

Title: Does foreign direct investment influence carbon emission-related environmental problems? Contextual evidence from developing countries across Sub-Saharan Africa

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Abstract: Sub-Saharan African nations face multifaceted environmental problems, especially those associated with carbon discharges. Hence, this study calculates a composite carbon index in the context of 39 developing nations from this region and uses it as a proxy for the carbon emission-related environmental problems they have faced during the 2000–2020 period. This index is estimated by utilizing data regarding annual carbon dioxide discharges, output-based carbon productivity rates, and energy consumption-based carbon intensity levels in the concerned countries. Hence, policy takeaways from this study have critical relevance for the selected sub-Saharan African nations to help them achieve the objectives related to the Sustainable Development Goals agenda and the Paris Accord. Overall, the findings from the econometric analyses verify that more receipt of foreign direct investment initially raises but later on reduces environmental problems. Thus, the nexus concerning these variables depicts an inverse U-shape. Besides, the results endorse that greening the energy consumption structures of the sampled sub-Saharan African countries helps to abate their environmental problems in the long run while financial development aggravates the extent of environmental adversities that take place. Lastly, improving the quality of regulatory agencies enables the Sub-Saharan African nations to further mitigate their environmental problems. Moreover, these aforementioned findings are observed to be heterogeneous across low- and middle-income categories of the selected Sub-Saharan African countries. Furthermore, the heterogeneity of the findings is also confirmed by the outcomes derived from the country-specific analyses. Nevertheless, these nations should attract clean energy-embodying foreign direct investment, make their energy consumption structures greener by amplifying renewable energy adoption rates, introduce green funds to develop their financial sectors, and make their environmental regulatory agencies more transparent with their activities.

Keywords: Sub-Saharan Africa Carbon emissions Composite carbon index Foreign direct investment (FDI) Green energy transition Financial development

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