

INNOVATION
ECOSYSTEMS AND
SUSTAINABLE
TECHNOLOGIES

ENHANCING
COMPETITIVENESS AND
SUSTAINABILITY

EDITORS

RUBEE SINGH

VINCENZO CORVELLO

ILDA MARIA CONIGLIO

SHAHBAZ KHAN



Innovation Ecosystems and Sustainable Technologies

EMERALD STUDIES IN SUSTAINABLE INNOVATION MANAGEMENT

Series Editors: Vincenzo Corvello, University of Messina, Italy; Orlando Troisi, University of Salerno, Italy

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Innovation Ecosystems and Sustainable Technologies: Enhancing Competitiveness and Sustainability

EDITED BY

RUBEE SINGH

GLA University, India

VINCENZO CORVELLO

University of Messina, Italy

ILDA MARIA CONIGLIO

University of Rome Tor Vergata, Italy

AND

SHAHBAZ KHAN

University of Tabuk, Kingdom of Saudi Arabia



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About the Editors

Rubee Singh is an Assistant Professor of Human Resource (HR) at Institute of Business Management, GLA University, India. She is a post-doctoral (D. Lit) researcher at Kumaun University, Nainital, India. She holds a PhD in Management from Noida International University, India, and an MBA in HR from Dr A. P. J Abdul Kalam Technical University, India. She has published 20 academic books and more than 75+ research papers in SCI, ABDC-A, Scopus and UGC-index journals. Her areas of research are net zero, circular economy, digital circular economy (CE), sustainability, digital human resource management (HRM), sustainable HRM, Industry 4.0, Artificial Intelligence (AI) and corporate social responsibility (CSR). She has been honoured with many prestigious awards, which include consecutive Best Researcher Award of the Year – 2022–2023 and 2023–2024 by GLA University, Child Ambassador Award of The Year 2022, Iconic Faculty Award 2019, International Young Researchers Award – 2021 and Young Scientist Award 2020.

Vincenzo Corvello is an Associate Professor at Department of Engineering, University of Messina, Italy. He is a Research Associate (Research Fellow) at London School of Economics. He earned his PhD in Business and Economic Engineering, from Università degli Studi di Napoli Federico II, Italy, and did his master's degree in Management Engineering from Università della Calabria, Italy. He has contributed over 80+ research papers in internationally referred journals indexed in ABDC-A, ABDC-B, ABS, SCI, Scopus and refereed journal. He has an excellent research track record with over 3,500 citations on Google Scholar and H-index-26. He is an Editor-in-Chief of *European Journal of Innovation Management (EJIM)*, Emerald and Book Series Editor of 'Emerald Studies in Sustainable Innovation Management, Emerald'. His research interests are Organization Design, Innovation Process Management, Organization Analysis, Sustainable Innovation, Eco-innovation, Digital Innovation, Digital Business, Entrepreneurship, Sustainable Business Models, Strategy and Digital Transformation.

Ilda Maria Coniglio is a Visiting Faculty at Department of Enterprise, University of Rome Tor Vergata, Rome, Italy. Along with this, she is working as Project Manager and Innovation Manager at Conad-PAC2000A. Previously, she was a contract researcher at the Department of Mechanical, Energy and Management Engineering of the University of Calabria, where she taught in the master's degree in Management Engineering. Her research interests are in the fields of strategic

management, innovation management, sustainability, logistics and supply chain management. She has carried out scientific research in nationally funded projects on sustainable business models. Her studies have been published in international conferences and peer-reviewed journals such as *European Management Journal*, *Journal of Entrepreneurship Education and Management Decision*. She is an editorial board member of *European Journal of Innovation Management (EJIM)*, Emerald.

Shahbaz Khan is an Assistant Professor at the Department of Industrial Engineering, University of Tabuk, Kingdom of Saudi Arabia. He has published more than 80+ research articles in many reputed journals including Scopus, SCI, and ABDC-A categories such as Business Strategy and Environment, Annals of Operation Research, Operations Management Research. He has an excellent research track record with 4,000 citations on Google Scholar and H-index-35. He has obtained his PhD and MTech degree with specialization in Industrial and Production Engineering from Jamia Millia Islamia, India. He is a gold medalist in MTech. He is a member of the International Association of Engineers, Thailand. His research interests are supply chain management, digital supply chain management, circular economy and sustainability, net zero, Industry 4.0, blockchain, AI. He has published five books in few leading publishers such as Springer, Elsevier and DeGruyter.

