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ENERGY CONSUMPTION, ECONOMIC GROWTH AND THE ENVIRONMENTAL DEGRADATION IN ASIAN COUNTRIES

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ABSTRACT

Environmental pollution is an emerging issue in Asian countries. It affects quality of life and is dangerous for human life. It has been observed that carbon emissions from Asian countries are speedily increasing. The major factors causing environmental degradation are GDP per capita, industrialization, urbanization, and energy use. This study is an effort to highlight the causes of environmental degradation in eight Asian countries by using 10 years of data. Moreover, the study has used the fixed effect method to highlight the significance of major causes of environmental degradation in the concerned economies. Results show that urban population, energy consumption, economic growth, and financial development increase carbon emission CO₂ (i.e., environmental degradation) in Asian countries. The result suggested that the Government must reduce the carbon emission level in these countries and must provide a better environment to the population.

Keywords: *Economic growth; Financial development; Environmental degradation; Asian countries.*

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INTRODUCTION

Population plays an important role in economic development; however, this is a major reason for ecological degradation when it enhances the threshold limits of the support structures. If the relationship between the multiplying population and the life-supporting arrangement can become stable, developmental plans, although, inventive are not almost certainly to offer predictable results. Population affects the atmosphere basically by using physical resources and making waste and is linked with ecological pressures such as loss of biodiversity, air and water contamination, and enhanced pressure on arable land. Human population problems are much vital when comes to life and our future on this planet. Poverty also deteriorates the environmental degradation. The global relationship between poverty and the environment is a much more difficult issue. Inequality leads to an increase the unsustainability because the poor, depend on natural resources much as compared to financially healthy people, who reduce natural resources as they have no accurate way of approaching other kinds of resources. Furthermore, despoiled surroundings can enhance the impoverishment process, again because the deprived are dependent on natural assets in a direct way.

Very low job chances in rural areas and the environmental pressures are increasing to an emerging mobility of deprived people to cities. Megacities seem increasing and the city's poor conditions are increasing day by day. Such rapid and unintended increase in cities has resulted in urban environment deterioration. It has increased the gap between demand and supply of infrastructural amenities like energy, housing facilities, transportation, communication, education, water supply, and sewerage, hence reducing the valuable ecological resource base of urban areas. All this caused for increased tendency to worsen air and

water quality, increasing waste, the explosion of shantytowns, and unwanted land usage changes, all of which have a great share in poverty increase. A lot of research has been done on the linkage between economic growth and environmental degradation, but much focus has been on the association between economic growth and energy usage. According to Yang et al. (2015) economies' increasing development levels, have increased the requirement for fossil fuels to exceeding levels. Ang (2007) has shown a link between energy consumption and economic development, focusing on issues of making initially any possible fundamental directions.

Carbon emanation is a global issue. However, much of the discussions are required on how such structures as population and economic growth come into action on the release of CO₂ in any economy. The noteworthy source of CO₂ is mostly discharged from the burning of fossil fuels (Yeh & Liao, 2017). CO₂ emission and energy consumption are linked at the household level among urban and rural populations. In recent times, as household energy consumption and CO₂ release have increased, more and more scholars have highlighted this problem. In this way, strategies for energy disasters and CO₂ release regulators are habitually intent on the manufacturing segment, without considering household subdivision, which is cheap energy consumption (Ma et al., 2016).

Economic growth can be indomitable by international trade. However, its influence on the environment cannot be observed. Trade permits an economy possessing more labor to produce environmentally friendly goods and vice-versa, therefore subsequent to a positive or negative composition influence. Trade has a great influence on the quality of the environment in a positive and negative way. In this research, we have to check the influence of economic growth, energy usage, urban population, and financial development on environmental degradation by using a fixed-effect technique in Asian countries.

