водопостачання в с. Молниця та Могилівка; ж) роздільний збір і сортування ТПВ в населених пунктах громади

Загалом проведене дослідження дало можливість зробити висновок, що за рівнем та обсягами проведених фахових оціночних робіт екологічного спрямування Україна відстає від країн ЄС. А це приводитьдо того, що вивчення перспетив екологічного становища територій часто відбувається лишень на рівні розробки планів, переважно на основі різноманітних екстраполяцій та експертних висновків. Також існують недоліки у при проведенні оцінки стану навколишнього середовища як комплексно, так і на рівні його окремих компонентів. Застосовувані підходи, не завжди є адаптованими для одержання та обґрунтування планувальних рішень, а часто просто не висвітлюються широкому загалу розробників містобудівної документації. Також процеси діджиталізації в управлінській діяльності та життєдіяльності суспільства значно підвищили актуальність технологічної складової планувального процесу. Чітко окреслюється тенденція щодо необхідності автоматизації та стандартизації СЕО. Одним із кроків на шляху вирішення цієї проблеми є їх створення на базі геоінформаційних технологій (ГІС), які враховували б особливості природи та екологічний стан. Тому вважаємо за доречне використання ГІС-технологій на таких етапах, як організація даних, попереднього аналізу під час визначення обсягу СЕО, оцінювання стану навколишнього середовища, аналізі проектних рішень, аналізі альтернативних проектних рішень.

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ECO-LOGISTICS AS A TOOL FOR SUSTAINABLE DEVELOPMENT OF TERRITORIAL COMMUNITIES

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The article explores the role of eco-logistics in promoting the sustainable development of territorial communities. Environmentally friendly logistics practices in agriculture can help reduce emissions, optimize resources, and support local economies. Based on European and Greek experiences, the paper outlines practical steps for introducing eco-logistics into rural territories.

Key words: *eco-logistics, sustainability, territorial communities, agriculture, supply chains*

Introduction. Rural and territorial communities are at the heart of Europe's sustainable transformation. They face multiple challenges such as population decline, limited access to markets, and environmental degradation. Logistics – the organization of transport, storage, and distribution — is a crucial but often overlooked factor influencing both the economy and the environment of these communities.

Eco-logistics, or sustainable logistics, integrates environmental principles into logistics systems by reducing emissions, energy use, and waste generation. This approach is particularly relevant for agriculture, where transport and packaging significantly affect both the cost of products and the ecological footprint of production. Implementing eco-logistics solutions can therefore become an important driver of sustainable territorial development.

Eco-logistics in the European and Greek Context: the European Union has set ambitious goals for the decarbonization of transport and agriculture, as reflected in the European Green Deal and the EU Agricultural Outlook 2023–2035 [3]. These initiatives promote energy efficiency, innovation, and circular economy models across value chains.

In Greece, agriculture remains a vital sector, and the logistics industry plays an essential role in ensuring the competitiveness of agri-food products. Studies show that improved logistics coordination, digitalization, and cooperative models can significantly reduce environmental impact and logistics costs [1; 5]. The Agricultural University of Athens actively contributes to this process through research and education in sustainable supply chain management [2].

Key Elements of Eco-Logistics for Rural Development

Eco-logistics involves several interconnected components that together enhance sustainability at the community level:

– Efficient Transport Systems. Optimizing transport routes, consolidating shipments, and using alternative fuels or electric vehicles reduce emissions and costs.

– Local Aggregation Hubs. Establishing collection centers for agricultural products allows small producers to combine loads, improve delivery reliability, and access larger markets.

– Digital Tools and Planning. Simple digital platforms can help coordinate transport schedules and monitor supply chains, preventing unnecessary trips and food losses.

Education and Training. Increasing awareness among farmers and logistics professionals is essential for adopting eco-friendly methods.

These actions are relatively low-cost and can be gradually introduced in small communities, especially where cooperatives or local authorities are willing to cooperate.

Practical Implementation and Expected Benefits: the first step toward implementing eco-logistics is a diagnostic analysis of local transport flows and resource use. Mapping agricultural production and existing logistics routes helps identify areas where consolidation or route optimization can bring the greatest benefits.

Pilot projects can then be developed through cooperation between local governments, universities, and producer associations. For example, setting up a shared distribution hub can reduce the number of trips and fuel consumption while increasing delivery efficiency. Another step is the gradual introduction of eco-friendly transport – electric or hybrid vehicles for short distances, or biofuel-powered trucks for longer ones.

In the Greek context, eco-logistics can be especially beneficial in agricultural regions such as Thessaly, Crete, and the Peloponnese, where small and medium-sized farms dominate. Implementing sustainable logistics solutions here would not only lower emissions but also create new employment opportunities and support rural resilience.

The environmental and economic benefits of eco-logistics include:

– reduction of CO_2 emissions and air pollution;

– lower transport and storage costs;

– decrease in food waste through better coordination;

– improved access to urban markets for small producers;

– strengthened cooperation within territorial communities.

These effects contribute directly to the goals of sustainable development and align with European Union policies on climate neutrality and rural development [3; 4].

Challenges and Policy Recommendations: despite its potential, the adoption of eco-logistics faces several obstacles. Small producers often lack financial resources and technical expertise. Limited awareness and insufficient cooperation between farmers, transport companies, and local authorities also slow progress.

To overcome these barriers, a comprehensive and collaborative approach is essential. First and foremost, it is crucial to enhance the digital and technical competence of local businesses and authorities by providing targeted training programs and continuous technical support through universities, research institutions, and local development agencies [1]. Such educational initiatives can help build the necessary skills to implement sustainable logistics systems and innovative technologies. Furthermore, public–private partnerships should be actively encouraged to attract investment in logistics infrastructure, renewable energy sources, and green transport networks [2]. Cooperation between local governments, private investors, and European organizations can accelerate the modernization of transport systems, ensuring that rural regions are not left behind in the green transition.

In addition, introducing well-structured incentives and subsidies can play a key role in motivating enterprises to adopt eco-logistics practices [3]. These may include tax benefits, grants, or preferential financing under EU and national rural development programs aimed at sustainability and innovation [4]. By supporting small and medium-sized enterprises in integrating renewable energy, optimizing supply chains, and reducing emissions, such measures would create a multiplier effect that strengthens both environmental and economic resilience. Ultimately, a coordinated effort that combines education, investment, and policy incentives will make the transition toward sustainable logistics in rural areas not only achievable but also beneficial for long-term regional development [6]. Integrate digital tools for logistics coordination at the community level.

Conclusion. Eco-logistics represents a practical and interdisciplinary tool for achieving sustainable development in territorial communities. By optimizing transport, reducing waste, and promoting cooperation between producers, logistics companies, and local authorities, it strengthens both the economy and the environment.

In Greece and across Europe, eco-logistics can transform rural territories into models of green transition. The experience and research potential of the Agricultural University of Athens and similar institutions provide a strong foundation for pilot projects, education, and the dissemination of best practices. Implementing eco-logistics on a wider scale will contribute to environmental protection, rural employment, and the competitiveness of local economies — essential elements of sustainable territorial development.

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