List of Contributors

<i>Fahad Ziaul Ain Usmani</i>	SEE Institute, UAE
<i>A. Arun Kumar</i>	ICFAI Foundation for Higher Education, India
<i>Bhagya Arunodhi</i>	Wayamba University of Sri Lanka, Sri Lanka
<i>Raed Awashreh</i>	A'Sharqiyah University, Oman
<i>Apata Stella Bolanle</i>	Adekunle Ajasin University, Nigeria
<i>Mrinalini Choudhary</i>	Shenandoah University, USA
<i>Ilda Maria Coniglio</i>	University of Rome Tor Vergata, Italy
<i>Vincenzo Corvello</i>	University of Messina, Italy
<i>Narayanage Jayantha Dewasiri</i>	Sabaragamuwa University of Sri Lanka, Sri Lanka
<i>Hiranya Dissanayake</i>	Wayamba University of Sri Lanka, Sri Lanka
<i>Jacinta Dsilva</i>	SEE Institute, UAE
<i>Gurunadham Goli</i>	School of Business, SR University, Warangal, Telangana, India
<i>Mananage Shanika Hansini Rathnasiri</i>	Department of Marketing Management, Faculty of Management Studies, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka
<i>B. Hari Krishna</i>	Osmania University, India
<i>K. Hariharan</i>	ICFAI Foundation for Higher Education, India
<i>Almi Hassiba</i>	Badji Mokhtar - Annaba University, Algeria
<i>Anuradha Iddagoda</i>	University of Sri Jayewardenepura, Sri Lanka
<i>Syed Hasan Jafar</i>	Woxsen University, India

xii List of Contributors

<i>Vaibhav Jain</i>	Maharaja Agrasen Institute of Technology, India
<i>Jipson Joseph</i>	Christ University, India
<i>Amit Joshi</i>	Kumaun University, India
<i>Gopika Juneja</i>	Nirma University Ahmedabad, India
<i>Raghuveer Katragadda</i>	V.R. Siddhartha Engineering College, India
<i>Shahbaz Khan</i>	University of Tabuk, Kingdom of Saudi Arabia
<i>Sonal Khurana</i>	Vivekananda Institute of Professional Studies, India
<i>Kishore Kumar</i>	Bennett University, India
<i>Vikas Kumar</i>	Birmingham City University, UK
<i>Sumithra Nandana Kumara</i>	Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka
<i>M. Rajya Laxmi</i>	School of Business, SR University, Warangal, Telangana, India
<i>D. M. Arvind Mallik</i>	PESITM, India
<i>Bisma Mannan</i>	University of Plymouth, UK
<i>Archan Mitra</i>	Presidency University, India
<i>Deshika Nainanayake</i>	Western Sydney University, Australia
<i>Donkor Nawaah</i>	Woxsen University, India
<i>Oyenuga Michael Oyedele</i>	Woxsen University, India
<i>Ananya Pandey</i>	Christ University, India
<i>Pranav Saraswat</i>	Nirma University Ahmedabad, India
<i>Mohamed Irfan Shaikh</i>	SEE Institute, UAE
<i>Ankita Sharma</i>	Christ University, India
<i>Akshay Singh</i>	Indra Gandhi National Open University, India
<i>Rubee Singh</i>	GLA University, India
<i>Rachoru Himani Srihita</i>	School of Business, SR University, Warangal, Telangana, India
<i>Rakesh Suryadevara</i>	ICFAI Foundation for Higher Education, India

Preface

Technology is the key driver of an economy's development. Innovation ecosystems, including actors, their technologies and their business models, are essential for understanding the economic and social impacts of innovation. The book investigates the innovation ecosystem of the world in comparison to other innovation-driven countries. With the support of innovative technology-based approaches, it aims to create viable solutions for a sustainable future and a positive societal transformation that will ultimately lead to a positive outcome for all concerned. This book will strategically illuminate how the innovative, sustainable ecosystem can play an important role in building the country's innovation capability with the help of sustainable technologies by examining specific examples of how sustainability can play a part in bringing innovation efficiency to the country, along with mentioning specific pieces of evidence to support this claim.

