissions and was an important step in achieving environmental goals. Businesses have also begun to increase their sensitivity to environmental problems (A Jalil et al., 2016). Green supply chain management practices, in particular, have helped businesses reduce environmental impacts throughout the supply chain. However, businesses need to consider their environmental activities from a broader perspective and extend their sustainability strategies to all functional areas.

As a result, international cooperation and sustainability strategies are becoming increasingly important in combating environmental problems. Green supply chain management practices of businesses play a critical role in reducing environmental impacts, and studies in this field are expected to increase further in the future (Winkler & Kaluza, 2006).

9.2 Waste Management:

Waste management is a discipline that starts at every stage of a product's life cycle and includes processes such as production, consumption, waste generation, collection, recycling or disposal of waste. This management style includes steps such as reducing waste at its source, separating it by type, collecting it, temporary and intermediate storage, recovery, transportation, disposal and control. Waste management covers processes such as minimizing medical, domestic, hazardous or non-hazardous waste, access to resources, separate collection, storage, when necessary, transfer of waste to centers, processing, disposal, recycling and closure. These processes are complemented by management and monitoring operations in waste management facilities, such as closure maintenance and control (Reno, 2015).

The magnitude and diversity of the waste problem cannot be solved with a single approach. Therefore, effective waste management can be created by combining different methods. This internationally accepted approach is called "Integrated Waste Management". Integrated waste management aims for sustainability in both environmental and economic terms by addressing waste management components holistically. In this context, waste management cannot be expected to focus on a single waste type or source. Integrated waste management takes into account that waste comes from different sources and types and includes a variety of waste management strategies (Asnani, 2006).

These strategies include waste minimization, recycling, disposal, and other methods. Waste management cannot be solved by a single approach and must be addressed holistically, taking into account various waste types and sources. Integrated waste management aims to ensure environmental and economic sustainability by taking these differences into account (Bhada-Tata & Hoornweg, 2012).

9.3 Sustainable Logistics:

In recent years, environmental problems such as greenhouse gas effect, global warming, decrease in energy resources and carbon emissions have been increasing. Therefore, sustainability in production and transportation activities becomes important. Sustainability is a concept that aims to minimize negative impacts by reducing environmental problems. When examining the distribution of greenhouse gas emissions in the logistics sector, recent reports show that 89% of transportation and 11% of warehousing contribute to greenhouse gas emissions (Grzybowska & Awasthi, 2019).

Therefore, factors such as traffic management, effective use of resources, increasing service quality, creating a fair competition environment, energy efficiency and environmental awareness are important for sustainability in the logistics sector. In the field of international transportation, carbon emissions occur due to the use of different transportation options and the use of vehicles that generally run on fossil fuels. This situation emphasizes the importance of addressing international shipping activities with sustainability strategies. On a sectoral basis, different approaches such as green logistics, lean logistics and reverse logistics help realize more sustainable activities (Frota Neto et al., 2008).

These approaches, supported by digitalization and new technologies, lead to significant developments in the logistics sector. With the concept of sustainability, various innovations and practices are coming to the fore in the logistics industry for reducing environmental impacts and for a greener future. For this reason, new approaches and technologies must be constantly adopted in order to transform the sector into a structure that is environmentally friendly and uses resources efficiently (Shahzad et al., 2022).

9.4 Conclusion:

Waste management is a concept that is becoming increasingly important as a result of modern industrial processes and consumption habits. This process includes the entire life cycle of products, from production to consumption, from waste generation to disposal. In this context, waste management includes various steps such as reducing waste at the source, separating it by type, collecting it, temporary storage, recovery, transportation, disposal and control. Sustainable waste management adopts an environmentally and economically balanced approach. While this approach takes into account environmental factors such as minimizing waste and efficient use of resources, it also aims to ensure that waste management processes are economically sustainable. Integrated waste management ensures the effective implementation of waste management strategies by addressing waste management components in a holistic manner. This approach ensures that waste management processes are designed and implemented to include waste from different sources and types.

In this context, it is important to bring together different approaches for the development and implementation of waste management strategies. Waste management requires addressing a wide range of waste management strategies rather than focusing on a single type or source of waste. These strategies include waste minimization, recycling, disposal and other methods.

Consequently, waste management must be addressed in a holistic manner, taking into account various waste types and sources. Integrated waste management aims to ensure environmental and economic sustainability by taking these differences into account. Therefore, the development and implementation of waste management strategies is important from both environmental and economic perspectives. These strategies ensure that waste management processes are managed effectively and the negative effects of waste on the environment are reduced.

9.5 References:

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