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Editorial: Socioeconomic transition and environmental footprints

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Editorial on the Research Topic

Socioeconomic transition and environmental footprints

The Earth system has been impacted in unprecedented ways by rapid socioeconomic development since the entry into the Anthropocene. Therefore, it has become essential to understand the complex relationship between socioeconomic development and the natural environment. One of the methods, used to track the effect of human activities on the environment, is environmental footprint assessment. Since this method was introduced, environmental footprints indicators have been applied to measure the impact of human activities on various types of resources, such as water, carbon, nitrogen, phosphorus, etc., (Cui et al., 2022; Li et al., 2023).

Analysis of environmental footprints plays a vital role in quantifying the environmental impact of human activities on the Earth system and prioritizing actions that will advance the achievement of the UN Sustainable Development Goals (SDGs). Socioeconomic transitions, such as industrial transformation, energy transition, human migration, and dietary changes; may have a significant effect on environmental footprints (Wei et al., 2020; Liang and Zhong, 2023). Therefore, identifying how socioeconomic factors affect the environmental footprints is crucial, to form policies that will mitigate the anthropogenic impact on the regional and global scale, thus helping accomplish SDGs.

The dependence on fossil fuels for economic growth has resulted in an increase in CO₂ emissions. Increased economic growth and urbanization require more stringent environmental policies to balance energy demand and carbon emissions. Talib et al. examines the non-linear effect of economic growth and urban dynamics on environmental degradation in a comprehensive panel data of 66 countries and across respective income groups for the period 1990–2016. The study reveals the bell-shaped effect of economic growth on environmental degradation, as well as the inverted U-shaped impact of urbanization and urban agglomerations on CO₂ emissions. The empirical findings also reveal the heterogeneous non-linear effects of urban dynamics across different income categories of selected economies. Additionally, by employing heterogeneous Dumitrescu and Hurlin (D-H) (Granger non-causality test) and establishing significant unilateral and bilateral causality of structural change and urban dynamics with environmental degradation. This study emphasizes the important role of eco-friendly industrial and energy policies in achieving long-term social, economic and environmental sustainability.

Renewable energy has a key role to play in stabilizing economic growth and mitigating climate change, yet achieving a socio-ecological balance still requires technological innovation, financial development, and structural optimization of energy consumption. Using an autoregressive distributive lag (ARDL) model spanning the period 1990–2017, [Wen et al.](#) investigated the role of public-private partnership investment (PPPI) on the ecological footprint (EF) of the South Asia and Pacific region in terms of energy and transportation, financial development, and renewable energy. The study helps decision-makers in developing countries to formulate policies for economically and ecologically sustainable development.

Environmental degradation is increasing within countries, but in the context of economic globalization, environmental problems does not always occur independently, and the economic linkages between countries make it necessary to pay more attention to the coordination of the producers and the consumers in combating environmental impacts. [Zhang and Han](#) provides new insights into the drivers of carbon emissions decoupling from both production- and consumption-based perspectives. Based on the multiregional input-output model and the Tapio decoupling decomposition, the study quantitatively analyze the decoupling evolution and decomposition drivers of economic activities and carbon emissions in the countries along the Belt and Road. The results show that developed economies with advanced technology and optimized industries tend to maintain a stable and strong decoupling of carbon emissions, while developing countries and emerging economies with a large number of low-end manufacturing industries have a more fluctuating decoupling. Fossil energy combustion associated with economic development is a major contributor to carbon emissions. This study emphasizes that practical strategies for energy restructuring and harmonization of development patterns are essential for the construction of the Green Silk Road.

The regional heterogeneity of resource endowment and technology level makes high-spatial-resolution environmental impact analysis a trend. Environmental and economic impacts play an important role in regional industry development. [Wang](#) measures the quality of green development in the construction industry in two-dimensional space-time based on a panel data of construction industry development in 31 provinces from 2006 to 2020, focusing on regional differences, dynamic evolutionary trends and distributional convergence. The study emphasizes the importance of scientific and technological inputs, human capital inputs, and green construction models in transforming of China's construction industry to green and high-quality development.

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The Research Topic on Socioeconomic Transition and Environmental Footprints provides valuable recommendations for achieving long-term social, economic and environmental sustainability in the face of socioeconomic change. The Research Topic expands the scope of environmental impact studies by analyzing the environmental footprint of social metabolism and its organic integration with socio-economic transformation extensively. Nesting socio-economic development and the natural environment within each other at the industrial, regional and trade levels contributes to the realization of efficient economic development, equitable societies and sustainable environments for future human wellbeing as well as an ecologically functional and diverse planet. The various studies presented here focus on the complexities and conflicts between a particular environmental aspect and socio-economic transformation. We believe that by adopting a multi-model decision-making approach as well as multidisciplinary integration, it is possible to harmonize socioeconomic transformation with environmental cutbacks to form a society centered on human wellbeing and ecological and environmental protection.

Author contributions

KH: Writing—original draft. LL: Writing—review and editing. ZW: Writing—review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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