In this age of rapid globalization, it is increasingly important to recognize the value of comprehending sustainability, technology and innovation ecosystem, which is emerging as the economic and social activities around the world expand. As an integral aspect of socio-economic progress, innovation ecosystems are comprised of key actors who contribute to the development of these ecosystems, which is a key component of fostering socio-economic growth. The book starts by providing an overview of the innovation ecosystem, its components and governance. A critical examination of the theories driving innovation, as well as the interplay among various factors such as governments, industries, academia and NGOs, is discussed in this book. A prominent feature of this book is the inclusion of theories that explain technology push and demand pull as the drivers of innovation as they contribute to strengthening the ecosystem of innovation and entrepreneurship. Throughout the book, emphasis is placed on how external knowledge networks and public policies can facilitate the development of more realistic, dynamic models of innovation.

During this era of innovation ecosystem and sustainability, living with emerging technologies has resulted in many benefits and advancements in several industries, but it has also resulted in a number of challenges and concerns for people, organizations and the environment. For emerging technologies to fully benefit society, it is essential for policies and regulations to develop from which industry can leverage the advantage of technology. There is a need to continually assess the impact of emerging technologies and make adjustments as required in order to ensure that the benefits of the technology outweigh any disadvantages

that may arise. There are a number of complex networks that go beyond markets to form innovation ecosystems. These networks are business networks that become ecosystems through collaboration. Creating collaborative networks creates ecosystems for innovation. The innovation process consists of not only a network of interactions between national and regional innovation systems but also a strategic interaction between them. Economic agents in an innovation ecosystem build networks of businesses, entrepreneurs, employers, employees, producers, consumers, government agencies, etc.

Economic growth and development cannot be achieved without innovation. Considering the nature of innovation, it is imperative to develop a comprehensive framework that is suited to complex economic relations. Globally, sustainable development outweighs exponential growth, which is generally viewed as a mechanical progression that does not cater to the needs of the future, primarily due to diminishing resources and finite land. Sustainable development is largely dependent on innovation, which is one of the most significant factors. Innovation ecosystems are created when a combination of external and internal factors interact in an economy to produce a system of interconnected economic factors. In addition, this book attempts to draw a close connection between innovation ecosystems and sustainable development in order to seek ways of improving economic, environmental and social well-being based on improvements to the innovation ecosystems. The external social and environmental factors should also be considered when optimizing internal innovation processes. It is no secret that emerging technologies and dynamic innovation ecosystems are critical to sustainable development. It is a quest for new ways of production that provide high standard of living for all sections of society not only on a short-run but also on a long-run basis.

It is possible that the book will discuss the role that policy frameworks, financing mechanisms and international collaboration will play in facilitating the adoption of emerging technologies in the innovation ecosystem toward sustainability on a global scale. There is a need for adoption of sustainable technologies with the advancement of innovation ecosystems in the era of sustainability according to the Sustainable Development Goals by the United Nations, which is the reasoning behind the significance of the book. It is crucial in combating the issue and challenges related to emerging technologies for a sustainable future by providing a comprehensive analysis of potential emerging technological solutions for innovation that can help the entire world achieve that sustainability. This book is positioned to be a very timely resource because it focuses on transitioning to an innovation ecosystem, sustainability and emerging technologies in an increasingly globalized world, making it perfect for policymakers, researchers and company leaders alike.

This book will be a great resource for readers to learn how emerging technologies such as AI, Internet of Things (IoT) and cloud technologies are transforming innovation ecosystems and promoting sustainability. This book will teach readers how to navigate innovation ecosystems in the era of sustainability, as well as sustainable innovation recommendations to adopt sustainable technologies. It will provide readers with information about emerging technologies

which are driving sustainable innovation ecosystems. Ideally, the book will be structured in a comprehensive manner, covering various aspects of Industry 4.0-based emerging technologies such as AI, Internet of Things, cloud technologies and their potential impact on a digital and sustainable innovation ecosystem toward sustainability. In order to transform the innovation ecosystem in the era of sustainability, it is likely to include chapters dedicated to sustainable IoT, green technology innovation, cloud technologies, and innovative solutions for building a sustainable invention ecosystem.

The book has been divided in three parts in which there are total 15 chapters from different countries such as India, Sri Lanka, United Kingdom, Dubai, Italy, Nigeria, Oman, Algeria and Australia. This book is the result of a collective effort by scholars and experts from various fields, bringing together diverse perspectives and in-depth research. We extend our heartfelt gratitude to all contributors and reviewers whose efforts have made this publication possible. Special thanks go to Emerald Publishing for their support and dedication to advancing scholarly work in innovation ecosystem and sustainability for emerging technologies. In conclusion, ‘Innovation Ecosystem and Sustainable Technologies: Enhancing Competitiveness and Sustainability’ aims to inspire and equip readers with the knowledge and tools necessary to drive sustainable world and environmental stewardship. It is our hope that this book serves as a valuable resource, guiding the global community toward a sustainable future and fostering a sustainable and resilient industrial innovation ecosystem.

