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Editorial: Environmental waste and renewable energy optimization for the sustainable development goals achievement

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Editorial on the Research Topic

Environmental waste and renewable energy optimization for the sustainable development goals achievement

1 Introduction

The quest to achieve the United Nations (UN) sustainable development goals (SDGs) agenda 2030 is the hope and dream of every nation globally. The 17 SDGs adopted by the UN member states in September 2015 broadly address three significant Research Topic—countries' economic, social, and environmental welfare. Achieving these primary goals was a considerable challenge due to several factors, notably pandemic, insecurity, and environmental degradation. The insecurity created by some groups of movement in some parts of the world is affecting the agricultural system whereby farmers cannot farm, thereby creating food insecurity (Goal 2: End hunger, achieve food security, improve nutrition, and promote sustainable agriculture) of SDGs. People's actions and lifestyles must be changed to achieve sustainable development. Several current activities, such as energy from non-renewable, fossil sources, are unsustainable.

Moreover, they create severe environmental negative impacts on terrestrial habitats. Human actions such as municipal solid waste disposals, dumping refuse into the seawater, etc., significantly affect the ecosystem. Mathematical optimization and statistical analysis methods have helped support micro-and macroeconomic decision-making. With the support of today's computer power, large-scale mathematical models can deal with real-world data and guide practitioners to operate their respective systems in a more brilliant, more sustainable way.

The nature of the problem attracts several researchers in this domain. Since the targeted year (2030) is approaching soon, the need to devise some approaches to measuring these goals and explore possible working policies that will guide SDGs' fast-tracking and optimal achievements. To this end, this Research Topic dwells on research on environmental waste management and renewable energy sources. It explores its potential to bridge the gap and suggests a guiding policy for the proper implantation.

1.1 Aims and scope of the research topic

The main aim of this Research Topic is to develop some new approaches for the enhancement of SDGs. Reduction of food waste (target 12.3) waste services prominently feature in the targets and indicators of both SDG 11 and SDG 12, notably with commitments to prevent, reduce, recycle, and reuse—as well as to properly collect and discharge—urban solid waste and halve global food waste by 2030; and to handle appropriately and treat chemical and other hazardous waste. This Research Topic provides a valuable compendium of several challenging problems in SDG-related Research Topic.

2 Selected papers in this research topic

Thanks to the great support from Editor-in-Chief Professor Martin Siegert, and the dedicated work of numerous reviewers, we could accept eight excellent articles with thirty-six authors covering various Research Topic of UN SDGs.

Decreasing food waste is an important contribution to the practical achievement of the Sustainable Development Goals of the United Nations. An in-depth literature review for food waste management was proposed by Oláh et al. summarized recent publications and put their results into a development context. They applied the triangulation method by analyzing the food waste-based literature from epistemological development, structural composition, and scientometric mapping for SDG.

The green economy (GE) concept is believed to have the ability to turn natural resources into wealth sustainably. As a result, the GE concept is viewed as a magic key to the attainment of sustainable development goals (SDGs) stated by Karuppiah et al. model identified and evaluated the critical factors in GE practices. Based on the literature review and industrial interaction, five dimensions of essential aspects, namely, economic and market, technical and R&D, policy and regulation, networks and social capital, and public perceptions, with a total of 20 critical factors, were identified and evaluated through this study. Three crucial factors are classified under the cause category, and the remaining 17 come under the effect category. They solved their model using the Fermatean fuzzy system-based decision-making trial and evaluation laboratory (DEMATEL) technique.

Qu et al. introduced Material Flow Cost Accounting (MFCA) method into the budgeting process of manufacturing firms and thus constructed an MFCA-ABB (Activity-Based Budget) model. They proposed a case study from JLC company, a fragrant liquor

manufacturing company in China. The proposed MFCA-ABB model turned a pure operating budget into an environmental-economic budget. Therefore, Qu et al. model achieved both environmental and economic benefits for the company. Besides, this study applied ABB in environmental management accounting, which suggested the possibility of using the conventional management accounting tools, after modification, to the environmental-economic management of manufacturing firms in the future.

Before planning to equip buildings with energy systems, it is essential first to understand and control the behavior of the premises (*via* control of heat and water transfer phenomena) (air conditioners, heat pumps, heat exchangers, etc.). The heat and mass transfer through a ceiling wall containing micro-encapsulated phase change materials under realistic climatic conditions based on meteorological data in Tunisia was proposed by Lajimi et al. This study was conducted based on numerical data to predict the effect of incorporating a layer of PCM on thermal behavior, mass, occupant thermal comfort, and energy consumption for summer and winter periods.

Zhao et al. analyzed the influence of environmental regulations on meat duck farmers' environmentally friendly behavior from the perspective of the "cost effect" and "Porter effect." Zhao et al. explored the potential role of risk perception by analyzing the heterogeneity of farmers' environmentally friendly behavior at different breeding scales. They proved an inverted U-shaped relationship between the intensity of environmental regulations and meat duck farmers' environmentally friendly behavior; various environmental regulations significantly affect the environmentally friendly behavior of farmers.

The consumption of single-use plastics, such as disposable tableware (DTW), conveys a high benefit-cost ratio for consumers while having significant environmental externalities stated by Kaufmann et al. focused on the Israeli ultra-Orthodox communities, a private population group that grows much faster and consumes much more disposable tableware than the rest of the Israeli population. They used 450 quasi-representative samples to conduct their study and concluded that it integrates latent constructs such as the respondents' environmental attitudes and level of conservativeness. Kaufmann et al. suggested that Nudges can enhance policies to encourage pro-environmental behavior among faith-based communities.

Nur et al. examined the critical attributes required for the effective and efficient deployment of Emerging technologies (ETs). They used the Fuzzy-TODIM (Portuguese abbreviation of "Interactive and Multi-Criteria Decision Making") method to rate the importance of the attributes. They conclude that "Inventory and Resource Management" tops the attribute list responsible for exploiting the optimal usage ETs, followed by "Development of Skilled Workforce" and "Supplier and Service Management Capability," respectively.

Text mining and the Policy Modeling Consistency (PMC) Index model was used by Xu et al. to develop an evaluation system of Municipal Solid Waste sorting management policies. Xu et al. conducted their study for eleven major cities in China. Xu et al. provided a fresh viewpoint on the waste sorting management

policy evaluation. They offered some insight for policymakers, who should pay attention to waste separation, focus on key policy indicators, and enhance the policy response's effectiveness. They also discussed the applicability of the evaluation model and the difficulties associated with the waste sorting governance of China in post-epidemic.

3 Conclusion

This editorial presented some aspects of the SDGs relevance, including technology, organizations and people, and the impacts during emergency situations and environmental uncertainties. People's actions and lifestyles must be changed to achieve sustainable development. Several current activities, such as energy from non-renewable, fossil sources, are unsustainable. They create severe environmental negative impacts on terrestrial habitats. Human actions such as municipal solid waste disposals, dumping refuse into the seawater, *etc.*, significantly affect the ecosystem. Mathematical optimization and statistical analysis methods have helped support micro-and macroeconomic decision-making. Finally, we provide some insightful research directions considering scholars, practitioners, and government.

Author contributions

IA, BS, SMA, and AF, wrote the first draft of the article. IA and BS, supervised and edited the paper.

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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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