CLIMATE CHANGE AND INCOME INEQUALITY: THE ROLE OF SECTOR AND EMPLOYMENT DIVERSIFICATION

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Overview

Climate change is one of the most critical challenges facing humanity, with significant economic, social, and environmental consequences. Its disproportionate impact on low-income populations exacerbates existing income inequality. Developing nations, reliant on climate-sensitive sectors such as agriculture and tourism, are particularly vulnerable. While the link between climate change and inequality is established, limited research exists on the mitigating roles of sector and employment diversification. This study investigates these relationships, emphasizing the interplay between diversification strategies, governance, and social readiness. The main objectives of this study are following:

1. Assess the impact of climate change on income inequality.
2. Explore the moderating effects of sector diversification on this relationship.
3. Analyze how employment diversification and social readiness mitigate socio-economic vulnerabilities.

Methods

The study employs panel data from 132 countries (1995–2020). Income inequality is measured using the GINI index, while climate change is represented by the Climate Vulnerability Index (CVI). Sector and Employment Diversification Indexes (SDI and EDI) are derived using the Herfindahl-Hirschman Index. Control variables include GDP per capita, urbanization rate, unemployment, governance readiness, and social readiness.

A robust econometric framework is applied:

- Fixed Effects (FE) models with Driscoll-Kraay standard errors address heteroskedasticity and autocorrelation.
- Instrumental Variable Generalized Method of Moments (IV-GMM) corrects endogeneity issues.
- Error Correction Models (ECM) capture short- and long-term dynamics.
  Interaction terms (e.g., CVI × SDI × Governance) assess the moderating effects of diversification and institutional factors.

Results

1. **Baseline Results:** Climate vulnerability significantly exacerbates income inequality, with stronger effects in developing countries due to weaker governance and higher dependency on climate-sensitive sectors. Sector diversification reduces inequality, particularly in economies reliant on a single sector. Employment diversification has mixed effects: beneficial in developed nations but exacerbating inequality in labor-segmented developing economies.

2. **Moderating Effects:**

    - Sector diversification, when combined with strong governance, offsets the adverse effects of climate vulnerability. Interaction terms (CVI × SDI × Governance) reveal that diversified economies with robust institutions are more resilient to climate-induced inequality.

    - Employment diversification, supported by social readiness (CVI × EDI × Social), reduces inequality by expanding job opportunities and enhancing labor market mobility, especially in developing countries.

3. **Sectoral Impacts:** Climate vulnerabilities in food, water, health, ecosystems, habitat, and infrastructure disproportionately drive inequality. Diversification and governance are most effective in addressing vulnerabilities in ecosystems, habitat, and infrastructure, highlighting the need for targeted interventions.

Conclusions

The study demonstrates that climate change exacerbates income inequality, but sector and employment diversification, underpinned by governance and social readiness, can mitigate its effects. These findings emphasize the importance of inclusive climate policies that reduce disparities and enhance economic resilience. Policymakers should prioritize diversification strategies and strengthen institutional and social frameworks to ensure equitable adaptation to climate change. The study aligns with Sustainable Development Goals (SDGs), particularly SDG 10 (Reduced Inequalities) and SDG 13 (Climate Action).

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