



e-ISSN:2582-7219



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 7, Issue 5, May 2024



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.521



6381 907 438



6381 907 438



ijmrset@gmail.com



www.ijmrset.com



Green Logistics Sustainable and Eco- friendly Transportation Practices

Prince Singh, Dr. S. Maria Antonyraj, Rishav Shrivastav

MBA, Department of Supply Chain & Operation Management, NIMS University, Jaipur, Rajasthan, India

Associate Professor, NIMS University, Jaipur, Rajasthan, India

MBA, Department of Marketing & IT, NIMS University, Jaipur, Rajasthan, India

ABSTRACT: The goal of this study is to better understand the factors implementing eco-friendly practices in transportation to reduce environmental impact. Well, understanding of factors may not lead to the implementation of eco-friendly practices. The COP26 resolution to achieve carbon neutrality till 2050. The logistics and transportation industry contributes more to global greenhouse gas emission. Government and organization strategies analyze if the problem is genuine or not for the public. This study finds and investigates some elements that have a substantial impact on the green logistics and eco-friendly business practices. Making aware to the public as well as logistics industry about green logistics and eco-friendly technology is the future. Electric vehicles and other fuels option should be the problem-solving of logistics industry as well as for the people which they are facing. Make electric vehicles and other green packing method or fuels on the trial stage and gather feedback from the pilot audience that the green logistics is solving the problem you identified. Data was collected through the customer survey. Using technology that is easily operated and that focuses on environmental impact of logistics transportation. green and sustainable eco-friendly transports help reducing cost and dependency on fuels like petrol diesel etc. green logistics helps in the economic growth that will help the logistics provider and people of that area to be developed. it presents the split routing optimization problem of low-carbon distribution with the optimization goal of reducing carbon emissions. The study shows how to tackle the problem, and end with a conclusion to appeal the industry to start the green journey now.

KEYWORDS: Green logistics, Eco-friendly, Routing optimization, Carbon emission, Economic Growth, Sustainable.

I. INTRODUCTION

Green logistics, also known as sustainable logistics, focuses on reducing the environmental impact of transportation and supply chain operations while optimizing efficiency and cost-effectiveness. It encompasses various eco-friendly practices aimed at minimizing energy consumption, emissions, and waste throughout entire logistics process. Here are some key aspects of green logistics:

1.Introduction to Environmental Issues: Begin by discussing the global environmental challenges we face, such as climate change, air pollution, and resource depletion. Highlight the role of transportation in contributing to these issues through emissions, fuel consumption, and other environmental impacts.

2.Rise of Green Logistics: Provide an overview of the concept of green logistics, which emphasizes reducing the environmental impact of logistics activities. Discuss the growing awareness among businesses and consumers about the importance of sustainability in supply chain management.

3.Importance of Sustainable Transportation: Explore why sustainable transportation practices are crucial. This could include reducing greenhouse gas emissions, minimizing dependence on fossil fuels, improving air quality in urban areas, and mitigating the environmental impact of freight transport.

II. NEED AND SIGNIFICANCE OF THE STUDY

The need for research on green logistics, sustainable, and eco-friendly transportation practices is pressing for several reasons:

1. Environmental Impact: The transportation sector is a major contributor to environmental degradation, accounting for a significant portion of global greenhouse gas emissions, air pollution, and habitat destruction. As concerns about



climate change and environmental sustainability escalate, there's a critical need to identify and implement strategies to reduce the environmental footprint of transportation activities.

2. Resource Conservation: Transportation relies heavily on finite resources such as fossil fuels. With the depletion of these resources and the volatility of energy market. Research in this area can help identify alternative fuels, energy-efficient technologies, and innovative transportation solutions to reduce resource consumption and dependency.

3. Regulatory Pressures: Governments and regulatory bodies worldwide are implementing stricter environmental regulations and emissions standards to address climate change and air quality concerns. Businesses operating in the transportation and logistics industry must comply with these regulations while striving to minimize their environmental impact. Research can help inform policymakers about the effectiveness of existing regulations and identify areas for improvement or additional intervention.