(Book Editors)

Rubee Singh

Vincenzo Corvello

Ilda Maria Coniglio

Shahbaz Khan

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Finally, we would like to acknowledge the invaluable contributions of our colleagues and editors, who have worked tirelessly to ensure that this book is informative, engaging and accessible to a wide range of readers. We hope that this book will inspire further research and action toward an innovation ecosystem and technologies to promote sustainability as per United Nations agenda.

We would like to express our sincere gratitude to the experts and stakeholders who contributed their valuable insights and perspectives to this book. Their contributions have been instrumental in shaping our understanding of the challenges and opportunities involved in achieving sustainability with the use of emerging technologies and innovation ecosystem at globally. We hope that this book will serve as a useful resource for policymakers, practitioners and researchers working toward an innovation ecosystem and emerging technologies for sustainable future for the continent.

We are immensely thankful to *Book Series-Editors, Prof Vincenzo Corvello, Prof Orlando Troisi* and the entire team at *Emerald Publishing* for bringing out this publication in a very professional and timely manner.

(Book Editors)
Rube Singh
Vincenzo Corvello
Ilda Maria Coniglio
Shahbaz Khan

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Part I

Innovation Ecosystem for Sustainability

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Chapter 1

Fostering Sustainable Innovation Ecosystems Through Organizational Commitment

D. M. Arvind Mallik^a, Rubee Singh^b, Shahbaz Khan^c and Ilda Maria Coniglio^d

^aPESITM, India

^bGLA University, India

^cUniversity of Tabuk, Kingdom of Saudi Arabia

^dUniversity of Rome Tor Vergata, Italy

Abstract

Purpose: As global challenges like environmental degradation and social inequality grow, businesses are urged to adopt innovative sustainability practices. These practices address critical issues while boosting competitive advantage and organizational commitment. This study explores how innovative sustainability practices impact organizational commitment and foster a culture of sustainability while addressing global challenges enhancing competitive advantage and engagement.

Design/Methodology/Approach: The research study is based on an extensive literature review that explores various aspects of implementing innovative sustainability practices. It evaluates their impact on organizational commitment and examines the factors that influence this commitment.

Findings: The study finds that integrating innovative sustainability practices significantly boosts organizational commitment. A new conceptual framework aligns with progressive values and addresses challenges in sustainability, enhancing commitment through empirical measures. The inferences highlight key factors that amplify this effect, offering actionable insights for optimizing sustainability efforts.

Research Limitations/Implications: The findings offer valuable guidance, showing that innovative sustainability practices can boost organizational

commitment and provide environmental and social benefits. However, the study's limitations include reliance on outdated literature and a lack of real-world data, which may affect its applicability across different industries, and regions.

Originality/Value: This research provides new insights into how advanced sustainability practices can transform organizational commitment, contributing to the broader discussion on sustainability and innovation.

Keywords: Innovative sustainability practices; organizational commitment; business sustainability; ethical sourcing; stakeholder engagement. environmental impact; organizational culture; corporate social responsibility (CSR)

1.1 Introduction

In today's fast-changing global market, businesses face increasing pressure to tackle environmental, social, and economic challenges. Sustainability has evolved from a compliance-driven effort to a strategic priority that enhances competitiveness and core values. Mura et al. (2024) argue that adopting sustainable practices positions companies as leaders, promoting long-term success. One such approach is the circular economy (CE), as Pla-Julián and Guevara (2019) highlight, which generates value while benefiting both society and the environment. As more organizations embrace sustainability, their dedication to these efforts grows. However, Jesus and Jugend (2023) note that while open innovation (OI) can reduce barriers to adopting the CE, there is still limited understanding of how OI can integrate with CE to create a more sustainable economy. Additionally, Hussain et al. (2018) suggest that organizational capital plays a dual role in supporting or hindering sustainable initiatives, making it a critical element for success. Supporting this, Ringvold et al. (2023) show that transparent sustainability reporting enhances employee commitment, aligning corporate actions with workforce values. Furthermore, sustainability practices can lead to favorable spillover effects, increasing employee dedication and fostering a more engaged workforce.

