ScienceDirect

Resources Policy

Volume 80, January 2023, 103136

Examining the role of sustainability and natural resources management in improving environmental quality: Evidence from Asian countries

Zeyun Li [a], Lin Woon Leong [b], Mahfod Mobarak N Aldoseri [c], Iskandar Muda [d, e], Ayman Abu-Rumman [f], Ata Al Shraah [g]

Show more

Share Cite

https://doi.org/10.1016/j.resourpol.2022.103136

Abstract

The study examines the role of natural resources in improving environmental quality in South Asia. This research focuses primarily on the energy-environmental nexus, ignoring this important region regarding environmental quality proxies and estimation approaches. As a result, the study adopts a unique approach, examining the above mentioned effects using advanced panel data estimation methods for the period 1990–2018. The findings showed that natural resource abundance is positive, indicating its role in increasing environmental degradation in these countries. Moreover, using renewable energy negatively influences the ecological footprint, meaning that it can help reduce environmental degradation in South Asia. Furthermore, the environmental deterioration in South Asia is significantly affected by growth and population, indicating that these countries pursue economic development at the price of rising emissions that harm the environment.

Overall, this research suggests that while natural resources, growing population, and economic growth both positively impact environmental quality, using renewable energy sources improves it over time. As a result, these countries need to rethink their plans and create a framework supporting long-term economic development and environmental protection.

Introduction

The macroeconomic plans of South Asian countries have mostly focused on promoting economic growth rather than environmental conservation. Most South Asian economies heavily dependent on fossil fuels to meet their specific energy needs. Fossil fuels, both domestic and imported, make up a significant portion of the energy production of these countries. Therefore, continuous dependence on fossil fuels has contributed to economic growth in many countries and resulted in extraordinary environmental problems throughout South Asia (Xue et al., 2021). Under these conditions, environmental preservation has become necessary to guarantee regional environmental sustainability. It is essential for South Asian countries that rely on fossil fuels to increase their use of renewable energy if they want to achieve the World Bank's Sustainable Development Goals (SDGs) 2030 agenda. In comparison to burning fossil fuels, the production of energy from renewable sources, especially hydropower, is believed to have less of an impact on the environment (Kuriqi et al., 2020; Suwal and Huang et al., 2020; Du et al., 2022; Gyamfi et al., 2022). As a result, switching to renewable energy could be considered a possible solution to human-caused environmental problems (Irfan et al., 2022).

The aim of switching out coal-fired power facilities with low-carbon alternatives is to lower greenhouse gas emissions. Because of this, countries in South Asia that want to maintain their electricity supply while reducing greenhouse gas emissions must consider renewable energy as a key alternative (Shukla et al., 2016). Moreover, wind and solar power are two other examples of numerous renewable energy sources that are endless. Therefore, usingrenewable energy is increasingly acknowledged as a crucial part of a comprehensive strategy to lower global greenhouse gas emissions (Ahmed et al., 2016). Because it has the potential to provide access to secure, inexpensive, and clean energy, which might foster both innovation and economic growth (Akhmat and Zaman, 2013; Liu et al., 2022c; Li et al., 2022).

The rising population and economic growth in the South Asian region have increased energy demand (Shukla et al., 2016). These countries are progressively looking for alternative energy sources, especially renewable energy, to decrease their dependency on fossil fuels and fulfill their energy demand (Salem and Kinab, 2015). These countries are considering alternative energy sources such as wind, hydro, solar, and biomass to overcome environmental degradation. Fig. 1 depicts the overall per capita ecological footprint trends in South Asian economies. The graph shows that between 1990 and 2018, the overall environmental quality deteriorated significantly in these countries. It can be seen that India has the largest total ecological footprint, followed by Pakistan, Bangladesh, and Sri Lanka in South Asia.

Renewable energy sources have great potential in South Asian countries. Renewable energy sources, such as solar, wind, and hydro, are distributed differently. India has South Asia's largest renewable energy resources, followed by Pakistan and Sri Lanka. Pakistan has many renewable energy sources, such as wind and solar. Nature and its resources are closely connected and a crucial part of the socioeconomic system, given how heavily human civilizations rely on them. People devoured natural resources more quickly than now in the early stages of economic growth and disdained environmental concerns. But when living standards rise in the latter stages of economic growth, economies start to consider environmental damage and demand renewable, friendly, and energy-efficient resources (Zafar et al., 2019). Global climate change will most likely be the most difficult environmental issue humanity faces in this century. There is solid proof thatburning fossil fuels like oil, coal, and natural gas alters the planet's temperature by releasing more CO2 into the atmosphere. South Asian countries mostly rely on nonrenewable resources for their energy needs (Razzaq et al., 2022a).

Over the past decade, mainstream research has measured environmental quality using CO2 emissions, or greenhouse gases. However, it is not enough to merely reflect on the multifaceted nature of environmental issues. This study aims to investigate the effects of natural resources (NR), renewable energy (RE), economic growth (GDP), and population (POP) expansion on the ecological footprint (EF). This study adds to the body of literature in several ways. First of all, this is novel research to examine how the utilization of RE and NR influences environmental deterioration in South Asian countries. No specific study exists that explores such an issue country-wise and as a whole in the existing literature. Second, this study employs a novel technique called Dynamic Common Correlated Effects (DCCE), which fixes the flaws in the prior methodology. The Fully-modified Ordinary Least Squares (FMOLS) are also used to assess country-level results. The literature has shown us that RE usage, NR, GDP, and population are essential drivers of environmental quality. However, there hasn't been any empirical research on how these crucial variables interact in South Asian countries, so we decided to fill this gap. The research will then summarize its major policy ramifications and offer suggestions based on its results.

