



Does environmental degradation shackle economic growth? A panel data investigation on 11 Asian countries



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ABSTRACT

Sustainable economic growth needs to be the primary objective of every government, including developing Asian countries, to improve the social welfare of the people. Therefore, to achieve the desirable level of sustainable economic growth, environmental degradation must be controlled without lowering real growth and the well-being of the society. This study empirically investigates the impact of environmental degradation by CO₂ emissions on the economic growth of 11 Asian countries between 1990 and 2011. Based on the nature of the data, traditional panel estimation techniques encompassing fixed effects and random effects are employed, in which the results of Hausman's test and other tests show that the use of fixed effects is preferable over the random-effect estimator. Empirical results exhibit that environmental degradation has a significantly negative impact on economic growth. Empirical findings also suggest that environmental degradation should be regulated. Therefore, environmentally enlightened management policies for the decrease of CO₂ emissions and fuel consumption by transportation and industries need to be pursued by Asian countries. The adoption of safe carbon emission cut-back policies is a promising path to sustainable economic growth.

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1. Introduction

Environmental pollution is a vital issue in the process of sustainable economic development because it has threatening consequences for economic growth and human well-being. Pollution is the cause of various negative effects on health, resource exhaustion, and natural calamities associated with climate change. Environmental pollution occurs when the natural environment is

vulnerable to the decomposition of unnaturally produced elements, which humans are not knowledgeable of handling. Focal forms of pollution include atmospheric, water, noise, land dilapidation, and soil. The sources of atmospheric pollution include the burning of fuels to create energy for heating and power production in the domestic and industrial sectors; exhaustion of emissions due to transport automobiles that consume diesel, petrol, and oil, among others; and production of waste gases, dust, and heat from

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industrial sites comprising chemical manufacturers and electrical power-generating stations. The three key contaminants of ambient air quality are nitrogen dioxide, particulate matter, and sulfur dioxide [11,18,51].

Cutting of trees, soil dilapidation, and loss of biological diversity are important issues for academicians, economists, and policy makers. The predominant causes of air and water pollution and global warming are objectively understood as the consequence of enhanced and unrestrained human activities at distinctive stages of economic growth and development, such as agriculture, industries, transportation, and energy production. Environmental, economic, and social issues are interconnected and must be resolved not only for the development of today's human welfare, but also for that of future generations. Environmental degradation hampers growth and threatens future development in all aspects of human welfare.¹ Pollution has increased considerably because of human activities, mostly through the usage of fossil fuels and the changes in land use directly connected with economic development. The impacts of CO₂ emissions have been shocking, especially global warming, which affects the environment and human well-being. Numerous experts have explicated the need to reduce individual carbon footprints and invest billions to mitigate the risks of change in the earth's environment [30,54].

Auci and Trovato [10] expound that the environment will probably be affected as the economy develops, which will have an unfavorable impact on natural order, society, economy, and infrastructure. The adverse relation between economic growth and environmental degradation requires appropriate environmental policy reactions and strategies locally, regionally, nationally, and internationally. Sebri and Salha [49] state that the main cause of global warming is the increase of CO₂ emissions in Brazil, Russia, India, China, and South Africa (BRICS). Kasman and Duman [40] also mention that industrial revolution not only began a new period of fast economic growth among countries, but simultaneously produced global warming and climate change. The main aspect of industrial development is the conversion of global organic economies based on animal and human power to inorganic economies based on fossil fuel sources. The usage of fossil fuels unambiguously and constantly disorders the carbon levels in the atmosphere and causes the heat to be conserved in the atmosphere. Alexander-Kearns and Cassady [6] suggest that smart policies for controlling CO₂ emissions can provide an impetus to economic growth. Therefore, the correlation between environmental humiliation by CO₂ emissions and economic growth has been a central topic triggered by concerns for the environment and sustainable growth and development.