Statement of the problem

Environmental degradation has been increasing very rapidly in developing and developed countries due to much production of goods and services and the utilization of resources in these economies. It has created the threat of a polluted environment, environmental diseases, and depletion of resources. Considering the importance of this emerging issue we have analyzed the major causes of Co₂ emissions and environmental degradation in Asian economies to give policy suggestions to resolve this issue to make better the environment.

Research objectives

The research makes an effort to investigate the impact of factors on environmental degradation in Asian economies.

The major points are given as:

1. It analyses the impact of economic growth on environmental degradation
2. It estimates the influence of urban population on environmental degradation.
3. It estimates the influence of energy consumption on ecological degradation.
4. It has analyzed how financial development impacts ecological degradation.

Research Questions

1. What's the impact of economic growth on CO₂ emission (proxy of environmental degradation)?
2. How does increasing urban population affect environmental degradation?
3. Impact of high energy usage on environmental degradation.
4. How financial development does have effects on environmental degradation?

Hypothesis of the Study

The following are the hypotheses of this study.

1. Economic growth and environmental degradation are positively associated in Asian economies.
2. The higher the energy consumption, the higher the environmental degradation
3. Urban population and environmental degradation are linked positively.
4. The higher the financial development, the higher the environmental degradation.

Significance of the Study

Increasing Co2 emissions and deteriorated or polluted environment have been a debatable issue. A lot of economies are facing this problem. This study makes an effort to highlight the basic causes of increasing this issue. So that this problem of polluted environment can be reduced and controlled.

Research Gap

Much research has been done to find out the effect of trade openness, labor force participation rate, exports, total population, and energy usage on environmental degradation in advanced and underdeveloped economies. However, this study considers the impact of urban population, economic growth, and energy usage on environmental degradation in Asian countries. As some of the Asian countries are emerging markets for providing goods and exports at the World level.

LITERATURE REVIEW

A review of some work done empirically about environmental degradation and other major causes is described in this section. Antweiler et al. (2001) showed that trade openness has increased the ecological deterioration in the economy. However, Lin and Marinova (2009) found that population had a negative effect on the environment negatively. Urbanization level and population have enhanced environmental degradation. Moreover, energy intensity and GDP per capita increased environmental degradation to a higher level. However, Ramos et al., (2010) found that the developing economies experienced much growth by using high energy and all this enhanced environmental pollution. Nevertheless, Arouri et al. (2012) also found that energy usage and growth increased pollution in American countries. Mercan and Karakaya (2015) emphasized on determinants of ecological degradation for selected eleven OECD countries. The authors measured the cross-section dependency. Results revealed that energy consumption has increased carbon dioxide emissions, while, GDP growth decreased the carbon dioxide emissions. Le et al. (2016) have examined an association between trade openness and ecological degradation. Authors have found that openness led to increased ecological degradation in the world. However, findings were different income-wise in these countries. Trade openness influenced largely the environment in rich nations, but had a damaging influence in middle- and low-income economies.

Rehman and Rashid (2017) focused on how energy consumption deteriorated the atmosphere in Asian markets. They have used the OLS technique. Results showed that the level of energy consumption increased ecological degradation. Results also showed that bidirectional causality of ecological degradation and growth. Ozcan et al. (2020) found that economic growth and energy usage increasingly contributed to high pollution in the environment in OECD countries. Khan et al. (2019) used regression techniques and the GMM model to check the determinants of environmental degradation in 193 countries from 1990 to 2007. Findings indicated that financial development, growth, and energy usage enhanced emissions. Moreover, the results showed the environmental Kuznets Curve for the global panel. Kihombo et al. (2021) focused on how scientific innovation, financial development, and growth affected the ecological footprints in West Asia and Middle East nations from 1990 to 2017. It was found that technological innovations have increased economic growth and decreased carbon emissions. However, financial development has increased ecological degradation. Similarly, urbanization contributed adversely in these countries.