III. LITERATURE REVIEW

Leung, T. C. H., Guan, J., & Lau, Y. (2023, June 13). In this paper, the authors examined management attitude and awareness towards green logistics, explores the external conditions that drive and restrict its positive behaviour, investigates the level of its adoption amongst logistics service providers (LSPs) and determines the major barriers affecting its application in the industry.

Jarašūnienė, A., & Bazaras, D. (2023, March 28). In this article, the authors present an analysis of academic literature in an attempt to identify the importance of the implementation of green logistics in road transportation and present areas of concern as well as solution and implementation opportunities.

Al, D. G. R. E. (2023, April 7). In this article, a systematic review is presented to recognize the contribution of the research that has been carried out regarding environmental practices in business logistics and how efficient they are in practice, as well as their permanence and updating over time.

Rosano, M., Cagliano, A. C., & Mangano, G. (2022, December 1). In this paper, a questionnaire survey is administered to Logistics Service Providers (LSPs) operating in the Italian market to investigate the perception of LSPs about the environmental issues and their willingness of pursuing future green strategies.

Hernandez, A. A., Escolano, V. J. C., Juanatas, R., & Elvambuena, M. D. E. (2022, May 19). In this article, the authors explored the green logistics practices of SMEs in the Philippines using a qualitative approach, and found that SMEs work with suppliers and customers, which is directed to improve operational benefits and reduce the impact on the environment.

Maurya, A., Padval, B., Kumar, M. P. R., & Pant, A. (2023, July 4). In this paper, the authors provide a conceptual framework for green logistics that will apply to the logistics activities carried out by the Indian manufacturing industry (oil and gas) and the impact they have on economic and environmental performance.

Vienažindienė, M., Tamulienė, V., & Zaleckienė, J. (2021, November 10). this paper, the authors present a theoretical conceptual model for applying green logistics practices to sustainable development and assess the expression of GL practices and their determinants in Lithuanian transport and logistics services companies.

IV. OBJECTIVES OF THE RESEARCH

1. Analyzing current logistics and transportation practices to understand their environmental impact. This involves studying transportation modes, vehicle types, route optimization, and packaging materials used.

2. Eco-friendly supply chains, implementing reverse logistics for recycling and reusing materials, and promoting modal shifts to greener transport modes.

V. HYPOTHESIS

H₀: There is no significant current logistics and transportation practices to understand their environmental impact.



H₁: There is a significant current logistics and transportation practices to understand their environmental impact

H₀: There is no significant Eco-friendly supply chains, implementing reverse logistics for recycling and reusing materials, and promoting modal shifts to greener transport modes.

H₁: There is a significant eco-friendly supply chains, implementing reverse logistics for recycling and reusing materials, and promoting modal shifts to greener transport modes.

VI. SCOPE OF THE STUDY

The scope of this study on Green logistics sustainable and Eco -friendly transportation practices from following aspects: -

Environmental Impact Assessment: Analysis of the environmental impact traditional transportation and logistics practices that includes carbon emissions, air and water pollution etc.

Green Technology and Innovation: The study examines research and develop eco- friendly transportation technologies such as electric vehicles, hydrogen fuel cells, biofuels, and green warehousing.

Supply Chain Management: the study focus on Investigating sustainable supply chain practices, including sustainable sourcing of materials, green procurement strategies.

Collaborative Partnerships on: THE study focus Exploring collaborative partnerships between businesses, government agencies, non-profit organizations, and academic institutions to promote knowledge sharing, technology transfer, and collective action toward sustainability goals in transportation and logistics.

Policy and Regulation: The scope of study examines the government policies, regulations, and incentives aimed at promoting sustainable transportation and logistics practices, such as emissions standards, fuel taxes, subsidies for green technologies, and infrastructure investments.

VII. RESEARCH METHODOLOGY

RESEARCH DESIGN

Designing research in the context of green logistics and sustainable transportation practices involves careful planning to address specific objectives and hypotheses while considering the complexities of environmental and logistical systems.

