

Comparative Perspectives on Modern Logistics Transportation Based on Green Logistics in Europe and Indonesia: Concept of Sustainable Economy

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ABSTRACT

The concept of logistics is a supply chain system to facilitate the movement of goods and resources (raw materials), delivery scheduling, storage, and marketing to consumer endpoints that support economic growth. The increase in logistics transportation also has a negative impact, especially environmental problems, the effectiveness of logistics transportation, and the quality of materials and goods which will eventually involve economic problems. This article aims to compare the implementation of modern logistics transportation systems in the European Union and Indonesia with the application of green logistics. This study uses a comparative study method with a qualitative descriptive approach to modern logistics transportation that applies the concept of green logistics. The problem of European Union logistics transportation is only in the human resources sector and congestion in a certain period. The solution is to add regulations related to alternative or manipulated road systems to reduce congestion. On the other hand, the problems that exist in Indonesia are related to the low facilities, regulations, and investment for logistics transportation. As a solution, several regulations and programs have been implemented as a green logistics concept such as anti-ODOL regulations, and the sea toll program.

1. Introduction

Economic growth marked by the continued development of public facilities development, change, population growth, and increased income is not only good for urban areas, but also for people in remote areas who depend on the role of the logistics system Gudmundsson et al, (2016). The logistics concept is part of the supply chain system that has been adopted by modern companies to facilitate the movement of goods and resources (raw materials), delivery scheduling, storage, and marketing to the endpoint, namely the consumer (McKinnon, 2015). Along with advances in technology, the economy, and the community's need for finished products or ready-to-use products, this occurs when companies provide these products. Logistics transportation is important in a supply chain system and includes logistics systems because transportation is a driving factor that determines the supply chain system.

Finally, the increase in the logistics sector every year is in line with the increase in people's needs for certain products, and the flow of logistics transportation in all sectors is also on an increasing trend, not only the positive effect of the construction of many infrastructures, the needs of the community. meet, and improve the welfare of the people who provide jobs, but also have a negative impact, especially environmental problems, because of the effectiveness of logistics transportation, and the quality of materials and goods which will ultimately involve economic problems (Raap et al, 2017). Excessive use of fuel, transportation modes that are often hampered, and damage to road and bridge facilities harm the economy if they continue to be ignored (Sukortopromme & Onputtha, 2019).

Green logistics is not only a scientific theory and business concept but also a logistics concept development. The use of green logistics methods is a significant competitive advantage for transportation companies. Green logistics brings positive results not only for the company but also for the country and society. Sometimes green logistics is reduced to purely environmental protection. Moreover, green logistics is part of sustainability which in this article focuses on economic aspects (Larina, et al, 2021).

This article aims to compare the implementation of a modern logistics transportation system in the European Union with that in Indonesia. Also in this article, green logistics becomes the main topic of discussion and its application to transportation logistics in the European Union and Indonesia which is one of the sustainable development, economic sectors. Analysis of logistics transportation problems, solutions that have been implemented, and implementation for the future are important things that will be discussed in the article. The comparison between the EU and Indonesia in terms of logistics transportation conditions is an interesting case, due to different geographical conditions and the quality of human resources, but with the progress of the logistics system, the EU can become a role model for Indonesia to improve all aspects of the logistics system such as regulation, human resources, and technology.

2. Methodology

This study uses a comparative study method with a qualitative descriptive approach to modern logistics transportation that applies the concept of green logistics in the European Union (EU) and Indonesia. As a comparison from a logistical and economic perspective, this article uses two types of parameters, namely the Logistic Performance Index (LPI) and the Global Competitiveness Index (GCI). The LPI index is a tool that allows to identify challenges and opportunities in the logistics of the region/country under study and indicate what needs to be done to improve logistics efficiency. It is a weighted average of the scores on the six main criteria. They are the effectiveness of border control processes (including customs), quality of infrastructure (eg: ports, railways, roads, and information technology), ease of arranging shipments at competitive prices, competence and quality of logistics services, ability to identify and track shipments, delivery of goods on time within the scheduled delivery time. Meanwhile, GCI is a type of competitiveness that is defined as a set of institutions, policies, and factors that determine the level of efficiency/productivity of a country. This level of efficiency determines the level of wealth and income of citizens (Sergi, et al, 2021).

