Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 04, April, 2026
Website: https://researchiapress.com

METHODOLOGY FOR IMPLEMENTING A GREEN LOGISTICS SYSTEM IN INDUSTRIAL ENTERPRISES AND EVALUATING ITS ECONOMIC EFFICIENCY

Begimqulova Gulhayo Bakhtiyorovna
Lecturer, Department of Social Sciences
Tashkent State Medical University
Tel: +998 90 670 70 55

Abstract
This article develops an integrated methodology for implementing a green logistics system in industrial enterprises and evaluating its economic efficiency. The study proposes an index that integrates economic, environmental, and operational indicators into a single system. In addition, methods are developed for calculating both the direct and indirect economic benefits of implementing a green logistics system. The proposed methodology facilitates efficient use of resources in industrial enterprises, reduces logistics costs, and ensures environmental sustainability, demonstrating that green logistics is effective not only environmentally but also economically.

Keywords: Green logistics, economic efficiency, environmental efficiency, logistics costs, integrated assessment, industrial enterprises.

Introduction

In the current context, improving the efficiency of logistics systems in industrial enterprises is becoming important not only from an economic perspective but also from an environmental standpoint. Traditional logistics systems are associated with high costs and large volumes of waste, which negatively affect the sustainable development of enterprises. Therefore, the implementation of the green logistics concept is becoming an urgent issue. However, practice shows that in existing approaches, the efficiency of green logistics is mainly assessed through economic indicators, while environmental factors are not sufficiently

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 04, April, 2026
Website: https://researchiapress.com

taken into account. This can lead to incorrect conclusions in the decision-making process.

Issues related to green logistics have been studied and continue to be explored by many foreign and domestic scholars. According to their research, reducing the environmental impact of logistics systems, optimizing transportation costs, and ensuring efficient use of resources are among the most important key factors. Logistics activities are one of the significant sources of CO_2 emissions on a global scale. At the same time, modern studies demonstrate that the implementation of a green logistics system can reduce costs and increase efficiency.

To evaluate the economic efficiency of implementing a green logistics system in industrial enterprises, the application of a comprehensive and integrated approach can be based on combining economic, environmental, and operational indicators into a single system. The methodology presented in the article was developed based on methods of system analysis, comparison, statistical evaluation, and economic modeling.

To determine the effectiveness of green logistics, the indicators were divided into three main groups:

Economic indicators: transportation costs (TC), logistics costs (LC)

Environmental indicators: carbon emissions (CO_2), fuel consumption (F)

Operational indicators: delivery time (T), logistics losses (L)

The selection of these indicators is explained by their significance in industrial logistics and their measurability.

To enable the comparison of indicators measured in different units, they are normalized. Normalization is carried out by subtracting the minimum value of each indicator from its actual value, and then dividing the result by the difference between the maximum and minimum values. This method allows all indicators to be scaled to a range between 0 and 1 and ensures their evaluation within a unified system.

To account for the relative importance of the indicators, weight coefficients are assigned to them. The following distribution is applied:

economic indicators

environmental indicators

operational indicators

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 04, April, 2026
Website: https://researchiapress.com

These weights are determined using the expert assessment method and are assigned in accordance with the main goal of green logistics – harmonizing economic and environmental efficiency.

To determine the overall effectiveness of the green logistics system, an integrated index is proposed:

$$\mathbf{GLEI} = \sum(\boldsymbol{w_i} \cdot \boldsymbol{X_i})$$

where:

Wi–weight of the indicator

X_i– normalized value of the indicator

This index allows for a comprehensive assessment of an industrial enterprise's logistics system and simplifies the decision-making process.

The economic efficiency of implementing a green logistics system is evaluated in two stages:

Basic economic efficiency model:

$$E = (C_{\text{old}} - C_{\text{new}}) - I$$

where:

C_{old}– costs before implementation

C_{new}– costs after implementation

I– investment amount

Extended economic efficiency model:

$$E_{\text{total}} = E_{\text{direct}} + E_{\text{indirect}} + E_{\text{eco}}$$

where:

E_{direct}– direct economic benefits

E_{indirect}– savings in time and resources

E_{eco}– benefits resulting from environmental efficiency

This model allows for a more comprehensive assessment of green logistics efficiency.

The proposed approach creates a systematic basis for evaluating logistics processes by integrating economic, environmental, and operational indicators into a single system. Implementing the green logistics concept enables enterprises

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 04, April, 2026
Website: https://researchiapress.com

to use resources more efficiently, optimize logistics costs, and reduce environmental impact. At the same time, unlike traditional evaluation methods, the proposed methodology allows for a comprehensive assessment of various aspects of logistics activities.

Based on the integrated assessment indicator (GLEI), it is possible to determine the overall efficiency of an enterprise's logistics system and apply a scientifically grounded approach when making various management decisions. Furthermore, the developed extended economic efficiency model demonstrates that both the direct and indirect results of implementing a green logistics system can be evaluated.

References:

1. Qodirov, O. (2019). Ecological Sustainability and Green Economy in Industrial Enterprises. Tashkent: "Fan va Texnologiya" Publishing.
2. Usmonov, B., Toshpo'latov, S. (2020). Methods for Optimizing Logistics Systems. Tashkent: "Iqbol" Publishing.
3. Abdullayev, D. (2018). Green Logistics and Efficient Resource Utilization. Uzbekistan Economy Journal, №4, 23–32.
4. Normatov, J. (2021). Methodology for Evaluating Environmental Indicators in Industrial Enterprises. Tashkent: "Ilm" Publishing.
5.Tursunov, A. (2017). Energy Efficiency and Green Transport in Enterprises. Technology and Innovation Journal, №2, 45–53.
6.Mamatqulov, F. (2020). Evaluating Economic Efficiency and Logistics Systems. Business and Economy Journal, №6, 12–21.
7.Rasulov, E., Sultonov, H. (2019). Methods for Ensuring Environmental Sustainability in Enterprise Logistics. Uzbekistan Economy and Management Journal, №3, 7–15.
8. Xolboyev, N. (2018). Modernization of Transport Systems in Industrial Enterprises. Scientific Information Journal, №5, 34–42.
9. Center for Economic Research under the President of the Republic of Uzbekistan. (2021). Transition of Uzbekistan's Industry to a Green Economy: Analysis and Recommendations. Tashkent: Center for Economic Research.
10.Mirzaqulov, A. (2020). Green Economy and Enterprise Resource Management. Tashkent: "Fan va Texnologiya" Publishing.