EVALUATING THE BUSINESS VIABILITY OF SUSTAINABLE TRANSPORTATION INITIATIVES: A CASE STUDY OF GREEN LOGISTICS IMPLEMENTATION

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Abstract

Transportation is an important part of this era of globalization. But at the same time transportation, especially in the field of logistics, often harms the environment. This research will then look at the impact of sustainable transportation and the implementation of green logistics on the environment. This research will be carried out using a descriptive qualitative approach. The data used in this study comes from various relevant previous research results or studies. The results of this study then found that the negative impact of conventional transportation led to the importance of changes in transportation management. Through the adoption of innovative technology, smart route management, and environmentally friendly vehicles, a company will be able to reduce operational costs, increase efficiency, and significantly reduce the negative impact it has on the environment. Sustainable transportation and green logistics are strategic opportunities for future businesses.

Keywords: *Sustainable Transportation, Green Logistics, Environment.*

A. INTRODUCTION

In the current era of globalization, transportation plays a central role in facilitating the movement of goods and services around the world. Businesses rely on efficient transportation systems to link supply chains and maintain a smooth flow of goods. However, rapid economic growth and intensification of transportation activities also have a significant impact on the environment and natural resources (Balsalobre-Lorente et al., 2023). Population growth and rapid urbanization led to an increase in demand for transportation, especially freight transport. However, unsustainable transport initiatives can lead to increased greenhouse gas emissions, air pollution, and overuse of resources. This trend destroys the balance of the ecosystem and causes serious environmental problems (Sodiq et al., 2019).

Awareness of the negative impacts of conventional transportation has driven a shift towards sustainable transportation. Businesses are increasingly considering implementing more environmentally friendly and sustainable initiatives in their operations. This includes the use of green technology, alternative fuels, and reduced emissions. Logistics has an important role in realizing sustainable transportation (Jaiswal et al., 2021). Supply chain efficiency and good inventory management can

reduce operational costs and environmental footprint. Green logistics, a concept in which sustainability principles are implemented throughout the supply chain, offers a solution for companies seeking to reduce their negative impact on the environment (Mashayekhy et al., 2022).

Sustainable transport and green logistics initiatives not only have a positive impact on the environment, but they can also provide direct benefits to businesses. Reducing operational costs, increasing efficiency, and increasing a company's reputation as an entity that cares about the environment can increase competitiveness and business sustainability in the long term (Kalyar et al., 2020). In many areas, governments and regulatory agencies are increasingly pushing companies to adopt sustainable business practices. Regulations related to greenhouse gas emissions, environmental hygiene standards, and energy use can encourage companies to change the way they operate (Khan et al., 2021).

Consumer awareness about the environmental impact of the products and services they buy is increasing. Consumers tend to support companies that adopt sustainable business practices. Therefore, sustainable transportation and green logistics initiatives can be strong selling points for companies. To overcome the challenges of sustainable transportation, collaboration between various stakeholders is key. Companies can work with suppliers, business partners, and governments to develop joint solutions that support sustainability goals (Vienažindienė et al., 2021).

One growing approach is green logistics, where energy efficiency, waste reduction, and transportation optimization are integrated into supply chain management. Case studies of implementing green logistics in sustainable transport can provide insight into the benefits and challenges associated. In this context, this study aims to evaluate the business feasibility of sustainable transport initiatives, with a focus on implementing green logistics. This study aims to analyze how green logistics practices can provide business benefits, maintain environmental sustainability, and embrace change in a changing business context.

B. LITERATURE REVIEW

1. Sustainable Transportation

Problems in transportation, until now are one of the problems that have a quite large adverse impact and are difficult to overcome. The problem of congestion which has an impact on increasing air pollution, prolonged delays, and waste of energy are some of the many problems faced by a city related to transportation problems (Al-Thani et al., 2022).

This problem is closely related to the environment, social, and economic. Seeing how important these three things are in people's lives, this transportation problem must be addressed immediately. At a time like this, the best thing to do is to find the right solution, namely by taking a "Predict and Prevent" approach which refers to the application of "Sustainable Transportation" (Streimikiene et al., 2021).