TYPES OF DATA COLLECTION

Primary Data: Primary data are those, which were collected afresh & for the first time and thus happen to be original in character.

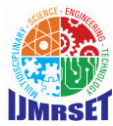
- Questionnaire

Secondary data: Secondary data is collected from previous research and literature to fill in the respective project. The secondary data was collected through:

- Articles
- Websites

Sample size: 63

Analysis Technique: Random Sampling and Questionnaire technique selected by researcher to collect the data from the respondent.



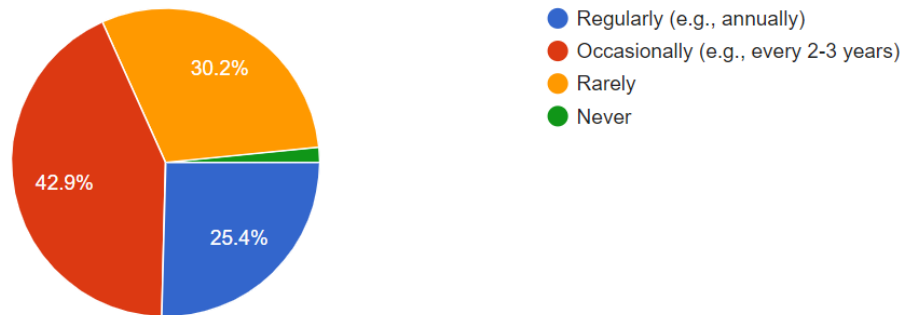
VIII. DATA ANALYSIS & INTERPRETATION

How often does your organization conduct assessments or audits to measure the environmental impact of its logistics and transportation operations?

Response	Frequency	Percentage
Regularly (e.g., annually)	16	25.4
Occasionally (e.g., every 2-3 years)	27	42.9
Rarely	19	30.2
Never	1	1.6
Total	63	100

Survey Report

63 responses



Analysis

From the above graph and table, it is observed that out of 63 responses, 16 respondents are very familiar with 30.2%, 27 respondents are with occasionally with 40.9%, 19 respondents are with rarely 25.4 %, 1 respondent are never with 1.6% about the does your organization conduct assessments or audits to measure the environmental impact of its logistics and transportation operations.

Interpretation

It is observed that most of the respondents are with occasionally and the least number of respondents belong to the never.

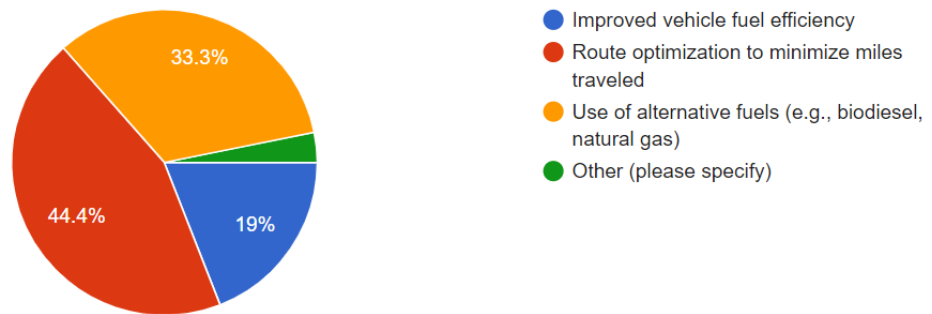
What measures has your organization implemented to reduce carbon emissions and promote energy efficiency in its transportation activities?

Response	Frequency	Percentage
Improved vehicle fuel efficiency	12	19
Route optimization to minimize miles traveled	28	44.4
Use of alternative fuels	21	33.3
Other (please specify)	2	3.2
Total	63	100



Survey Report

63 responses



Analysis

From the above graph and table, it is observed that out of 63 responses, 12 respondents are with improved vehicles fuels efficiency 19%, 28 respondents are with route optimization to minimize miles traveled with 44.4%, 21 respondents are use of alternative fuels with 33 %, 2 respondents are other with 3.2% about the organization implemented to reduce carbon emissions and promote energy efficiency in its transportation

Interpretation

It is observed that most of the respondents are with route optimization and the least number of respondents belong to the other.