CO₂ emissions truly play a significant role in present-day debates owing to their detrimental effects on the process of sustainable growth and development. Pollution occurs because CO₂ emissions reduce output by decreasing the productivity of human-made capital, as well as the workforce by affecting human health due to polluted air, water, and so forth. Available literature reveals that prior studies empirically explore the causal linkage between CO₂ emissions, economic growth, and energy use along with some other variables,² and some studies are only confined to test the validity of the Environmental Kuznets Curve. Quantitative studies on the effect of CO₂ emissions on growth in the context of developing Asian countries are uncommon. Thus, the current study aims to quantitatively investigate whether there is any adverse effect of environmental degradation by CO₂ emissions³ on

economic growth measured by real GDP per capita in 11 Asian countries between 1990 and 2011. This study also considers other explanatory variables, such as energy consumption, inward foreign direct investment, and human capital. Countries used in this study are low, lower, and middle countries based on income level according to the World Bank classification [Bangladesh (low income); India, Indonesia, Mongolia, Pakistan, Sri Lanka, Vietnam, and the Philippines (lower middle income); and China, Malaysia, and Thailand (upper middle income)].⁴ In addition, this study assumes that the sample countries have similar characteristics. The empirical findings are expected to guide policy makers on CO₂ emissions and economic development in order to formulate appropriate sustainable development-oriented policies that are largely environmentally conducive. This study contributes to the literature on the impact of environmental degradation by CO₂ emissions on the economic growth for Asian countries and can be extended to other countries to boost sustainable economic development.

1.1. CO₂ emissions and economic growth in Asia: an overview

Rapid economic and population growth create crucial social results from the environmental problems of air pollution, deforestation, global warming, overfishing, urban overflow, and restricted safe water supplies all over the Asia-Pacific region.⁵ According to the United Nations Environment Program (2012), the Asia-Pacific is the fastest flourishing economic region in the world, yet unsustainable economic development, population growth, and enlarged consumption and urbanization threaten its sustainable economic growth and development. The Asian Development Bank [1] noted that the entire Asia-Pacific region has achieved substantial success with the millennium development goals, especially in diminishing income poverty. However, the region still faces numerous constant and evolving threats in rising inequality, demographic shifts, and unplanned urban population growth, along with climate change and environmental burdens. Economic growth, which is motivated by industrialization, has essentially relied on the improper utilization of natural resources, and thereby contributed to environmental problems.

The existing scarce natural resources are under excessive pressure because of the expanding population growth and urbanization. The deleterious impacts of urbanization and industrialization have destroyed ambient air quality, adversely affected proper solid waste disposal, and created unjustifiable consumption pattern and resource inadequacy. The air quality in South Asian countries is affected by the emission of pollutants, such as particulate matters and gaseous emissions, including sulfur oxides and nitrogen oxides. This pollution is apparent in the destruction of ambient air quality in main cities where, in 2010, CO₂ emissions per capita reached 1.4 metric tons. Urban areas are facing the most significant environmental problems because of the nonexistence of proper solid waste disposal and the absence of improved sanitation technology. Poverty elimination and environmental sustainability have been evidently observed as key challenges in attaining sustainable development in the South Asian sub-region [48]. Wang et al. [57] reveal that the fast growth of energy use in China has led to enlarged emissions of air pollutants.

According to the BP Energy Outlook [20], the worldwide

¹ [26].

² [24,27].

³ Due to the non-availability of data on variables include nitrogen dioxide, particulate matter, and sulfur dioxide emissions pollutants, this study uses CO₂ emissions as a proxy variable for environmental degradation.

⁴ Countries by Income Group: Classification of Countries is from the World Bank, July 2012, on the basis of 2011 GNI per capita. Retrieved <http://www.gfmag.com/global-data/economic-data/pagfgt-countries-by-income-group>. Moreover, this study intends to use many developing countries from Asia, but the data (balanced) on the set of incorporated variables are available only on these 11 Asian's countries.

⁵ [59].

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