

GREEN LOGISTICS IN CENTRAL ASIA: ENVIRONMENTAL SUSTAINABILITY AND INNOVATIVE SOLUTIONS

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Abstract: This article analyzes the concept of green logistics and approaches aimed at enhancing its positive environmental impact and implementing sustainable transport operations. Green logistics exhibits significant terminological differences between Uzbek and English, creating various challenges in translation processes. The article presents terms related to carbon emission reduction, energy conservation, sustainable packaging, and waste management practices, analyzing their translations and equivalents in Uzbek and English. Additionally, the essence of environmentally responsible logistics approaches and opportunities for developing this field are examined.

Keywords: green logistics, eco-logistics, sustainable logistics, carbon emissions, energy-efficient transport, more sustainable packaging, carbon footprint, contextual translation, scientific and technical translation.

Annotatsiya: Ushbu maqolada yashil logistika tushunchasi, uning atrof-muhitga ijobiy ta'sirini oshirish va barqaror transport operatsiyalarini joriy etishga qaratilgan yondashuvlar tahlil qilinadi. Yashil logistika o'zbek va ingliz tillarida keng qamrovli terminologik farqlarga ega bo'lib, tarjima jarayonlarida bir qator muammolarni keltirib chiqaradi. Maqolada uglerod chiqindilarini kamaytirish, energiya tejash, barqaror qadoqlash va chiqindilarni boshqarish amaliyotlari bilan bog'liq terminlar keltirilib, ularning o'zbek va ingliz tillaridagi tarjimasini va ekvivalentlari tahlil qilinadi. Shuningdek, ekologik jihatdan mas'uliyatli logistika yondashuvlarining mohiyati va ushbu sohani rivojlantirish imkoniyatlari ko'rib chiqiladi.

Kalit so'zlar: yashil logistika, eko-logistika, barqaror logistika, uglerod chiqindilari, energiya tejamkor transport, barqaror qadoqlash, uglerod izi, kontekstual tarjima, ilmiy-texnik tarjima.

Аннотация: В данной статье анализируется концепция «зеленой логистики» и подходы, направленные на усиление ее положительного воздействия на окружающую среду и внедрение устойчивых транспортных операций. Терминология «зеленой логистики» в узбекском и английском языках значительно различается, что создает различные проблемы в процессе перевода. В статье представлены термины, связанные с сокращением выбросов углерода, энергосбережением, устойчивой упаковкой и практиками управления отходами, а также проанализированы их переводы и эквиваленты в узбекском и английском языках. Кроме того, рассмотрена суть экологически ответственных подходов к логистике и возможности развития этой области.

Ключевые слова: зеленая логистика, экологическая логистика, устойчивая логистика, выбросы углерода, энергоэффективный транспорт, более устойчивая упаковка, углеродный след, контекстуальный перевод, научно-технический перевод.

Introduction

Today, global climate change and environmental concerns are placing new demands and tasks before the logistics sector. The concept of "green logistics" or "eco-logistics" involves

seeking and implementing environmentally significant solutions in logistics processes. Green logistics primarily focuses on reducing carbon emissions in transportation and supply chains, achieving energy efficiency, and applying sustainable packaging methods. Green logistics is considered one of the environmental strategies aimed at mitigating global climate issues. In the Central Asian region, green logistics is particularly important, as this area has an economy dependent on natural resources and faces a significant need for environmental protection. This field is developing in three main directions:

1. Reduction of carbon emissions

Reducing carbon emissions is one of the most important priorities in the transport sector, and the following technologies and approaches are used in this process:

- **Electric vehicles:** Electric trucks and electric cars can significantly reduce carbon emissions (Dekker, Bloemhof & Mallidis, 2012 p. 671-679). Central Asian countries, including Uzbekistan, are investing in this sector by implementing subsidies for electric vehicles.
- **Hybrid fuel systems:** Vehicles using diesel and electric power are considered more efficient.
- **Increasing fuel efficiency:** Aerodynamic designs, lightweight materials, and high-tech engines can reduce fuel consumption.
- **Joint cargo transportation systems:** Uzbekistan, in collaboration with neighboring countries, strives to make transit cargo transportation processes more environmentally efficient by optimizing freight routes.

Green Logistics: A Sustainable Future for Central Asia

As environmental concerns grow worldwide, the logistics industry is undergoing a transformation toward sustainability. Green logistics is not just about reducing fuel consumption in transportation; it also encompasses sustainable packaging, waste management, and efficient supply chain operations. In Central Asia, where economic development is closely tied to natural resources, the adoption of green logistics principles is becoming increasingly essential. By integrating innovative solutions, businesses and governments can mitigate environmental damage while improving efficiency and reducing costs.

One of the key aspects of green logistics is sustainable packaging and waste management. Traditional packaging materials, particularly plastics, contribute significantly to pollution. To address this issue, companies are increasingly shifting toward recyclable alternatives such as cardboard, glass, and biodegradable materials. While these eco-friendly options are being adopted, the recycling industry in Central Asia is still in its early stages and requires further investment and infrastructure development (Mukhtarov, 2021, p. 122-136). Another effective strategy is minimizing excessive packaging, which not only reduces waste but also optimizes the use of resources (Sbihi & Eglese, 2010, p. 99-116). Furthermore, optimizing production by using recycled materials plays a crucial role in waste reduction. Recycling initiatives in Kyrgyzstan and Tajikistan are actively working to develop sustainable waste management systems, though further improvements are needed.

Another critical component of green logistics is optimizing transport routes to reduce fuel consumption and emissions. The use of GPS and IoT technologies is revolutionizing logistics by enabling smart distribution of cargo. By analyzing traffic patterns and choosing the most efficient routes, companies can significantly cut down on fuel usage and delivery time. Additionally, blockchain technology is enhancing transparency in supply chains, allowing

businesses to track and verify shipments securely and ensuring accountability throughout the transportation process (Sarkis, 2012). Another approach to improving efficiency is joint transportation of goods, where companies maximize vehicle space to avoid half-empty trucks on the road. This method not only conserves resources but also minimizes the number of vehicles required for transportation, leading to a substantial reduction in emissions.

To fully implement green logistics principles in Central Asia, strategic measures must be adopted at both corporate and governmental levels. Developing a green logistics policy is essential for creating a framework that supports sustainable transportation and packaging solutions. Governments must also consider implementing environmental tax systems to discourage unsustainable practices. By imposing additional taxes on businesses that contribute to environmental degradation, policymakers can encourage industries to adopt greener alternatives. At the same time, embracing innovative technologies such as IoT, blockchain, and GPS can drive efficiency and reduce emissions across supply chains. Another crucial aspect is overcoming language and technical barriers by creating industry-specific terminology guides (Bozorbekov, 2022), ensuring that sustainability efforts are well-communicated and effectively implemented.

Green logistics is no longer just a trend—it is a necessity for sustainable economic growth. By embracing eco-friendly packaging, optimizing transportation routes, and integrating advanced technologies, businesses and policymakers in Central Asia can build a more sustainable and efficient logistics system. These efforts will not only protect the environment but also enhance operational effectiveness, positioning the region as a leader in sustainable logistics on the global stage.

CONCLUSION

Green logistics not only allows for solving environmental problems but also achieving economic efficiency and creating a system that meets international standards. In Central Asia, a significant contribution to environmental protection can be made through the correct translation of green logistics terms, the widespread introduction of ecological transport, and sustainable packaging methods.

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