

ABSTRACT

This study investigates the relationship between economic growth, renewable energy consumption, fossil fuel consumption, foreign direct investment (FDI), and carbon dioxide (CO₂) emissions in Botswana within the Environmental Kuznets Curve (EKC) framework. Botswana has experienced sustained economic growth over the past decades, driven primarily by mining activities and foreign investment. However, this growth has also increased energy demand and environmental degradation due to the country's continued reliance on fossil-fuel-based electricity generation. Using annual time-series data from 1994 to 2024, the study applies the Autoregressive Distributed Lag (ARDL) model to estimate both short-run and long-run relationships among the variables. The findings reveal that GDP per capita and fossil fuel consumption significantly increase carbon emissions, while renewable energy consumption reduces environmental degradation in both the short run and the long run. The coefficient of GDP squared is negative and statistically significant, confirming the existence of the Environmental Kuznets Curve hypothesis in Botswana.

Keywords: Environmental Kuznets Curve, Renewable Energy, Fossil Fuel Consumption, Foreign Direct Investment, Carbon Emissions, Botswana, ARDL

