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REVIEWER'S REPORT

Manuscript No.: IJAR-54461 Date: 24-10-2025

Title: COMPATIBILITY TEST OF Trichoderma virens AND Metarhizium anisopliae AND THEIR ABILITY TO CONTROL Oryctes rhinoceros LARVAE IN COMPOST.

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

The manuscript presents a robust empirical investigation into the **Environmental Kuznets Curve (EKC) hypothesis** using **panel ARDL-PMG estimation** for West African countries. The study contributes meaningfully to the ongoing discourse on the **relationship between economic growth, energy consumption, and environmental degradation** in developing economies.
The paper demonstrates strong theoretical grounding, meticulous econometric analysis, and a clear presentation of long-run and short-run dynamics. However, a few technical clarifications and stylistic adjustments would further enhance its academic rigor and readability.

2. Structure and Organization

The overall structure follows a coherent scientific layout — **introduction, literature review, methodology, results, discussion, and conclusion**.

- The **introduction** effectively contextualizes the research question, linking economic development with environmental policy concerns in West Africa.

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- The **results section** is particularly well-organized, combining statistical tables with interpretive analysis.
  However:
- The **literature review** could be streamlined to focus more tightly on empirical EKC studies within Africa or similar developing regions.
- Section numbering and figure references (e.g., Table 4.3.1, Figure 4.1) should be standardized throughout.
- The text between lines 252–295 (discussion and visualization) could be condensed to improve flow and readability.

Overall, the structure is sound and journal-appropriate, requiring only minor editorial refinement.

3. Methodology

The methodological design is a major strength of the paper. The authors appropriately use the **Pooled Mean Group (PMG) estimator within the ARDL framework**, allowing for heterogeneous short-run dynamics and homogeneous long-run relationships across countries.
Commendable aspects include:

- Model selection via **Akaike Information Criterion (AIC)** for robustness.
- Incorporation of key variables (GDP, GDP^2, energy consumption, FDI, and CO_2 emissions).
- Explicit reporting of both long-run and short-run coefficients with significance levels.

Suggestions:

- Add more detail on **data sources** (e.g., World Development Indicators, years covered, and country sample).
- Clarify the **stationarity tests** used (ADF, PP, or IPS) to justify ARDL applicability.
- Briefly discuss **diagnostic checks** (autocorrelation, heteroscedasticity, and stability tests).
  These minor additions would enhance methodological transparency and replicability.

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4. Results and Interpretation

The **empirical results** are clearly articulated and statistically robust. The study provides strong evidence supporting the **EKC hypothesis**, indicating an **inverted-U relationship** between GDP and CO_2 emissions.

Key insights include:

- The **negative long-run coefficients** for GDP and GDP² confirm the turning point dynamics of the EKC.
- **Energy consumption (LEC)** emerges as the dominant driver of emissions, both in the short and long run, consistent with previous empirical findings (Shahbaz et al., 2013).
- **FDI** shows no significant environmental effect, suggesting a neutral or context-dependent impact in West Africa.
- The **error correction term (ECT)** is negative and significant (−0.126, p=0.0000), confirming long-run equilibrium adjustment.

Commendably, the authors compare their findings to seminal studies (Grossman & Krueger, Panayotou, Dinda) and provide a policy-oriented discussion.

Recommendations:

- Highlight the **economic interpretation of the turning point** (e.g., income per capita level at which emissions begin to decline).
- Include a **robustness check** (e.g., DOLS or FMOLS) to validate PMG results.
- Integrate a short paragraph discussing **policy implications** for renewable energy investment and sustainable growth strategies.

5. Clarity and Presentation

The paper is **well-written, technically precise, and clear** in its argumentation. The tables are informative and neatly formatted, though some spacing and alignment adjustments would improve legibility.

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The EKC visualization (Figure 4.1) effectively reinforces the statistical evidence, though axis labels and units should be explicitly defined.

Minor stylistic notes:

- Ensure uniform citation formatting (e.g., *Shahbaz et al., 2013* vs. *Shahbaz, 2013*).
- Use consistent decimal notation (e.g., 0.0001 not .0001).
- Simplify long sentences in the discussion for smoother flow.

Overall, presentation quality is high, reflecting careful attention to both form and substance.

6. Significance and Contribution

This research contributes substantially to understanding growth–environment dynamics in developing economies, specifically in the West African context.
Key contributions:

- Empirical validation of the EKC hypothesis using a region-specific dataset.
- Integration of energy consumption and FDI variables for a more holistic analysis.
- Clear policy relevance — findings provide actionable insights for green growth policies, energy efficiency, and sustainable development planning.

Given the scarcity of cross-country econometric EKC studies focused on West Africa, this work holds significant academic and policy value.

7. Recommendations for Improvement

1. Specify data sources, timeframe, and sample composition in the methodology section.
2. Briefly describe pre-estimation tests (unit root, cointegration diagnostics).
3. Add policy-oriented discussion emphasizing renewable energy transitions and environmental governance.
4. Ensure uniform citation and reference formatting.
5. Refine figure and table captions for consistency.
6. Condense repetitive statements in the discussion for conciseness.

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8. Final Evaluation

The paper demonstrates **strong technical execution**, **relevant policy implications**, and **clear alignment with existing EKC literature**. Minor methodological clarifications and stylistic refinements will elevate it to publishable quality in an international journal.