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"Gheorghe Asachi" Technical University of Iasi, Romania

OPTIMIZING THE ROLE OF AGRICULTURE IN BIOENERGY PRODUCTION THROUGH FOOD AND ENVIRONMENTAL SUSTAINABILITY: AN SEM-PLS APPROACH IN INDONESIA

Budianto[1]*, Anik Suparmi[2], Bahrun Borahima[3]

[1]Institute Sains &Teknologi Al-Kamal, Jakarta, Indonesia
[2]SMA Negeri 3 Tarakan, Tarakan City, North Kalimantan, Indonesia
[3]Sekolah Tinggi Ilmu Ekonomi Indonesia Malang, East Java – Indonesia

Abstract

The utilization of agricultural potential for bioenergy remains a contentious issue that affects food availability and environmental equilibrium. This research examiend the relationship between agriculture and bioenergy, specifically exploring how sustainability (in terms of food and the environment) mediates this connection. Data related to bioenergy, agriculture, and the environment across all provinces in Indonesia were collected through questionnaires distributed to government agencies as respondents. The structural equation model (SEM) in the form of Partial Least Square (PLS) was employed to assess the variables. The findingds revealead that agriculture did not have direct impact on bioenergy (β=0.078; T stat. <1.65; p>0.05). However, a significant infleunce was observed when mediated through sustainability (food and environment) (β=0.244; T stat. >1.65; p<0.05). Food and environmental sustainability enhanced the influence of agriculture on bioenergy by 14.6%. The results of the fit model assessment resulted in SRMR (Standardized Root Mean Square Residual) <0.07, NFI (Normed Fit Index) >0.9, and Goodness of Fit Index >0.36 values, showing that the model proposed in this research is proper. In conclusion, our research offers practical recommendations for enhancing bioenergy production by optimizing agricultural indicators in alignment with sustainability principles.

Key words: agricultural potential, biomass agriculture, environmental conservation, model-based strategy

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* Author to whom all correspondence should be addressed: e-mail: budianto_delta@yahoo.com