3. Hasil dan Pembahasan

3.1 Logistics Transportation Problems in European Countries

As an organization whose members are almost entirely in the category of developed countries, the European Union (EU) is a major player in world economic growth. The role of the logistics system is important in supporting all activities in EU countries, both from the export and import sectors. The policy of free movement between member countries is an advantage for the logistics system, especially transportation because of the ease in distributing goods and materials around the EU. The logistics system in the EU is one of the best in the world in terms of the technology used, quality human resources, and very adequate supporting facilities such as roads, connecting bridges, as well as public awareness of EU member countries about sustainable development (CIVITAS, 2020).

Geographically, the EU area covers almost 4,475,757 km² with a sea area of only 3.08%, and a population density of 117.2 people/km². The EU area is dominated by land as shown in Figure 1 so that the logistics transportation that is often used is land and air transportation. However, with the advances in technology applied, a logistics system that is almost perfect, and supported by adequate geographical conditions and facilities, the EU logistics system also has several obstacles that often become obstacles in the logistics transportation process, including the policy of free movement between EU member countries. This causes congestion if passing through certain areas (European Commission, 2018).

Production and trade are becoming more individualized, along with the increasing volume of goods delivered with smaller shipments and today's increasingly demanding customer needs (Szymczyk, 2019), based on (Sergi, et al, 2021) research on competitiveness and logistics performance indices, the EU human factor is much more important to further increase the LPI which means the general public's sentiment about the environment and gender equality is one of the problems in the EU logistics system and will be a matter of trust in this sector, especially logistics transport companies.



Figure 1 European Union Country Distribution

Source: European Commission, 2018

3.2 Logistics Transportation Problems in Indonesia

As an archipelagic country with more than 17,000 islands, Indonesia has its own advantages and disadvantages. The advantage of having these assets is that of course for tourism destinations it will increase state income and improve the economic system, especially in the tourism area, so that the need for goods and materials will increase and have an impact on increasing logistics demand throughout the region, especially areas with a high economic level. Transportation logistics will also increase from economic growth and demand for goods and material resources that are not available in the local market. While the weakness that can be found related to the coordination of more than 17,000 islands is that logistics transportation must use multimodal transportation which is a combination of more than one transportation mode, for example using ships and trucks (Kuncoro, 2013).



Figure 2 Indonesia

Source: Kuncoro, 2013

Indonesia has an area of 1,910,931 km² with a sea area of 4.85% and a population density of 141 people/km². Based on a geographical perspective, transportation in Indonesia is dominated by land and sea transportation, using land transportation such as trucks, and sea transportation such as ships. Indonesia's logistics costs to GDP as a percentage are 27%, which means that logistics costs are quite high (Aziz and Abidin, 2021), and dwelling time also contributes to the increase in logistics costs for Indonesian logistics costs (Kennedy, 2019).

Based on (Sergi, et al, 2021) research on competitiveness and logistics performance index, in Asia, especially in Indonesia, the main cause of high logistics costs in Indonesia is the condition of infrastructure which is considered inadequate to support the smooth flow of transportation, including in this case traffic. logistics. Likewise, the intermodal or multimodal transportation system is still experiencing problems due to the difficulty of transportation access from the production center to the port and airport or vice versa. This obstacle is due to the not yet optimal infrastructure of ports and airports. This causes the quality of service to be low and service rates to be expensive.

The phenomenon of ODOL (Over Dimension and Overload) violations in freight transportation in Indonesia has become a serious problem. The over-dimensional vehicle is a condition where the dimensions of the transport vehicle are not in accordance with production standards and the provisions of laws and regulations, while overload is a condition where the vehicle carries a load that exceeds the specified load limit. In practice, over-dimension overloading (ODOL) is considered very detrimental to the government and society. Road damage due to ODOL triggers an increase in the maintenance budget for national roads, toll roads, and provincial roads with a large cost, averaging Rp 43.45 trillion per year (Balitbanghub, 2021). The impact of ODOL in addition

to causing road damage also causes damage to other infrastructure such as bridges, ship damage in crossing cases, and causes traffic accidents.