Dagar et al. (2022) have used data from 1995 to 2019 in 38 OECD economies. The results showed that renewable energy consumption and natural resources led to decreased environmental degradation. It was also found that financial development, industrial production, and total reserve resulted in increased environmental degradation in OECD countries. Ehigiamusoe (2023) has examined the reasons for ecological degradation in ASEAN + China. The findings showed that economic growth, energy usage, and non-renewable energy aggravated ecological degradation, while renewable energy, foreign direct investment, and trade openness have decreased it.

METHODOLOGY

This study shows the condition of environmental degradation in Asian countries (i.e., Pakistan, Bangladesh, India, Sri Lanka, Indonesia, Malaysia, Singapore, Kuwait, Iran, and Jordan) considering macroeconomic variables like economic growth, energy consumption, and urban population. Due to the unavailability of data in some countries, we have selected these Asian countries. The dependent variable is carbon emission CO₂ which has been showing environmental degradation. Explanatory factors are economic growth, energy consumption, urban population, and financial development. Data on all these variables has been collected from the website of World Development Indicators (WDI). The fixed effect method has been used to check the influence of economic growth, energy consumption, financial development, and urban population environment pollution in selected Asian countries.

The econometric models that are utilized are assumed as:

$$CO_2 = \beta_0 + \beta_1 ENUS_{it} + \beta_2 LGDPPC_{it} + \beta_3 UPOP_{it} + \beta_4 DCPS_{it} + u_{it} \quad (1)$$

LENUS= Log of energy use per capita

LCO₂= Log Carbon Emission kt

DCPS= Domestic credit to the private sector as % of GDP

LGDPPC= Log gdp per capita

u_{it}= (error term)

RESULT AND DISCUSSION

Table 1 shows the descriptive statistics of factors being used in this research. There are large differences in data. On average environmental degradation ranges from 5.1721 to 9.9044 percent over the period 2010 - 2019. Likewise, on average energy usage is 2.9881 percent and the urban population is 7.6044 percent.

Table 1. Descriptive statistics.

Variables	Observations	Mean	Minimum	Maximum
LENUS	80	2.9881	2.2900	3.406
LCO ₂	80	5.3324	5.1721	9.9044
LGDPPC	80	10.4271	9.9090	11.4240
UPOP	80	7.6044	5.4041	7.50961
DCPS	80	34.8890	15.3861	125.062

Empirical Estimations shows that the Probability of chi² is 0.000 and the p-value by Hausman suggests fixed effects.

Table 2: Fixed effect results, dependent variable is environmental degradation.

Variables	Coefficients and t-values
LENU	0.7736* (3.92)
GDPPC	0.7157* (3.34)
UPOP	0.0046* (7.25)
DCPS	0.0012* (5.02)
Constant	0.3191 (10.65)
R-Square overall	0.89
Wald Chi2	580.77
Probability	0.0000

Note: t-values are in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

In Table 2 fixed effects are shown for the analysis. Energy consumption is an imperative factor in increasing industrialization and economic growth. However, it leads to increased environmental degradation. The study result shows that an increase in energy usage increases the environmental damage by 0.7736 % in these Asian countries. People use energy to make goods and services and in this way environment damages. Our result is inconsistent with the finding by Khan et al. (2019). Economic growth is a good indicator of economic development. But it also pollutes the environment. The study results highlighted that increased economic growth increases the pollution in the environment by 0.7157 percent. The result is supported by Ehigiamusoe (2023). Urban population also increases economic growth and development but at the cost of environmental degradation. Increased population is another way to increase pollution in the environment. The increasing urban population results in increased environmental damage by 0.0046 % in Asian countries. This is a big issue. The result is favored by Antweiler et al. (2001). Financial development enhances economic growth and development but it is also a way to environmental damage in these economies. Findings show that a one percent increase in domestic credit to the private sector increases environmental damage by 0.0012 percent in Asian countries. The study result is consistent with Khan et al. (2019).

