

Relationship between carbon emissions and economic growth in South Asian countries (1990-2023)

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Carbon emissions, especially from diverse industrial activities and energy consumption, are the main causative factors of climate change and the disruption of environmental balance. The South Asian region is at the forefront of carbon emissions, as it includes developing nations. They are experiencing rapid population growth along with economic development contexts, which further intensify their carbon emissions footprint. Accordingly, this study aims to analyze the relationship between carbon emissions and economic growth in south Asian countries (1990-2023). To achieve the objective, data on annual CO₂ emissions and CO₂ emissions per capita have been collected from the “Our World in Data” source. Gross Domestic Product (GDP) and GDP per capita data were gathered from the “Macrotrends” data source. After the standardisation of those indicators, Pearson's linear correlation was utilised to analyze the relationship between carbon emissions and economic growth. According to the results, the relationship between annual carbon emissions and GDP has ranged between 0.92 and 0.99, which reveals a strong positive correlation since rapid industrialisation, high energy consumption, and tourism-based economic activities. Furthermore, the relationship between carbon emissions per capita and GDP per capita is illustrated as a positive correlation, with a range from 0.77 to 0.98. From this perspective, high automobile dependency, rapid urban sprawl, extensive fossil fuel consumption, and heavy tourism-related industrial activities are the main factors explaining this strong positive relationship. Thus, the carbon footprint in those countries is gradually increasing, and also the emerging future environmental challenges of economic activities. Hence, strategies such as using renewable energy sources, structured urban planning, introducing a sustainable tourism industry, and improving energy efficiency for low carbon emissions must be proposed to maintain environmental balance and ensure economic and environmental sustainability.

Keywords: *Carbon emissions, Economic growth, Relationship, South Asian countries*