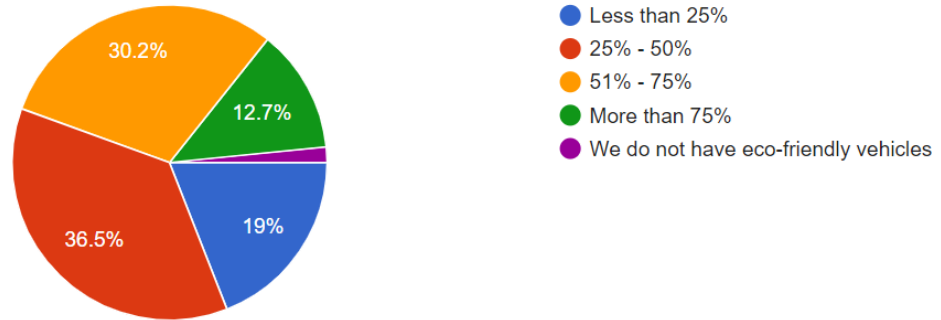
What percentage of your organization's transportation fleet consists of eco-friendly vehicles (e.g., electric, hybrid)?

Response	Frequency	Percentage
Less than 25%	12	19
25% - 50%	23	36.5
51% - 75%	19	30.2
More than 75%	8	12.7
We do not have eco-friendly vehicles	1	1.6
Total	63	100



Survey Report

63 responses



Analysis

From the above graph and table, it is observed that out of 63 responses, 12 respondents are less than 25% with 19%, 23 respondents are with 25%-50% at 36.5%, 19 respondents are with 51%-75% at 30.2, 8 respondents are more than 75% with 12.7% and 1 respondent at 1.6% do not have eco-friendly vehicles.

Interpretation

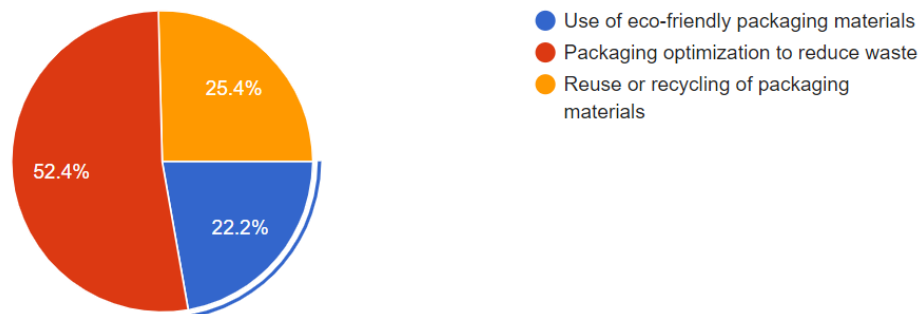
It is observed that most of the respondents are with 25%- 50% and the least number of respondents belong to the do not have eco-friendly vehicles.

How does your organization manage and minimize waste generated from packaging materials in transportation activities?

Response	Frequency	Percentage
Use of eco-friendly packaging materials	14	22.2
Packaging optimization to reduce waste	33	52.4
Reuse or recycling of packaging materials	16	25.4
Total	63	100

Survey Report

63 responses





Analysis

From the above graph and table, it is observed that out of 63 responses, 14 respondents are with Use of eco-friendly packaging materials with 22.2%, 33 respondents are with Packaging optimization to reduce waste with 52.4%, 16 respondents are with Reuse or recycling of packaging materials with 25.4%

Interpretation

It is observed that most of the respondents are with Packaging optimization to reduce waste and the least number of respondents belong to the Use of eco-friendly packaging materials.

IX. FINDINGS

- Operations in the logistics should be well occupied with sustainable and eco- friendly transportation modes.
- Logistics companies should be ready to bring green sustainable and eco- friendly mode of transportation.
- The organization maintain lack of knowledge about the eco- friendly vehicles.
- It is observed that most of the respondents are moderate leadership support and the least number of respondents belong to the no leadership support.
- Strategic decisions are mostly followed by organization are quite tough to implement.
- The excellence of facility and quality as ranked is good in future supply chain.
- It is observed that most of the respondents are very familiar.
- Future supply chain deals with excellence and use standard products so that it increases the company's profile and reputation.
- The activities and operations of 3PL logistics provider should be given preference and compete with them.