3.3 Application of Green Logistics as a Solution in European Countries

The EU has implemented green logistics as indicated by the logistics system in the EU regulations on transportation logistics system ETS (Emission Trade System). The regulation limits the use of fossil fuels that have an impact on the environment. The green logistics concept also provides a solution to congestion that occurs due to logistics transportation such as providing dedicated routes to trucks as logistics transportation, night delivery schemes (Geroliminis and Daganzo, 2015).

Regulations on involving more women workers in the logistics transportation system and the application of green logistics as a social impact (European Commission, 2018). By implementing green logistics for ETS regulation, and involving more female workers, increasing public awareness about environmental issues and labor rights, and their impact on companies or manufacturers that use community logistics transportation will provide positive sentiment and increase brand awareness for companies or manufacturing and have an impact on increasing income. The provision of dedicated routes, and night delivery schemes for road transportation for logistics also provide benefits to the economic sector by reducing transportation time and fuel consumption.

3.4 Application of Green Logistics as a Solution in Indonesia

The implementation of green logistics in Indonesia in recent years has had an impact not only on economic growth but also on logistics transportation regulations. Therefore, it is still necessary to improve and understand Green Logistics in Indonesia. Green Logistics will be the key to the success of logistics in Indonesia, although its implementation still requires considerable investment and additional costs. Efficiency in the long term is expected to exceed previous investments, and Green Logistics is not always about investing in expensive assets. The application of Green Logistics that can be carried out through efficient and environmentally friendly operational practices will have a significant impact in the future on the environment and business (Puspitasari, et al, 2019).

The concept of green logistics is also applied in government regulations for the transportation of anti-ODOL (Over Dimension and Overload) goods. The regulation is implemented based on Law Number 2 of 2019 concerning the Regulation of the Transportation of Goods. In this case, it means that logistics transportation companies must be aware that not only for environmental sustainability but also for economic growth based on the weaknesses of ODOL freight transportation (Rozi, 2019).

The application of green logistics is also carried out in sea transportation. The sea toll is a system that connects all important ports in Indonesia, this system will reduce all cost factors, such as shipping costs, storage costs, and fuel consumption which usually sea transportation only moves from port-to-port in two directions (Sinaga, 2020). The sea toll system also increases economic growth through an efficient system based on Indonesia's geographical factors (Salamah, 2021). As shown in Figure 3, the Sea Toll project connects five main ports – Belawan and Kuala Tanjung in North Sumatra, Batam in the Riau Islands, Tanjung Priok in Jakarta, Tanjung Perak in Surabaya, East Java, Makassar in South Sulawesi, and Sorong in Papua as well as other small ports throughout the country (Sa'adah, 2019).



Figure 3 Sea Toll Route in Indonesia

Source: Sa'adah dkk, 2019

The application of green logistics in both the EU and Indonesia is in accordance with the geographical conditions, human resources, and existing facilities in each country. Based on the LSI and GCI indexes, Indonesia is ranked 46th LSI and 45th out of 160 countries and EU members are in the top 10 LSI and GCI rankings, but there are countries in the EU that rank much lower than Indonesia in both LSI and GCI rankings. Indonesia should not follow the regulations applied in the EU regarding logistics transportation, due to differences in geographical conditions and human resources. However, Indonesia can apply developments in logistics technology such as vehicle technology, storage technology, and the concept of facility technology.

4. Conclusion

Based on a comparative study of the application of green logistics in the logistics transportation system for the economic sector, first, EU member countries have almost complete sectors to implement the sustainable development goals of the economic sector, the environmental sector, and the community sector. The problems of the European Union's logistics transportation are only in the human resources sector and vehicle congestion for a certain period. The solution that can be applied is to add regulations to be able to use alternative or manipulated road systems to reduce congestion. Second, the problems that exist in Indonesia are due to the low condition of facilities, regulations, and investment for logistics transportation. As a solution, there needs to be a disciplined application of several existing regulations and programs that should be implemented sustainably as a supporter of the green logistics concept, such as anti-ODOL regulations, and the sea toll program.

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