


Chapter 3


Economic Growth, Human Resource Development, and Climate Resilience in BRICS: A Panel Data Analysis

Varsha Sharma

 <https://orcid.org/0000-0001-5462-4693>


Chandigarh University, Mohali, India

Pragti Dixit

 <https://orcid.org/0009-0002-4034-4572>

Chandigarh University, Mohali, India

Mukul Bhatnagar

 <https://orcid.org/0000-0002-7773-5641>

Graphic Era University, Uttarakhand, India

Nikhil Varghese

Christ University, Bengaluru, India

Anshuman Singh

Graphic Era University, India

ABSTRACT

Present study employs panel data analysis on BRICS economies data spanning from 2000 to 2023, to examine the impact of human resource development, renewable energy consumption, and carbon emissions on GDP per capita of BRICS economies,

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finding that while human capital strongly drives growth, renewable energy has a positive but weaker effect, and carbon emissions remain tightly linked to GDP, underscoring the persistent reliance on carbon-intensive industries, ultimately highlighting the need for policy shifts toward sustainable growth through education, clean energy transitions, and regulatory frameworks that balance industrialization with climate resilience.

INTRODUCTION

The BRICS economies—comprising Brazil, Russia, India, China, and South Africa—serve as a formidable engine of global economic dynamism, collectively accounting for a substantial share of worldwide GDP, trade, and investment flows, while exhibiting diverse yet complementary developmental trajectories that underscore their strategic significance in reshaping the geopolitical and economic landscape, driving industrialization (Lavrik & Saurombe, 2025), technological innovation, and infrastructural expansion, all while grappling with the intricate challenges of socio-economic disparities, climate vulnerabilities, and sustainable development imperatives, thereby positioning them as pivotal actors in fostering a multipolar world order, advancing South-South cooperation, and spearheading policy frameworks that balance rapid economic growth with long-term environmental resilience and human capital enhancement (Leal-Arcas et al., 2022).

The interplay between economic growth, human capital, and climate resilience in BRICS economies manifests as a multidimensional nexus wherein sustained economic expansion is inherently dependent on strategic investments in human resource development—encompassing education, workforce upskilling, technological innovation, and institutional capacity-building—while simultaneously necessitating robust climate resilience frameworks that mitigate environmental vulnerabilities through adaptive policies, green energy transitions, and sustainable resource management, thereby ensuring that economic progress does not come at the expense of ecological degradation but rather fosters a synergistic equilibrium where human capital serves as a catalyst for both productivity-driven growth and climate adaptation, ultimately enabling BRICS nations to navigate the complexities of industrialization, environmental sustainability, and socio-economic inclusivity in an era of global uncertainty and climate-induced disruptions (Martins, 2019).

Human capital serves as a pivotal catalyst for economic growth in BRICS economies by fostering a highly skilled, innovative, and adaptive workforce that enhances labor productivity, accelerates technological advancements, and drives industrial diversification, wherein strategic investments in education (Kukreti et al., 2024b, 2024c), vocational training, digital literacy, and research and development (R&D)

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