

IMPLEMENTING BIOENERRGY SOLUTIONS AMIDST GEOPOLITICAL INSTABILITY: A CASE STUDY OF SRI LANKA

**R. P. D. T. N. Chiranthu, S. D. Valentina Garcia,
A. – D. Rășinar, T. V. Vintilă, F. Morariu, E. C. Zoican***

University of Life Sciences “King Mihai I” from Timișoara, Romania

**e-mail: catalin.zoican@usvt.ro*

Abstract

This paper analyzes the 2026 fuel crisis in Sri Lanka as a case of energy vulnerability driven by dependence on imported fossil fuels and geopolitical instability. The study aims to evaluate the potential of biotechnology-based energy solutions in strengthening national energy resilience. The methodology is based on qualitative analysis of recent data, literature, and case-specific energy measures implemented during the crisis. The results highlight that decentralized bioenergy systems, such as biogas production, biomass valorization, and algae-based fuels, can partially substitute conventional fuels using locally available resources. However, technological and economic limitations restrict large-scale implementation in the short term. The study concludes that integrating bioenergy into national strategies offers a realistic pathway toward reducing external dependence, while its originality lies in linking geopolitical risk with biotechnology-driven energy solutions in the Sri Lankan context.

Key words: Bioenergy, Sri Lanka, Energy Crisis, Biotechnology, Sustainability