The term sustainable transportation was initially developed in line with the emergence of the term sustainable development in 1987 (World Commission on Environment and Development, United Nations). According to Todd Litman, what is meant by Sustainable Transportation is a transportation system that pays attention to 3 (three) important elements, namely the environment (environment), social (social),

and economy (economy), where the transportation system is used up to the next generation (Rao, 2021). In other words, sustainable transportation can be interpreted as a system that is used to prevent or anticipate emerging transportation problems and provide access to the basic needs of individuals or communities in a safe, financially affordable, efficient operation, alternative availability, mode selection, and support the pace of economic development (Etminani-Ghasrodashti et al., 2021).

According to the Organization for Economics and Development, sustainable transportation is transportation that does not cause impacts that endanger public health or ecosystems and can meet existing mobility needs consistently by taking into account: (a) the use of renewable resources at a level lower than the level of regeneration; (b) the use of non-renewable resources at a rate lower than the development rate of alternative renewable resources. In general, sustainable transportation can be interpreted as an effort to provide an appropriate transportation system that can provide maximum accessibility and minimize negative impacts on the environment and not cause problems in the future (Luca et al., 2023).

The Center for Sustainable Development defines a sustainable transportation system as one that provides access to the basic needs of individuals or communities in a safe manner and a manner consistent with human and ecosystem health, with present and future societal equity. Financially affordable, operating efficiently, providing alternative modes of choice, and supporting the pace of economic development. Limiting emissions and discharges following natural absorption capabilities, minimizing the use of energy from non-renewable sources, using recycled components, minimizing land use, and producing as little noise pollution as possible (Bamwesigye & Hlavackova, 2019).

Sustainable transportation (sustainable transportation) is one aspect of overall sustainability (global sustainability) which has three interrelated components, namely environment, society, and economy. In this interaction, transportation plays an important role in the planning and provision of a transportation system that must pay attention to economic, environmental, and community aspects (Melkonyan et al., 2020).

Several important things must be considered in the effort towards creating a sustainable transportation system, as follows:

a. Social justice (social equity); covering the problem of transportation for the poor, evictions, women and transport, mobility of children, and people with disabilities.
b. Sustainability from an environmental perspective; include loss of green space and habitat, water pollution, demand for fuel oil, air pollution, noise, global warming, and vehicle waste.
c. Health and safety; These include traffic-related deaths, air pollution, and health, the dangers of a passive (inactive) lifestyle, and the dangers of the road.
d. Quality of life and community; including severance of communities, invasion of space, destruction of historical relics, and crime.
e. Economy and low cost (Sovacool & Del Rio, 2022)

2. Green Supply Chain

In the last decade, many companies have started to provide cheap, quality, and fast products. If a manufacturing company only relies on internal improvements it will not be enough. Realizing the three aspects requires the role of all parties, starting from suppliers who manage semi-finished materials, and factories that manage semi-finished materials into finished materials (Hindarto et al., 2021). The entire distribution network delivers products to the hands of the final consumer. The importance of the awareness of all parties in creating products that are cheap, fast, and of good quality was the beginning of a new concept in the 1990s, namely regarding the supply chain (Mak & Max Shen, 2021).

A supply chain is a network of partners who collectively transform basic commodities (upstream) into finished products (downstream) that are of value to end customers and manage them at each stage. A supply chain is a network of companies that work together in creating and delivering products to the hands of end users (Moshood et al., 2021). Based on the above understanding, it can be concluded that the supply chain is an integration of the company's partner network of all activities starting from designing, designing, and controlling the flow of materials and information along the supply chain which aims to optimize present and future customer satisfaction. Based on this definition, it is said that the supply chain is a logistics network (Awan et al., 2022).

Concern for the environment is not an option but a necessity for a member of supply chain management. The combination of environmentally friendly supply chains is defined as a combination of environmentally friendly purchasing, manufacturing activities, environmentally friendly material processing, environmentally-friendly distribution and marketing, and reverse logistics. According to Beamon, the goal of an environmentally conscious supply chain is to consider the final and present environmental impact of all products and processes to protect the environment (Hervani et al., 2022).

Green supply chain management is the concept of integrating environmental thinking in supply chain management, which includes product design, procurement and selection of raw materials, manufacturing processes, product delivery to end consumers, and also managing product flow after consumer use which is managed by considering environmental friendliness (García Alcaraz et al., 2022).

