# Preface

A multidisciplinary approach towards sustainable development in Industry 5.0 includes exploring the different innovative ways of delivering economic, social, and environmental sustainability values without compromising any forms of human sustainability values in a sustainable economy. This book showcases the multiple pathways for delivering sustainable development values across different sectors in Industry 5.0 to address the socio-environmental issues such as climate change, energy consumption, waste production, threats to public health, poverty, social exclusion, management of natural resources, loss of biodiversity, and land use that have posed a serious challenge to sustainable development globally. A holistic approach is required to achieve economic sustainability without compromising human, social, or environmental sustainability.

*Eco-Innovation and Sustainable Development in Industry 5.0* conscientize the stakeholders across various sectors of the global economy about the socio-environmental issues in Industry 4.0 and showcase the multiple pathways for sustainable application of artificial intelligence, thereby reintegrating a human-centric production systems and responsible consumption in Industry 5.0. This book serves as a useful and reference material for students, practitioners and policymakers who are interested in exploring plausible pathways of advancing eco-innovations in various industries for sustainable development in Industry 5.0 and beyond. This scholarly work is essential in achieving the United Nations Sustainable Development Goals (SDGs). For example, SDG8 is about "decent work and economic growth", SDG12 "responsible consumption and production", and SDG13 "climate actions", which encourage stakeholders to take urgent action to combat climate change and its impacts on sustainability in Industry 5.0.

## OBJECTIVE OF THE BOOK

The scholarly value of this publication is based on the need for eco-innovation and sustainable development in Industry 5.0. Also, there is a need to provide an elaborate discussion on nurturing sustainability in Industry 5.0 through eco-conscious consumption and innovative eco-friendly solutions across various sectors in Industry 5.0. This book also promotes the need for workforce sustainability, sustainable supply chain management, sustainable entrepreneurship, and entrepreneurial education for renewable energy in Industry 5.o. The book provides a basis for sustainable production and consumption as a way of promoting pro-environmental behaviour in Industry 50.

This publication is a qualified reference book for its target market and constituents, by expanding knowledge in circular business models, sustainable production and consumption, organizational development (OD), and social and environmental sciences. The topics not only facilitate the benchmarking of

sustainable development policies in Industry 5.0 but also assist conventional and corporate universities in meeting SDGs. It will also aid the institutions of management education to focus on developmental programs essential for responsible business solutions and sustainability in Industry 5.0. The book provides guidelines for policymakers in designing, implementing, and delivering sustainable values in Industry 5.0. This book serves as a reference material in the fields of management sciences, social and environmental sciences, as well as applied sciences (e.g., industrial engineering).

## TARGET AUDIENCE

The primary intended audience is scholars and practitioners who have the need for qualified reference material regarding the subject matter of the proposed publication, as outlined above. The secondary intended audience is managers, organization development specialists, consultants, educationalists, policymakers, and undergraduate and graduate business students who require the same reference material.

## TOPICS DISCUSSED IN THE BOOK

- Nurturing Sustainability in Industry 5.0
- Eco-Conscious Consumption
- Sustainable Entrepreneurship
- Sustainable Values
- Entrepreneurial Education and Renewable Energy in Africa
- Technological Innovation Infrastructure Systems
- Environmental sustainability Regulations
- Wellbeing-Oriented Economic Paradigms
- Sustainable Development
- Circular Business Models in Industry 5.0
- Blue Wind Energy for Sustainable Urbanization
- Smart Energy Management in Industry 5.0
- Bridging Industry 5.0 with Location Science and Geospatial Intelligence
- Sustainable Supply Chain Management
- Sustainability in Textile Industry
- Innovative Eco-Friendly Solutions in the Packaging Industry
- Integrating Digital and Human Labor for Sustainable Production
- Organizational ecological innovation

## ORGANISATION OF THE BOOK

This book is structured into 14 chapters. A brief description of each of the chapters featured in the book is presented below:

Chapter 1, "Eco-Conscious Consumption: Nurturing Sustainability in Industry 5.0," explores the pivotal role of sustainable consumption and the heightened consumer awareness of eco-friendly products

in Industry 5.0. The authors analyze the current trends and future projections to probes into the evolving landscape of consumer choices, emphasizing the need for eco-innovation to drive sustainable development in Industry 5.0. The chapter analyzed the challenges and opportunities ahead, offering insights for businesses and policymakers to navigate the dynamic intersection of various industries in promoting eco-innovation, and environmental consciousness for sustainable development in Industry 5.0.

Chapter 2, "Sustainable Entrepreneurship for Delivery Circular Values in Africa," draws insights from the triple nexus theory to examine how African diaspora entrepreneurship can foster sustainable entrepreneurship and embody circularity in Africa. Using a desktop research design and a case study method to examine African diaspora entrepreneurship support organisations. Results show that sustainable entrepreneurship entails innovative projects that go beyond societal, humanitarian, economic, and environmental concerns. African diaspora entrepreneurs demonstrate proficiency in Industry 5.0 and ability to effectively integrating human labor with machine capabilities. The chapter holds that embracing the intuitive features of the African diaspora to fully leverage its potential for sustainable entrepreneurship in Africa.

Chapter 3, "Entrepreneurial Education and Renewable Energy in Africa," establishes the concern that exists regarding environmental sustainability and energy accessibility, availability, and security in Africa's renewable energy sector pointing out the opportunities and challenges. This chapter delves into the critical intersection of entrepreneurial education relating to renewable energy in the African context. With the increasing global emphasis on sustainable development and the urgent need to address energy challenges, Africa stands at a pivotal juncture where innovative solutions are essential to foster growth towards greener and more resilient energy systems and consequently bridge the gap between Africa's development drive and the required energy level for sustainable production systems.

