

EVALUATION OF ECO-INNOVATIONS AND THE ECO-INNOVATION INDEX AND THEIR IMPORTANCE IN THE FOOD INDUSTRY

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Keywords: eco-innovation, eco-innovation index, food industry

JEL Classification: L66, Q55

1 INTRODUCTION

Eco-innovation is a crucial driver of sustainability, integrating environmental considerations into business practices while enhancing resource efficiency [1, 3]. The adoption of eco-innovations is influenced by regulatory frameworks, institutional pressures, and consumer demand for sustainable products [6]. One of the key tools for assessing eco-innovation performance in Slovakia and across the EU is the Eco-Innovation Index (EII), which evaluates five dimensions: inputs, activities, outputs, resource efficiency, and socio-economic outcomes [5]. In the food industry, eco-innovation plays a critical role in reducing environmental impact, improving product quality, and enhancing supply chain transparency [4]. However, challenges such as financial constraints and technological limitations hinder its wider implementation [2].

2 MATERIAL AND METHODS

This research paper analyses the development of the eco-Innovation Index in Slovakia and its position relative to the EU average from 2015 to 2024. The research paper also examines the impact of eco-innovation in the Slovak food industry, focusing on key influencing factors. The primary data source includes publicly available databases on eco-innovation, sustainability, and the food industry. Statistical methods are used to compare trends, identify gaps, and evaluate progress in eco-innovation adoption.

3 RESULTS

The analysis of the eco-innovation index from 2015 to 2024 shows that Nordic countries (Finland, Sweden, Denmark) consistently lead in eco-innovation performance, while Slovakia ranks below the EU average, alongside countries like Greece, Romania, and Bulgaria. Despite an overall 54.5% increase in Slovakia's eco-innovation index over the decade, its value (98.9 in 2024) remains lower than the EU average (127.5). The highest year-on-year growth in Slovakia occurred in 2023 (+13.3%), while the most significant decline was in 2019 (-9.3%). Slovakia's eco-innovation performance is marked by high variability, reflecting challenges in maintaining consistent growth. In the food industry, eco-innovation contributes to increased sustainability through advancements in resource efficiency, food traceability,

and sustainable packaging (Tiekstra et al., 2021). However, disparities exist between small and large enterprises in implementing eco-innovative solutions. While larger companies invest in digitalization and green technologies, smaller enterprises struggle due to financial constraints. The food sector's modernization reflects ongoing investments in eco-innovative solutions, but further support is needed to enhance sustainability efforts.

4 CONCLUSIONS

The findings highlight Slovakia's gradual progress in eco-innovation, with improvements in certain dimensions but persistent challenges in investment and policy support. If the current growth rate (8–10% per year) continues, Slovakia could reach the EU average by 2030. However, stagnation or declining investment could defend this progress. The food industry remains a strategic area for eco-innovation, requiring targeted policies, financial incentives, and enhanced cooperation across supply chains. Future research should focus on effective policy frameworks and financial mechanisms to accelerate eco-innovation adoption, particularly in sectors with high environmental impact.

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Acknowledgement

Supported by the grant No. APVV-23-0022 of the Grant Agency APVV.

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