THE IMPACT OF POPULATION-RELATED FACTORS ON CARBON EMISSION IN SRI LANKA

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The global increase in carbon emissions is a pressing environmental concern, as it plays a significant role in climate change and affects ecosystems and human health. Population-related variables are significant drivers that have a crucial influence on carbon emissions. As a developing country, Sri Lanka's CO_2 emission increases annually. According to the World Bank data, Per-capita CO_2 emission in 1990 was 0.22 (metric tons), and in 2021, it became 1.13 (metric tons). This increase was recorded within 21 years. Therefore, this study aims to investigate the causal relationship via which population-related factors influence carbon emissions in Sri Lanka (1990-2021). The ADF unit root test confirmed that mixed-order integration of variables and hence the Auto Regressive Distributed Lag (ARDL) model combined with the STIRPAT model determined the relationship among variables in the model. The ARDL (1, 2, 0, 2, 0, 0) model is selected based on AIC, and the results confirmed the long-run and short-run relationships among variables. The population size (midyear population) did not significantly impact CO_2 emissions in the study period in Sri Lanka. The insignificant midyear population in the model implies that the country's total midyear population is not the prominent demographic factor for CO_2 emission in Sri Lanka. According to the study findings, the working-age population and per capita energy consumption positively and significantly impacted CO_2 emissions in the short and long run. These positive impacts confirmed that the working-age population is one of the prominent variables for CO_2 emission. In contrast, per capita GDP and energy intensity had a negative effect. Therefore, according to these findings, Sri Lankan economic structural changes, such as the service sector becoming a prominent sector and the industrial and agricultural sectors becoming 2nd and 3rd, have significantly influenced the CO_2 emissions in the country. Thus, this study's findings suggest that the Sri Lankan government should focus more on renewable energy sources while promoting and continuing the industrial sector's growth by adopting sustainable and eco-friendly policies. Furthermore, the working-age population should be responsible for minimising and reducing energy consumption while working to help achieve sustainable development and reduce the CO_2 emission that impacts world climate change.

Keywords*:* CO_2 emissions, STRIPAT model, Population-related factors, Sri Lanka