CONCLUSION AND RECOMMENDATIONS

We have checked how energy usage, economic growth, financial development, and urban population affect environmental degradation in Asian countries. We have used the fixed effects technique to show an association between the dependent and independent variables. The study results show that pollution in the environment is because of energy consumption, economic growth, and increased urban population. It is concluded that increased usage of energy and increased urban population and goods and services have increased pollution in the environment. Moreover, financial development also resulted in increased environmental degradation in selected Asian economies. Depending on the findings, it is suggested that the Government must enhance economic growth and development in the provision of a better and improved environment. Moreover, it is the responsibility of the Government to decrease pollution by using good

energy sources in these countries. The government must have some control over pollution in these countries.

REFERENCES

- Ang, J. B. (2007). CO₂ emissions, energy consumption, and output in France. *Energy Policy*, 35(10): 4772-4778.
- Antweiler, W., Brian, C.R., Scott, T., 2001. Is free trade good for the environment? *American Economic Review* 91, 877-908.
- Arouri, M. E .H, Youssef, Adel. Ben, M'henni, H., & Rault, C. (2012). Energy consumption, economic growth and CO₂ emissions in Middle East and North African Countries. *Energy Policy*, 51: 184-191.<https://doi.org/10.1016/j.enpol.2012.02.042>.
- Dagar, V., Khan, M. K., Alvarado, R., Rehman, A., Irfan, M., Adekoya, O. B., & Fahad, S. (2022). Impact of renewable energy consumption, financial development and natural resources on environmental degradation in OECD countries with dynamic panel data. *Environmental Science and Pollution Research*, 29(12), 18202-18212.
- Ehigiamusoe, K. U. (2023). The drivers of environmental degradation in ASEAN+ China: Do financial development and urbanization have any moderating effect?. *The Singapore Economic Review*, 68(05), 1671-1714.
- Khan, S., Peng, Z., & Li, Y. (2019). Energy consumption, environmental degradation, economic growth and financial development in globe: Dynamic simultaneous equations panel analysis. *Energy Reports*, 5, 1089-1102.
- Kihombo, S., Ahmed, Z., Chen, S., Adebayo, T. S., & Kirikkaleli, D. (2021). Linking financial development, economic growth, and ecological footprint: what is the role of technological innovation?. *Environmental Science and Pollution Research*, 28(43), 61235-61245.
- Le, T. H., Chang, Y., & Park, D. (2016). Trade openness and environmental quality: International evidence. *Energy policy*, 92, 45-55.
- Lin, S. Z., & Marinova, D. (2009). Analysis of the environmental impact of China based on STIRPAT model, *Environmental Impact Assessment Review*, 29: 341-347.
- Mercan, M. and Karakaya, E. (2015). Energy consumption, economic growth and carbon emission: Dynamic panel cointegration analysis for selected OECD countries, *Procedia Economics and Finance*, 23: 587 - 592.
- Ozcan, B., Tzeremes, P. G., & Tzeremes, N. G. (2020). Energy consumption, economic growth and environmental degradation in OECD countries. *Economic Modelling*, 84, 203-213.
- Rehman, M. and Rashid, M. (2017). Energy consumption to environmental degradation, the growth appetite in SAARC nations. *Renewable Energy*, 111, 284-294,
- Xiao-wei, Ma, X, Yi, Ye. Q., Shi, X & Le, Zou, Le. (2016). Decoupling economic growth from CO₂ emissions: A decomposition analysis of China's household energy consumption, *Advances in Climate Change Research*, 7, 192-200.
- Ma, X. W., Ye, Y., Shi, X. Q., & Zou, L. L. (2016). Decoupling economic growth from CO₂ emissions: A decomposition analysis of China's household energy consumption. *Advances in Climate Change Research*, 7(3), 192-200.
- Yang, G., Sun, T., Wang, J., & Li, X. (2015). Modeling the nexus between carbon dioxide emissions and economic growth. *Energy Policy*, 86, 104-117.
- Yeh, J. C., & Liao, C. H. (2017). Impact of population and economic growth on carbon emissions in Taiwan using an analytic tool STIRPAT. *Sustainable Environment Research*, 27(1), 41-48.