Chapter 4, "Technological Innovation Infrastructure Systems and Environmental Sustainability Regulations," positions that the technological innovation infrastructure in organizations has a positive relationship with environmentally sustainable regulations to improve the contribution of companies with an impact on the efficiency of green sustainable development. The chapter concluded that the technological innovation infrastructure systems will enhance the efficiency of innovation supported by environmentally sustainable regulations in Industry 5.0.

Chapter 5, "Wellbeing-Oriented Economic Paradigms for Sustainable Development," examines sustainable economic growth through a well-being approach, which is crucial for future prosperity. The study compares economies using a well-being model against others based on income levels, analyzing 8 well-being indicators based on data collected from 70 countries. By adopting robust statistical approaches like non-parametric ANOVA, Kruskal-Wallis H test, and Mann-Whitney U test for detailed comparison, results show marked differences in happiness, political stability, and corruption perception among groups. This study highlights the effectiveness of the well-being economy model, offering valuable insights for policymakers and scholars in their quest for sustainable development in Industry.

Chapter 6, "Circular Business Models in Industry 5.0," unpacks the intersection of Circular Business Models and Industry 5.0 to promote the need for responsible production and consumption. It showcases a holistic approach that addresses the cultural, regulatory, economic, and technical barriers.

Chapter 7, "Bridging Industry 5.0 with Location Science and Geospatial Intelligence," embarks on an extensive exploration of this novel approach to the multifaceted challenges of sustainable urbanization. This chapter provides valuable insights into the trajectory of energy systems that align with the principles of Industry 5.0, which aspire to pave the way for a greener, more intelligent and sustainable urban energy landscape for sustainable production of goods and services.

Chapter 8, "Bridging Industry 5.0 with Location Science and Geospatial Intelligence," explores the intersection of Industry 5.0 and geospatial science highlighting the key requirements for the integration of geospatial science in Industry 5.0. It also showcases how advancements in location intelligence technologies are reshaping industries, enhancing operational efficiency, and driving sustainable development. Such technological innovations range from smart cities to precision agriculture, the integration of geospatial data and analytics revolutionizes how organizations optimize workflows, mitigate risks, and deliver value in an increasingly interconnected world.

Chapter 9, "Sustainable Supply Chain Management and Industry 5.0," examines the intricate relationship between sustainable supply chain management and Industry 5.0. It emphasizes the broader context of sustainable development by examining the challenges and opportunities arising from technological advancements in artificial intelligence, automation, big data, and the Internet of Things. The chapter shed light on how supply chain practices can align with economic, social, and environmental sustainability to create values amid the intensification of socio-environmental issues and the increasing prevalence of Industry 5.0.

Chapter 10, "Building Sustainability in Textile and Apparel Supply Chains," provides a thorough analysis of seven critical requirements for an effective supply chain model to meet the triple bottom line. These include reduction in textile waste and emissions, reduction in energy intensity, maximum usage of renewable and sustainable energy resources, reuse and recycling of materials, measurement, and assessment of the impact of the supply chain on the ecosystem, standard measuring procedures evaluating the sustainability performance of an organization and environmental consciousness permeating the organizational culture.

Chapter 11, "A Comprehensive Review on Indian Textile Heritage for Sustainability," examines Indian textile culture and sustainability. This chapter emphasized the importance of local textiles and indigenous materials in regional economy and cultural identity. The evaluation considers technological obsolescence, economic sustainability, promising trends and innovations, technological integration, modern adaptations, international collaborations, and the importance of awareness and advocacy in preserving India's rich textile history.

Chapter 12, "Innovative Eco-Friendly Solutions for Sustainability in the Packaging Industry," analyzed the eco-innovation of the packaging industry to comprehend how technological capabilities, organizational capabilities, managerial knowledge of the environment, and human capabilities all play a role in the successful application of ecological design innovation in packaging and its effects on environmental sustainability.

Chapter 13, "Integrating Digital and Human Labor for Sustainable Production," unpacks the need for sustainable production systems in Industry 5.0, which necessitates the current demand for a human-centric technological application in various industries. The chapter explores plausible pathways for integrating digital and human labor in business operations using a narrative literature review approach and the abductive reasoning method. This chapter showcases the importance of designing technologies that enhance human capabilities, promote inclusivity, and mitigate potential adverse effects on workforce sustainability and employment generation. A set of principles was proposed for sustainable production systems in Industry 5.0.

Chapter 14, "Organizational Ecology and its Implications on Organizational Ecological Innovation," analyzed the major organizational ecological innovations leading to technical changes that are pioneered by entrepreneurial organizations shedding lights on the positive relationship that exists between organizational ecology and organizational innovative ecology.

*Eco-Innovation and Sustainable Development in Industry 5.0*, in a nutshell, provides a multidisciplinary approach towards nurturing sustainability or sustainable production and consumption systems in Industry 5.0. This book provides the basis for integrating digital and human labor for workforce sustainability across various industries. The book is also essential for conventional and corporate universities looking forward to achieving sustainable development goals. It provides a guideline in designing and implementing green creativity and eco-innovation based on a wide range of global issues on social, environmental and workforce sustainability. The expertise provided in this scholarly work comes from all over the world. This compendium of chapters from various scholars across the globe provides a unique viewpoint that results from cultural and geographic differences, which is useful in contextualizing and nurturing sustainable development in Industry 5.0.

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