

ECOLOGICAL PERSPECTIVES FOR SCIENCE AND SOCIETY ÖKOLOGISCHE PERSPEKTIVEN FÜR WISSENSCHAFT UND GESELLSCHAFT

CONTENTS S1 | 2023

EDITORIAL

1 Ortwin Renn How sustainable is the digital world?

MAGAZINE

4 12 QUESTIONS TO ... Eckhard Störmer

INTRODUCTION

 Matthias Barth, Maike Gossen, Daniel J. Lang, Tilman Santarius
 Sustainable digitalization – fostering the twin transformation in a transdisciplinary way

RESEARCH

- 10 Mario Angst, Nadine Strauß Discourses surrounding sustainability and digitalization in Europe on Twitter over time
- 21 Tilman Santarius, Josephin Wagner
 Digitalization and sustainability: A systematic literature
 analysis of ICT for Sustainability research

COVER PICTURE

This visualization features a common vision of a city of the future: a skyscraper megacity with the icons for Wi-Fi, Internet, public transport, etc., superimposed to symbolize information and networked technologies and digital data flows. Since the millennium, the idea of smart cities has been thriving, promising to solve urban development problems through digitalization, and thus make cities more efficient and sustainable. However, whether smart city strategies have a positive or negative impact on sustainability is highly debated. We need to ask ourselves why narratives of digitalization and sustainability are so often connected with smart megacities and skyscrapers. Is this a future we really wish for? We should keep in mind that with the projection of our ideas and hopes of the future we both open and close spaces of opportunities for a sustainable transformation of our societies.

© shutterstock id 520499128/Vasin Lee

- 33 Matthias Gotsch, Nicholas Martin, Elisabeth Eberling, Saeideh Shirinzadeh, Dirk Osiek The contribution of data science applications to a green economy
- 40 Dominik Piétron, Philipp Staab, Florian Hofmann
 Digital circular ecosystems: A data governance approach
- 47 Florian Koch, Sarah Beyer, Chih-Yu Chen
 Monitoring the Sustainable Development Goals in cities:
 Potentials and pitfalls of using smart city data
- 54 Frank Othengrafen, Lars Sievers, Eva Reinecke
 Using augmented reality in urban planning processes.
 Sustainable urban transitions through innovative
 participation

FORUM

- 64 Stefanie Kunkel, Frieder Schmelzle, Silke Niehoff,
 Grischa Beier
 More sustainable artificial intelligence systems through
 stakeholder involvement?
- 71 Maike Gossen, Otmar Lell
 Sustainable consumption in the digital age. A plea for a systemic policy approach to turn risks into opportunities
- **76 LEGAL NOTICES**



SPECIAL ISSUE: SUSTAINABLE DIGITALIZATION – FOSTERING THE TWIN TRANSFORMATION IN A TRANSDISCIPLINARY WAY

Modern societies are shaped by digitalization and challenged by sustainability transformations. The question of how digitalization can support a green transformation has become more and more common in public discourse, scientific research and political agendas. At the same time, direct environmental harm caused by digitalization, as well as its contribution to the promotion of unsustainable lifestyles, is critically discussed. Moreover, digitalization not only affects environmental sustainability. Issues of data governance and innovative forms of participation are controversial topics in digitalization and social sustainability. In this special issue, theoretical and empirical papers are presented that aim to address digitalization and sustainability in an integrated way. The collection connects scientific and political discourses and provides both analysis and recommendations for action.

Supported by



The GAIA special issue Sustainable digitalization – fostering the twin transformation in a transdisciplinary way was supported by the Robert Bosch Stiftung (grant number: 01000541-001). The funding from the Robert Bosch Stiftung was awarded to Leuphana University of Lüneburg, which organized the collaboration with GAIA.