According to Chin, Tat, & Sulaiman Green supply chain is a concept that integrates supply chain management with environmental thinking that aims to reduce waste, emissions, energy, and solid waste. From some of the definitions above, it can be concluded that Green Supply Chain Management is a supply activity starting from the supply of raw materials, manufacturing production processes, and consumer shipping to reverse logistics that incorporates environmentally sound thinking into practice. Not only considering environmental aspects in the process but also productivity and generating more profit for the company (Hartono et al., 2023).

The purpose of applying the Green supply chain concept to companies is to improve environmental and financial performance, but the scope of Green supply chain management is very broad including internal and external environment, investment recovery, and eco-design. In addition to implementing the Green supply chain management concept, besides being able to reduce environmental pollution, it can increase the efficiency of companies in the supply chain and reduce the use of

resources in the production process, especially the procurement of raw materials (Pinto, 2020).

Green supply chain management plays an important role in the successful implementation of Green industries, where every activity along the supply chain management has risks and negative impacts on the environment. Therefore, supply chain processing that is environmentally conscious by considering the impact on the environment from activities along the supply chain management is indispensable to maintain sustainability and protect the environment (Esmaeilian et al., 2020).

C. METHOD

This research will be carried out using a descriptive qualitative approach which has been proven effective in gaining in-depth insights regarding the implementation of sustainable transportation and green logistics in a business context. This approach allows researchers to comprehensively understand how companies adopt sustainable practices and address the associated challenges. The data to be used in this study will be obtained through analysis and synthesis of previous studies and studies that have relevance to the objectives of this study. The collected research data will be analyzed carefully. This analysis includes identifying patterns and trends emerging from the results of different studies and comparing the findings with the current research objectives and context. Therefore, these data will be the main foundation for discussing the impact of sustainable transportation and green logistics in the business context. With this structured method, this research will be able to bridge information from various previous studies to comprehensively explain sustainable transportation practices and green logistics in a business context. Through careful analysis, this research will provide valuable insights into the benefits, challenges, and how to overcome obstacles in implementing this initiative. It is hoped that this research will make a valuable contribution to pushing businesses toward a more sustainable direction (Sari et al., 2022).

D. RESULT AND DISCUSSION

1. Business Transportation Sustainability and Challenges

Transportation has a crucial role in connecting markets, supplying needs, and driving economic growth. However, in today's business context, transportation is also a major cause of negative impacts on the environment and utilization of natural resources. In this section, we will discuss the impact of conventional transportation on the environment and resources, the increasing demand for transport as the economy grows, and the challenges businesses face in striking a balance between sustainability and operational needs.

Conventional transportation, especially that powered by fossil fuels, has a serious impact on the environment. Emissions of greenhouse gases, such as carbon dioxide (CO2), from vehicles, contribute to global warming and devastating climate change. In addition, other pollutants such as nitrogen oxides (NOx) and dust particles from vehicle exhausts can cause air pollution which endangers human health and ecosystems. The use of fossil fuels also accelerates the exploitation of limited natural resources, such as oil.

As the global economy grows, the demand for transportation is increasing. This increase occurred in both passenger and freight transport. The growth of international trade and urbanization accelerated the movement of goods and people. However, this increase in demand is often accompanied by increases in greenhouse gas emissions and air pollution, which can have negative consequences for air quality and the environment as a whole.

Businesses are faced with complex challenges in maintaining a balance between sustainability and operational needs. First, they must meet growing customer demands without sacrificing efficiency and profitability. This often leads to more vehicle use and increased emissions. Second, businesses need to overcome the technological and cost barriers that sometimes remain obstacles to adopting more environmentally friendly transportation alternatives.

In addition, regulatory uncertainty and policy changes can also affect business strategy. Efforts to shift to sustainable transport require investment and changes in infrastructure and operations. However, businesses need to overcome the challenge of matching investment return timeframes with long-term sustainability expectations.

In facing this challenge, businesses need to adopt a holistic approach, considering the integration of the latest technology, route optimization, use of alternative fuels, and cross-sector cooperation. Awareness of the negative impacts of conventional transportation encourages businesses to become proactive agents of change, developing innovations to mitigate environmental and resource impacts while meeting customer needs and achieving long-term business sustainability.

Meanwhile, the demand for sustainability increasingly dominates the view of modern business. Communities, customers, investors, and regulatory agencies are increasingly demanding that companies play an active role in reducing their environmental impact. To maintain balance, businesses need to embrace a new paradigm that combines economic growth with environmental responsibility. By prioritizing energy efficiency, using low-emission fuels, and better-managing logistics, businesses can reduce their impact on the environment.

