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Achieving 13th Sustainable Development Goal: Urbanization and ICT Empowerment in Pursuit of Carbon Neutrality - Beyond Linear Thinking

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Abstract : The attainment of the carbon neutrality objective and Sustainable Development Goal 13 (SDG-13) target, which pertains to climate actions, received widespread attention in developing and emerging nations. Given the increasing pace of urbanization, technological advancements, and rapid growth, it is imperative to examine the linear and nonlinear effects of urbanization and economic growth and the linear impact of information and communication technology (ICT) on carbon emissions (CO2e). This study employs the Dynamic System GMM (DSGMM) and Panel Quantile Regression (PQR) methodologies to investigate the causal relationship between urbanization, ICT, economic growth, and their interplay on CO2e in 39 BRI countries from 2001 to 2020. The study's findings indicate that the impact of urbanization on CO2e exhibits linear and nonlinear patterns. The specific nonlinear impact of urbanization leads to a decrease in CO2e, hence facilitating the achievement of carbon neutrality and contributing to SDG-13. The study highlights the importance of ICT in achieving SDG-13 by reducing CO2e, emphasizing the need for informatization. Simultaneously, the findings support the Environmental Kuznets Curve (EKC) hypothesis and support the pollution haven theory. Finally, based on empirical findings, significant policy implications are suggested for achieving SGD 13 and carbon neutrality.

Keywords : urbanization, ICT, CO2 emission, EKC, pollution haven, BRI
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