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Does human capital complement sustainable development goals? Evidence from leading carbon emitter countries

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ABSTRACT

In the quest to address economic and environmental issues, the UNDP emphasized generating synergy among various sustainable development goals (SDGs). In this regard, SDG4 (Quality of education) is the most crucial SDG, as human capital may help improve the quality of life and environment in the long run. Against this backdrop, this study explores human capital's direct and moderating effect on carbon emissions in nine leading carbon emitter nations from 1990 to 2018. We rely on a quantile approach to calculate elasticity coefficients and verify results using the cross-sectional-autoregressive-distributed lag (CS-ARDL) procedure. The results suggest that human capital leads to carbon emissions across quantiles when the direct impact of human capital on carbon emissions is assessed. Similarly, human capital helps navigate carbon emissions when interacting with industrial value-added and per-capita income. The association between the squared term of human capital and carbon emissions is negative across quantiles in leading carbon emitter nations. Besides investing in human capital, these nations need to intensify the usage of cleaner energy and advanced technologies because the elasticity coefficients of these variables are found to be negative across quantiles. We propose a sustainable growth roadmap in which interconnectedness among certain SDGs is considered.

1. Introduction

As per Solow's (1956) growth model, technological advancement helps countries achieve economic growth targets in the long run. However, in recent years, human capital development or investment in human resources has also been considered necessary for higher economic growth as a skilled labor force enables industrial units to utilize modern production processes, develop new ways of production, and minimize industrial wastes (Sharma et al., 2022; Yao et al., 2020). In contrast, an unskilled labor force in a dynamic economic environment elevates negative externalities such as reduced labor productivity, increased industrial waste, and an unhygienic work environment (Khan, 2020). Therefore, it may not be wrong to affirm that industrial units operating with advanced production processes and skilled labor force

may strengthen the region's economic growth and established ecosystem (Siddiqui et al., 2022; Sinha et al., 2020). Moreover, without improvement in the technical and vocational education levels, the widespread usage of modern technology may not be possible (Chen et al., 2021). Therefore, complementarity between physical and human capital may help industries to maximize production with minimum effort. Subsequently, a skilled labor force may elevate per capita income, improving their quality of life. In other words, actions towards the achievement of sustainable development goals (SDG) 4 (quality education) and SDG9 (innovation and industrial infrastructure) may help countries achieve economic and sustainability goals in the long run.

However, most countries, especially the industrialized nations, have adopted a pro-growth strategy that has proven harmful to environment (Sharma et al., 2021a). This has led academicians and policymakers to

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