Technological developments are also important catalysts in addressing the challenges of sustainable business transportation. Innovations such as electric vehicles, automation in logistics, and advanced data analytics allow companies to optimize their operations effectively. In some cases, these technological innovations can even result in higher efficiencies than conventional practices.

It is important to admit that changing the paradigm of business transportation is not an easy task. Technical challenges, initial investment costs, and uncertainty over results are some of the hurdles that must be overcome. However, companies that successfully integrate sustainable transport initiatives into their operations will reap significant long-term benefits. This includes reducing operational costs, increasing efficiency, a better corporate image in the eyes of consumers and stakeholders, as well as fulfilling social and environmental responsibilities.

To achieve the goal of sustainability in business transportation, cross-sectoral collaboration and cooperation is very important. Governments, companies, research institutions, and communities need to work together to develop holistic solutions that balance the operational needs of businesses with broader environmental responsibilities.

2. Green Logistics and Business Profits

Green logistics is an approach that focuses on integrating sustainability principles into supply chain management. Under this concept, companies seek to optimize their logistics processes by minimizing environmental impact, reducing waste, and increasing efficiency. The implementation of green logistics covers various aspects, such as selecting more efficient routes, using environmentally friendly transportation, and managing materials more wisely.

Green logistics not only generates environmental benefits but also has a positive impact on business operational efficiency and costs. Optimization of freight routes and more accurate inventory management reduces travel distances and delivery times. The result is reduced fuel costs, vehicle maintenance, and uptime. By planning routes efficiently and minimizing travel costs, companies can increase their profitability and operational efficiency.

In the context of sustainable transportation, green logistics provides a pathway to achieve the goal of reducing environmental impact. The use of alternative transportation, such as electric vehicles or low-emission fuels, reduces greenhouse gas emissions and air pollution that adversely affect human health and ecosystems. In addition, green logistics practices contribute to waste reduction through the optimization of material use, more efficient packaging, and reduction of secondary materials.

The implementation of green logistics also has strategic value in improving the company's image and reputation. Consumers and stakeholders are increasingly aware of the importance of corporate social and environmental responsibility. By implementing sustainable practices, companies can position themselves as positive actors in the business environment. They gain higher customer trust and create stronger long-term relationships.

Sometimes, technical challenges and initial costs become barriers to adopting green logistics. However, when companies can overcome these obstacles, they can enjoy several advantages. In terms of cost reduction, green logistics practices enable businesses to allocate resources more efficiently, reduce recurring fuel and operational costs and minimize waste in the supply chain.

In addition, better logistics efficiency opens opportunities to expand reach and meet customer needs more quickly. Better route optimization and inventory management can reduce delivery times and improve customer satisfaction. This has an impact on the company's positive reputation and higher customer loyalty. The adoption of green logistics practices also has a long-term impact on the company. By reducing greenhouse gas emissions, waste, and energy use, companies are contributing to wider environmental protection. This not only creates benefits for companies and customers but also promotes sustainable economic growth.

Overall, green logistics provides significant opportunities for businesses. Integrating sustainability principles into supply chain management not only reduces negative impacts on the environment but also improves operational efficiency, reduces costs, and strengthens corporate image. By adopting these sustainable

practices, companies can achieve short-term success and build a strong foundation for long-term growth.

3. Impact of Regulations and Institutional Changes

Government regulations and policies have a central role in directing change toward sustainable practices in business transportation. When regulations are introduced or tightened to reduce environmental impact, companies tend to respond by adopting more environmentally friendly transport practices. Regulations can provide incentives for companies to change their operational policies and procedures to meet more stringent legal requirements.

Emission and environmental standards imposed by governments have a direct impact on business transport practices. When governments set emission limits or require the use of sustainable technologies, companies must invest in appropriate solutions. Compliance with these standards forces companies to formulate more efficient and environmentally friendly transportation strategies. In some cases, governments also provide financial incentives for companies that adopt green technologies, encouraging positive changes in business practices.

Institutional changes, at both government and industry levels, have the potential to accelerate the adoption of sustainable transport initiatives. For example, industry associations or advocacy groups that promote sustainability can stimulate collaboration between companies and promote sustainable practices as an industry norm. In addition, cooperation between the public and private sectors can produce effective sustainable programs, such as the development of electric vehicle recharging infrastructure.

