



Sustainable Production and Consumption

Special issue – Call for papers

Sustainable Economic and Financial Solutions to Climate Change: The Role of Artificial Intelligence, Big Data and Machine Learning

Recently, the growing use of artificial intelligence (AI), big data (BD) and machine learning (ML) has become subject of heightened debate. In this regard, the United Nations Environmental Programme (UNEP) has highlighted ways through which AI can be used to tackle global societal challenges – particularly the nature and biodiversity loss, and pollution and waste – some of key catalysts of climate change. To this end, in 2022, the UNEP launched the so-called World Environment Situation Room, a digital platform that leverages AI's capabilities to gather, aggregate, visualise and interpret complex and multifaceted datasets.¹

Thus, AI, BD, and ML are emerging as powerful tools that can revolutionize the way we tackle climate change by providing data-driven insights, optimizing decision-making processes and facilitating the development of sustainable economic and financial strategies.

Although it is broadly agreed that AI is uniquely positioned to tackle global societal challenges, no consensus has been reached so far in the academic literature as to the mechanism that transforms BD into sustainable economic and financial solutions to climate change. Within this thin body of research, Vinuesa et al. (2020) find that AI can enable the establishment of 134 targets across the 17 United Nations Sustainable Development Goals; however, AI can also inhibit 59 targets. Focusing on the environmental targets (i.e., climate action, life below water and life on land), there is evidence that: a) AI supports understanding of climate change and extrapolating its impacts, b) AI supports low-carbon energy systems, and c) AI can improve the health of ecosystem (Vinuesa et al., 2020). Moreover, Oluleye et al. (2023) highlight the role of AI in promoting circular economy practices in the building construction industry. Along similar lines, Schöggel et al. (2023) underscore BD and AI as two key enabling digital technologies for a sustainable circular economy. It is also worth mentioning that Boston Consulting Group surveyed over 1000 leaders of both public and private companies from 14 countries regarding the role of AI in fighting climate change. The results of this survey show that AI can be employed to i) gather complex data on emissions and climate effects, ii) strengthen planning and decision making, iii) optimize processes, iv) support collaborative ecosystems and v) encourage climate-positive behaviours.² Further, it is asserted that climate change needs to become a major consideration within AI policy to address technology-specific opportunities and risks (Kaack et al., 2022).

Against this background, the aim of this special issue is to advance our understanding of the potential channels through which AI, BD and ML can be used by businesses and their stakeholders to achieve sustainable business (and societal) outcomes, which are instrumental in the measurement of the

¹ <https://www.unep.org/news-and-stories/story/how-artificial-intelligence-helping-tackle-environmental-challenges>

² <https://www.bcg.com/publications/2022/how-ai-can-help-climate-change>

impact on climate change as well as mitigation of and adaptation to climate change effects. We welcome high-quality scholarly articles that seek to answer the following (non-exhaustive) research questions:

- RQ1.** How can AI, BD, and ML inform and lead sustainable business practices, strategies, policies and outcomes?
- RQ2.** What is the role of AI, BD, and ML for the key stakeholders (employees, customers, investors, suppliers, consumers, communities, and policy makers) in steering companies in the direction of sustainable business outcomes?
- RQ3.** What is the importance of AI, BD, and ML for environmental, financial regulators and governments in achieving sustainable business outcomes?
- RQ4.** What is importance of AI, BD, and ML for financial institutions and markets in driving sustainable growth at the company, industry, and economy levels?
- RQ5.** How can AI, BD, and ML assist financial institutions and markets in the measurement, prevention and management of climate change risks?
- RQ6.** How can AI, BD, and ML improve the accuracy and precision of climate change prediction models and what potential impact can this have on financial decision making?
- RQ7.** What is the role of legislation in ensuring that AI and BD are used responsibly and ethically in achieving sustainable business outcomes?

Scholars are encouraged to use a range of methods, including but not limited to experiments, surveys, econometrics, as well as simulation, equilibrium, optimisation, and analytical models. Application of life cycle thinking is strongly encouraged. All papers must show a clear relevance to sustainable production and/or consumption to be within the scope of this journal.

This is an open call for research articles.

We also encourage the participants of **the 2023 International Conference on Sustainability, Environment, and Social Transition in Economics and Finance (SESTEF 2023)**, <https://sestef2023.sciencesconf.org/>, jointly organised by **University of Southampton, Audencia Business School, Paris School of Business, and Université Paris 1 Panthéon-Sorbonne** – which will take place on from **14-16 December 2023 in Southampton, UK** – to submit their high-quality and original research papers.

Submission instructions

Authors should submit articles via Editorial Manager® for *Sustainable Production and Consumption* at <https://www.editorialmanager.com/spc/> following the Guide for Authors available at <https://www.elsevier.com/journals/sustainable-production-and-consumption/2352-5509/guide-for-authors>. Within Editorial Manager, they should select the special issue "SI: AI, BD & ML". Manuscripts submitted after the deadline may not be considered for the special issue and may be transferred to a regular issue. All articles will be subject to a rigorous review process and accepted papers will be published online as soon as accepted.

Deadline for submissions: 31st May 2024

Special issue editors

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