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Editorial: The nexus between the transportation sector and sustainable development goals: Theoretical and practical implications

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Editorial on the Research Topic
The nexus between the transportation sector and sustainable development goals: Theoretical and practical implications

The most important issues at the forefront of world public opinion, especially in the last 20 years, are undoubtedly global warming, environmental degradation, and sustainable development, together with their important political, social, cultural, and demographic underpinnings.

The common concern of scientists, politicians, the business world, and relevant other stakeholders is that today's relations of consumption and production are no longer environmentally sustainable.

To prevent these problems, the United Nations (UN) took some important decisions. Among these, the contribution of the transportation sector to the current environmental problems is a central one that the Sustainable Development Goals (SDGs) address.

Abundant literature has developed on the relationships between energy consumption, environmental pollution, maritime transport, and economic development (Mele et al., 2021; Magazzino et al., 2020), green transport and environmental expenditure (Hussain et al., 2021), health, transport and environment (De Maria et al., 2021) and urban environment and public transport system (Alonso et al., 2020).

Specifically, 8 papers were selected and published on this Research Topic which was contributed by 27 authors around the world. The research directions of these papers were the hot spot in the current subject of Sustainable Development Goals and the Transportation Sector.

Sun et al. explored the industrial agglomeration in China's prefecture-level and cities from 2010 to 2020. Empirical findings show that the agglomeration of the labor force is positively affected by the construction of urban rail transit infrastructure. Moreover, the

development of railway infrastructure stimulates the agglomeration of manufacturing industries in and near urban population centers leading to the development of services industries. The development and integration of railway networks with other transportation networks also optimize the allocation of capital in these areas as well.

Cai et al., using panel data on Chinese prefecture-level cities from 2008 to 2018, analyzed the spatial spillover effect of high-speed railways on urban consumption through a spatial econometric model. The results show a positive spatial dependence on China's urban consumption level, and the spatial correlation shows an upward trend year by year. In addition, the high-speed rail network has a positive effect on local urban consumption, and at the same time, it affects urban consumption in adjacent areas through the spatial spillover effect.

Yu and Wan followed panel data on Chinese cities from 2000 to 2018, considering the opening of high-speed rail as a quasi-natural experiment. Findings indicate that high-speed rail plays a significant role in promoting urban green innovation and that the spatial spillover effect is substantial. Also, high-speed rail has an inverted U-shaped trend in promoting urban green innovation, and the optimal radius is 200 km from the nucleus city.

Alnour studied the dynamic connection between renewable energy, environment-related technological innovation, and transport-based CO_2 emissions in Turkey from 1990Q1 to 2014Q1 by applying Structural Vector Autoregressive (SVAR) model. The results highlight that environment-related technological innovations have no reliable power in explaining the variation in CO_2 emissions from the transport sector. Solar energy is found to positively impact CO_2 emissions in the long-run, while biofuels hold the same effect in the short-run. Moreover, per capita GDP and urbanization significantly impact the carbon emissions from the transport system in the long-run with, a negative sign.

Bhowmik et al. employed a Panel Quantile Regression (PQR) approach to investigate the impact of CCMT on COE in low, middle, and high-emission countries. The result shows that climate change mitigation technology related to the transport sector (CCMT) does not affect Carbon emissions from the transport sector (COE) at the lowest quantile (i.e., 10th quantile) while CCMT plunges the emissions at all other quantiles.

Johnson et al. explored the science-policy interface between Fauna-sensitive road design (FSRD) and transport infrastructure planning. They provided a Systematic Quantitative Literature Review (SQLR) of international literature to identify the biodiversity concerns acknowledged in transport planning policy, as well as the barriers to the adoption of environmental policies within transport planning. The review identified multiple ecological support tools available to transport policy- and decision-makers.

Su et al. examined the theoretical framework at the forefront of multinational supply chain sustainability development. The paper introduced and unifies three theoretical frameworks; contingency theory, innovation diffusion theory, and resource advantage theory. They analyzed how sustainable logistics service providers' supply chain cooperation might drive the sustainable transformation of suppliers in developing nations. This study demonstrates that the sustainable practices of logistics service providers are the foundation for influencing the collaboration of suppliers in developing nations concerning sustainability.

Wang et al. used the Data Envelopment Analysis (DEA)-Malmquist model to measure China's provincial transportation Green Total Factor Productivity (GTFP) from 2006 to 2019, using the modified gravity model and the Social Network Analysis (SNA) method It is found that: (a) The tightness of the spatial associated network of China's transportation GTFP increased year by year, and the hierarchical spatial structure was gradually broken. (b) There are significant differences in the status of various regions in the spatial network. (c) Spatial aggregation analysis shows that block-I has a strong correlation with other regions, while the spatial correlation level of the other three plates is relatively poor. (d) QAP analysis shows that province adjacency, per capita GDP, and technological innovation have a significant positive impact on the spatial correlation.

Studies show why the transportation sector has an important place in sustainable development goals. The 2030 Agenda states that "sustainable transport systems, along with universal access to affordable, reliable, sustainable and modern energy services, quality and resilient infrastructure, and other policies that increase productive capacities, would build strong economic foundations for all countries" (Slocat, 2022). While the transportation sector positively affects the urbanization process, the development in the industry and services sector, and economic growth, it can have negative environmental effects on the other hand. Policymakers should urgently consider and implement policies and incentives that can minimize transport-related environmental degradation. The use of solar, wind, and biomass energies and/or clean electrical energy instead of fossil fuels, especially in land and air transportation, will significantly reduce carbon dioxide emissions in the transportation sector. Researches show that especially wind and solar energies are among the leading energy sources in reducing emission volume (Kuşkaya et al., 2022; Kuşkaya 2022).

Future studies should also examine the interactions between SDGs, the transport sector, and transport sector

policies through different methods and focus on the extent to which policies are implemented. In addition to panel data studies, studies should also include Spatial data studies to see direct and indirect effects, and should also consider time-frequency method analyses by making use of time series with a high-frequency range to observe interactions that may occur at different times and frequencies.

Author contributions

FB and CM wrote this editorial note. All authors edited the final text and contributed to the article and approved the submitted version. The authors listed made a substantial, direct, and intellectual contribution to the work.

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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