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REVIEWER'S REPORT

Manuscript No.: IJAR-54458 Date: 24-10-2025

Title: THE IMPACT OF ECONOMIC GROWTH, FOREIGN DIRECT INVESTMENT, AND ENERGY ON CLIMATE CHANGE IN WEST AFRICA.

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	✓			
Techn. Quality		✓		
Clarity	✓			
Significance	✓			

Reviewer Name: Tahir Ahmed

Reviewer's Comment for Publication.

1. General Overview

This manuscript applies a **panel ARDL–PMG framework** to examine the **Environmental Kuznets Curve (EKC)** hypothesis and the dynamic linkages among economic growth, energy consumption, foreign direct investment (FDI), and carbon emissions in West Africa. The study's econometric design and analytical rigor are commendable. The inclusion of both **long-run and short-run coefficients**, coupled with a clearly interpreted **Error Correction Term (ECT)**, lends robustness and policy relevance to the findings.

The paper's results — particularly the confirmation of an **inverted-U EKC** and the identification of **energy use as the dominant emission driver** — contribute meaningfully to the regional empirical literature. However, the paper would benefit from a few clarifications on model selection criteria, diagnostic robustness, and variable interpretation.

2. Structure and Organization

The structure of the results and discussion sections is sound and logically presented. The ARDL results are summarized effectively, followed by a contextualized interpretation. The

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transition from numerical results to narrative analysis (lines 254–295) is smooth and demonstrates a mature academic writing style.

Minor improvement suggestions:

- Include a **brief restatement of model specification** before presenting results, for standalone clarity (e.g., variable definitions and lag orders).
- Present the **Akaike Information Criterion (AIC) model selection table** in a more concise format or as an appendix to improve readability.
- Label subsections (e.g., "4.3.1 ARDL–PMG Results," "4.3.2 Discussion," "4.3.3 EKC Visualization") consistently in journal style.

3. Methodological Evaluation

The use of the **Pooled Mean Group (PMG) estimator** under the ARDL framework is methodologically appropriate for regional panel data with heterogeneous short-run dynamics. The justification through the **Akaike Information Criterion (AIC)** strengthens the empirical strategy.
Key strengths include:

- Clear reporting of **short-run and long-run coefficients with p-values**.
- Inclusion of a statistically significant **ECT (–0.126, p = 0.000)** confirming convergence toward equilibrium.
- Alignment of results with foundational EKC literature (Grossman & Krueger, 1994; Dinda, 2004; Panayotou, 1993).

Areas for improvement:

- Briefly discuss **diagnostic tests** (serial correlation, heteroskedasticity, normality, and stability of parameters).
- Mention whether **cross-sectional dependence** and **unit root pre-testing** (e.g., IPS, LLC) were addressed.
- Provide a concise rationale for excluding other potential explanatory variables such as industrialization or trade openness, which could mediate emissions.

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4. Results Interpretation

The interpretation of coefficients is well articulated:

- The **negative long-run coefficients** of GDP (–0.606, p=0.000) and GDP² (–2.571, p=0.000) strongly support an inverted-U EKC pattern.
- The **positive and significant energy consumption elasticity (1.041)** indicates that energy use remains the main long-run determinant of emissions, consistent with literature on developing economies.
- The **neutral FDI effect (0.0097, p=0.151)** is accurately linked to institutional and sectoral factors in West Africa.
- The **ECT coefficient (–0.126)** implies stable adjustment, validating the long-run relationship.

Suggestions:

- Include **magnitude interpretation** (elasticity implications) — e.g., "A 1% increase in energy consumption increases emissions by approximately 1.04%."
- Discuss the **economic threshold level** implied by the EKC turning point, even approximately, to enrich policy interpretation.
- Clarify whether the **short-run GDP coefficient (0.367, p=0.036)** suggests a transitional phase before decoupling occurs.

5. EKC Visualization and Presentation

The EKC simulation is effectively executed, and the **inverted-U pattern** is clearly described. The explanation of the anti-log transformation and its interpretive value demonstrates strong technical understanding.
Minor improvements:

- Include **axis labels and units** in Figure 4.1 to enhance interpretability.
- Mention the **turning point income level** derived from the model parameters.

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- Provide a concise note on **policy relevance** of the EKC pattern (e.g., investment in clean energy post-threshold).

6. Clarity and Style

The writing is **clear, precise, and scholarly**, with appropriate referencing and consistent use of technical terminology. The discussion section successfully integrates statistical findings with theoretical insights and past empirical results.
Minor edits needed:

- Ensure all **table headings** include variable definitions (LCO_2, LGDP, LEC, etc.).
- Format the **table of ARDL models (AIC rankings)** uniformly (same decimal places and alignment).
- Replace "shortrun" and "longrun" with "short-run" and "long-run" consistently.

7. Significance and Contribution

The paper provides **strong empirical evidence** of the EKC hypothesis in West Africa, where earlier studies yielded mixed results. The study's originality lies in combining:

- The **ARDL–PMG methodology**,
- A **focus on regional heterogeneity**, and
- The **integration of energy consumption and FDI** into the EKC framework.

Its results have **direct policy implications** for environmental management, energy diversification, and sustainable investment. The findings are valuable to policymakers, environmental economists, and regional development agencies.

8. Recommendations for Improvement

1. Add a short **subsection on econometric diagnostics** (stability, residual checks).
2. Indicate **data range and sources** (years and countries) near the results table for transparency.

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3. Derive and report the **EKC turning point** for policy insight.
4. Improve **figure labeling** and table formatting.
5. Briefly summarize **policy implications** at the end of the discussion.
6. Proofread for minor stylistic corrections (spacing and hyphenation).

9. Final Evaluation

This manuscript is **methodologically robust, theoretically grounded, and empirically convincing**. It provides important regional evidence supporting the Environmental Kuznets Curve hypothesis and highlights the critical role of energy use in shaping emissions trajectories in West Africa. With **minor revisions** to clarity, diagnostics, and presentation, it is well suited for publication in an environmental economics or sustainable development journal.