X. LIMITATIONS OF RESEARCH

The study was carried out within the stated parameters. Nevertheless, the research was limited.

- The focuses only on 63 respondents.
- This study is based on the information provided by the respondents.

XI. SUGGESTION & RECOMMENDATION

- If the logistics companies provide eco- friendly and sustainable modes of transport than it will increase not only their profit along with it they may save their fuel cost.
- All the logistics services provider should have proper knowledge about the green logistics.
- Some companies have a good number of eco- friendly mode of transportation, but a few of them don't use proper backup for it.
- If the logistics companies use other option like (e.g., electric, hybrid) rather than petrol or diesel.
- Conduct a regular survey of customers and vendors to determine whether their satisfaction level is meeting or not.
- With eco- friendly packing and on time delivery at an affordable price will increase the number of customers.
- Local government should support the logistics provider to get eco-friendly or low emission vehicles so that may generate less pollution and increase economic and also reduce the environment substances.

XII. CONCLUSION

In the study embracing green logistics is pivotal for fostering sustainable and eco-friendly transportation processes. By integrating environmentally conscious practices into logistics operations, such as optimizing route planning to minimize emissions, utilizing alternative fuels, and employing energy-efficient vehicles, companies can significantly reduce their carbon footprint. Additionally, adopting eco-friendly packaging materials and implementing efficient warehouse management practices further contribute to mitigating environmental impact.

the adoption of technology plays a crucial role in enhancing the sustainability of transportation processes. Implementing smart transportation systems, leveraging data analytics for optimization, and utilizing electric and hybrid vehicles are key strategies for achieving greener logistics operations. Collaboration among stakeholders, including governments, businesses, and consumers, is essential for driving systemic change towards sustainability in transportation.



REFERENCES

1. Jarašūnienė, A., & Bazaras, D. (2023, March 28). The Implementation of Green Logistics in Road Transportation. *The Baltic Journal of Road and Bridge Engineering*. <https://doi.org/10.7250/bjrbe.2023-18.594>
2. Seroka-Stolka, O., & Ociepa-Kubicka, A. (2019, January 1). Green logistics and circular economy. *Transportation Research Procedia*.
<https://doi.org/10.1016/j.trpro.2019.06.049>
3. Zhao, Z., Zhang, M., Xu, G., Zhang, D., & Huang, G. Q. (2020, February 3). Logistics sustainability practices: an IoT-enabled smart indoor parking system for industrial hazardous chemical vehicles. *International Journal of Production Research*. <https://doi.org/10.1080/00207543/bjrbe.2020-17.209>
4. Patra, P. K. (2018, June 1). Green Logistics: Eco-friendly measure in Supply-Chain. *Management Insight*.
<https://doi.org/10.21844/mijia.14-01.10>
5. Kurbatova, S. M., Aisner, L. Y., & Mazurov, V. Y. (2020, August 1). Green logistics as an element of sustainable development. *IOP Conference Series. Earth and Environmental Science*.
<https://doi.org/10.1088/1755-1315/548/5-052067>
6. Evangelista, P., Santoro, L., Hallikas, J., Kähkönen, A., & Lintukangas, K. (2019, January 1). *GREENING LOGISTICS OUTSOURCING: REASONS, ACTIONS AND INFLUENCING FACTORS*. *International Journal of Logistics Systems and Management*. <https://doi.org/10.1504/ijlsm.2019.10013331>
7. Agyabeng-Mensah, Y., Afum, E., Acquah, I. S. K., Dacosta, E., Baah, C., & Ahenkorah, E. (2020, December 10). *The role of green logistics management practices, supply chain traceability and logistics ecocentricity in sustainability performance*. *International Journal of Logistics Management*.
<https://doi.org/10.1108/ijlm-05-2020-0187>



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com