

ISTANBUL CONFERENCE ON ECONOMICS AND SOCIETY (ISTCES) 2025

*Pathways to Inclusive Growth: Overcoming Challenges in
Emerging and Developing African Countries.*

24-26 SEPTEMBER 2025

Book of Proceedings

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29.

Effects of Biomass Energy Extraction and Agricultural Land Use on Land Use Emission in Nigeria

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The harnessing of biomass energy resources and agricultural land expansion have consequences on land use emission. Both agricultural expansion and biomass energy production continue to drive land use change due to their direct connection to forestry. High demand for biomass to produce biofuel might cause agricultural expansion, leading to biodiversity reduction, degradation of soil quality and higher land use emission. On this background, the research examines the effects of biomass energy extraction and agricultural land use on land use emissions in Nigeria. The study compiles data from FAO and WDI and covers the 1990-2022 period. We employ fully modified ordinary least square (FMOLS) model with land use emissions as the dependent variable. Meanwhile, the explanatory variables include biomass energy extraction, hectares of agricultural land, and hectares of forest land. The findings establish that agricultural land use significantly amplify land use emission, while biomass energy extraction depress emissions from land use. However, the undesirable effect of agricultural land use dominates the mitigating effect of biomass energy extraction. Besides, forest land use has no significant effect on land use emissions. The results have implications for the Nigeria's drive towards sustainability. First, unsustainable agricultural practices hinder environmental sustainability, which leads to increased land use emissions due to agricultural land expansion. Second, extraction of biomass resources does not

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put much pressure on sustainability due to biomass carbon neutral status. Sustainable biomass energy production will facilitate emission mitigation and enhance sustainable environment. Therefore, the research recommends investments in sustainable agricultural production through public private partnership to align agricultural practices with sustainable land use.

Keywords: Biomass energy extraction, Agricultural land use, Land use emission, Sustainability.