The rest of the research is organized as follows: Section 2 presents a literature review, and the data and methodologyare in Section 3. Section 4 presents the findings and their discussion, and the final section offers the conclusion of the study and policy recommendations.

Section snippets

Review of literature

Over the last several decades, there have been a growing number of studies showing the effects of RE on environmental equality. In recent years, studies on the economic implications of GDP, energy consumption, and even urbanization have gained attention. Due to changes in the

data range, techniques used, proxies for variables, and national or regional characteristics, the results of this research have always produced significant variations. The findings of several investigations disagree and...

Data overview

The research looked at four countries in South Asia. The study used panel data from 1990 to 2018 from South Asian countries, namely Bangladesh, India, Pakistan, and Sri Lanka. The time frame was determined solely by data availability. The data sources and measurements of the variables are listed in Table 1....

Estimation technique

The Stochastic Impacts by Regression on Population, Affluence, and Technology (STIRPAT) model is used in this study. According to the concept, environmental deterioration is caused by both...

Estimation results

First, the CD test is examined as it is more likely to arise in panel data because of the nature of macroeconomic factors. The results of Pesaran's (2004) CD test are reported in Table 2. Based on the findings of the CD test, there is sufficient evidence to reject the null hypothesis and infer cross-sectional dependency among cross-sectional units.

The next step is to examine the findings of the panel unit root analysis. The results of the CIPS unit root test are shown in Table 3. The CIPS unit...

Conclusion

The present study explores the impact of renewable energy, natural resources, economic growth, and population on the ecological footprint in four South Asian countries for the time period 1990–2018. For econometric estimation, advanced panel data estimation techniques have been used to handle cross-section dependency and heterogeneity problems. The findings of the study confirmed a long-term association between all the variables. The findings further demonstrate that RE negatively influences EF ...

Author statement

We have revised manuscript titled **Examining the Role of Sustainability and Natural Resources Management in Improving Environmental Quality: Evidence from Asian Countries** There is no author's conflict among authors in this research. The plagiarism of this manuscript is not greater than 15%. So, this will be a good edition in existing literature....

References (102)

R. Wood *et al.*
An assessment of environmental sustainability in Northern Australia using the ecological footprint and with reference to Indigenous populations and remoteness
Ecol. Econ. (2009)

J. Wang *et al.*
What drives environmental degradation? Evidence from 14 Sub-Saharan African countries
Sci. Total Environ. (2019)

M.K. Uddin
A review on the adsorption of heavy metals by clay minerals, with special focus on the past decade
Chem. Eng. J. (2017)

G. Toth *et al.*
The historical ecological footprint: from over-population to over-consumption
Ecol. Indicat. (2016)

N. Suwal *et al.*
Optimisation of cascade reservoir operation considering environmental flows for different environmental management classes
Renew. Energy (2020)

A.K. Shukla *et al.*
A comprehensive review on design of building integrated photovoltaic system
Energy Build. (2016)

T. Salem *et al.*
Analysis of building-integrated photovoltaic systems: a case study of commercial buildings under mediterranean climate
Procedia Eng. (2015)

Y. Sun *et al.*
High-speed rail and urban green productivity: the mediating role of climatic conditions in China
Technol. Forecast. Soc. Change (2022)

Y. Sun *et al.*
How infrastructure development and technical efficiency change caused resources consumption in BRICS countries: analysis based on energy, transport, ICT, and financial infrastructure indices
Resour. Pol. (2022)

A. Razzaq *et al.*
Testing the directional predictability between carbon trading and sectoral stocks in China: new insights using cross-quantilogram and rolling window causality approaches
Technol. Forecast. Soc. Change (2022)

View more references

Cited by (0)

Recommended articles (6)

Research article

A proposed DEMATEL based framework for appraising challenges in the artisanal and small-scale mining sector

Resources Policy, Volume 80, 2023, Article 103172

Show abstract

Research article

Perceptions of local communities regarding the impacts of mining on employment and economic activities in South Africa

Resources Policy, Volume 80, 2023, Article 103138

Show abstract

Research article

Revenue sources of natural resources rents and its impact on sustainable development: Evidence from global data

Resources Policy, Volume 80, 2023, Article 103226

Show abstract

Research article

What drives sustainable development? Evaluating the role of oil and coal resources for selected resource rich economies

Resources Policy, Volume 80, 2023, Article 103078

Show abstract

Research article

Multifractality and cross-correlation between the crude oil and the European and non-European stock markets during the Russia-Ukraine war

Resources Policy, Volume 80, 2023, Article 103134

Show abstract

Research article

Study on policy synergy strategy of the central government and local governments in the process of coal de-capacity: Based on a two-stage evolutionary game method

Resources Policy, Volume 80, 2023, Article 103132

Show abstract

View full text