In many cases, institutional changes can also affect existing regulations and policies. As institutions change, sustainability priorities may become more recognized and championed. This could result in bold steps to reduce fossil fuel subsidies, encourage clean technology research, and build a more holistic framework for sustainable transport. Sometimes, challenges arise when companies are faced with rapid or inconsistent regulatory changes. A company's ability to plan long-term investments and develop sustainable strategies can be affected by regulatory uncertainty. However, a positive response to these institutional and regulatory changes can create opportunities for business innovation and differentiation.

In this context, companies need to develop flexibility and readiness in dealing with regulatory changes that may occur. They can also play a role in advocacy and collaboration with government agencies and industry to help shape wiser regulation and support sustainable change. The importance of collaboration between companies and government, as well as support from other institutional institutions, should not be overlooked. Having dialogue and coordination between the public and private sectors is key to creating a business environment that supports and promotes sustainable transport initiatives. The shared goal of reducing environmental impact while sustaining economic growth enables mutually beneficial cooperation.

It can be said that the role of regulation and institutional change cannot be ignored in the effort to achieve sustainable transportation. Rigorous regulations and positive institutional changes have great potential to trigger the adoption of sustainable business practices. However, challenges in dealing with regulatory

uncertainty also need to be overcome with readiness, flexibility, and active participation in policy formation. Collaboration between the public and private sectors forms a strong foundation for designing solutions that have a positive impact on the environment and the economy.

4. Case Study: Application of Green Logistics in the Transportation Business

FedEx, a global logistics company known for its fast and reliable services, has been a pioneer in adopting green logistics practices. They realize that sustainable business growth must be balanced with environmental responsibility. FedEx makes green logistics a key commitment and integrated it into its operational strategy. FedEx takes a comprehensive approach to integrating green logistics practices. They invest in electric and hybrid vehicle fleets and implement sophisticated route management systems. This technology helps optimize delivery routes based on traffic and weather conditions, reducing travel time and fuel consumption.

The implementation of green logistics brings positive results for FedEx. Optimizing routes and using environmentally friendly vehicles results in reduced operational and fuel costs. In addition, higher operational efficiency reduces delivery times and meets customer expectations. The application of green logistics also helps FedEx in reducing its environmental impact. The use of environmentally friendly vehicles contributes to reducing greenhouse gas emissions and air pollution. In addition, FedEx is committed to using more sustainable packaging and optimizing in-vehicle space to reduce waste and fuel consumption.

In the journey of adopting green logistics, FedEx faced several challenges. The initial investment in an eco-friendly vehicle fleet and route management technology can be a financial drag. Moreover, creating awareness and understanding among employees and customers about the benefits of green logistics is a challenge that needs to be overcome. FedEx addresses these challenges with a sustainable approach. They allocate resources for investments in sustainable technologies and communicate effectively to customers about the environmental benefits of green logistics practices. Corporate leaders play a role in leading by example and ensuring that all levels of the organization are involved in this ongoing initiative.

A FedEx case study shows that large companies can be successful in implementing green logistics. This comprehensive approach of integrating technology and sustainable practices has a positive impact on operational efficiency, cost reduction, and environmental impact reduction. While challenges exist, companies' commitment to sustainability and cross-sectoral collaboration are helping them overcome obstacles and build a more sustainable future.

E. CONCLUSION

In the current business context, implementing sustainable transportation and green logistics has become imperative for companies committed to sustainability. The negative impact of conventional transportation on the environment and natural resources underscores the need for a paradigm shift in transportation management. By optimizing routes, using sustainable technologies, and reducing emissions, businesses can strike a balance between economic growth and environmental responsibility. Real case studies from companies like FedEx confirm that green

logistics is not a concept per se, but can be implemented effectively on a larger scale. By adopting innovative technologies, intelligent route management, and eco-friendly vehicles, companies can reduce operational costs, increase efficiency and significantly reduce environmental impact. Despite challenges such as initial investment and changing habits, the success of companies like FedEx proves that collaboration, awareness, and changes in regulation can help overcome these barriers. Sustainable transportation and green logistics are not only a moral responsibility, but also a strategic opportunity for future businesses. By integrating sustainability initiatives into operations, benefiting from regulatory and institutional changes, and learning from real company case studies, businesses can achieve long-term sustainability while sustaining economic growth and supporting the environment.

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