As global issues like environmental degradation and social inequality worsen, businesses are increasingly adopting innovative sustainability practices to gain a strategic edge (MacGregor et al., 2017). This study explores how these practices influence organizational commitment, focusing on factors that mediate or moderate the link between sustainability efforts and business outcomes. Organizational commitment, which aligns stakeholders and employees with company values, is key to successful sustainability strategies. Zhao et al. (2023) note that human resource practices are evolving at different rates across businesses to address growing external pressures. Sharma (2018) highlights the role of ethical leadership in promoting transparency and moral decision-making, which shapes stakeholder and employee behavior. Similarly, Alshura et al. (2023) stress the importance of leadership in fostering a sustainability-driven workplace culture that supports long-term success.

1.1.1 Meaning – Sustainability

Sustainability has emerged as a key concept in recent years due to growing concerns over environmental degradation, social equity, and economic stability. This literature review explores various scholars' interpretations of sustainability, highlighting its multidimensional nature.

- [Brundtland and Khalid \(1987\)](#) – In *Our Common Future*, the Brundtland Commission defines “sustainability as development that meets current needs without compromising future generations’ ability to meet their own”.
- [Elkington and Rowlands \(1999\)](#) – “The concept of the ‘triple bottom line’ emphasizes sustainability as the simultaneous pursuit of economic prosperity, environmental integrity, and social equity.”
- [Daly \(1990\)](#) – Daly defines sustainability as “creating a steady-state economy that prioritizes ecological, cultural, and economic sustainability, ensuring that basic needs are met for all, rather than fulfilling unlimited desires for a select few.”
- [Bartlett \(2012\)](#) – Bartlett argues that the “growth of both population and resource consumption rates is unsustainable, encapsulated in his ‘First Law of Sustainability.’”
- United Nations [Agenda for Development \(1997\)](#) – The UN defines “development as a multidimensional effort to improve the quality of life for all, recognizing economic, social, and environmental dimensions as interdependent and mutually reinforcing aspects of sustainable development.”

1.1.2 Organization and Sustainability

In today’s global landscape, sustainability has become a top priority across industries ([Kerdpitak & Boonrattanakitthummi, 2020](#)). Organizations are reassessing their practices to better protect the environment, embrace social responsibility, and ensure economic resilience, which, in turn, influences employees’ emotional connection to their workplaces ([Olafsen et al., 2021](#)). Besides, [Meyer and Allen \(1991\)](#) categorizes organizational commitment into three types – affective, continuance, and normative – each playing a role in shaping how employees engage with sustainability initiatives. [Adu and Nawangsari \(2022\)](#) emphasize sustainability as a proactive strategy, focusing on reducing carbon emissions, adopting ethical supply chains, and fostering community engagement. As [Jorna \(2017\)](#) points out, businesses are now integrating sustainability into their core operations to achieve balanced and sustainable progress, highlighting its critical role in long-term success.

1.1.3 Sustainability and Organizational Empowerment

Organizational empowerment is essential for addressing business challenges, fostering innovation, and promoting sustainable growth. By encouraging employees

to adopt sustainability values, companies improve their ability to address modern issues and support a sustainable future (Benkarim & Imbeau, 2021). This empowerment not only strengthens organizational commitment but also boosts employee loyalty. Transparent sustainability reporting plays a key role in engaging stakeholders, as Boiral (2012) notes, aligning sustainability efforts with employee values to enhance both commitment and ethics. Empowered employees are pivotal in improving environmental performance and driving organizational growth (Dwivedi et al., 2023). Hart (2005) emphasizes the importance of transformational leadership in encouraging active participation in sustainability initiatives, Cantele and Zardini (2018) further connect sustainability practices to gaining a competitive edge, and Al Doghan et al. (2022) show that sustainability policies foster long-term commitment and contribute to organizational success while Porter and Kramer (2002) highlight the benefits of involving employees in environmental decision-making.

1.1.4 Historical Development of Sustainability Practices

Understanding the evolution of sustainability practices is essential for comprehending their current impact (Caradonna, 2017). Significant changes across sectors have marked this evolution (Garren & Brinkmann, 2018). Historical reviews have highlighted key milestones and factors that have shaped these practices (Elkington & Rowlands, 1999). Bansal (2005) describes this progression from legal compliance to proactive integration, which has influenced legislation and agendas. This shift from reactive compliance to strategic incorporation is evident (Christofi et al., 2012). Today, sustainability encompasses environmental, social, and governance aspects and is integral to long-term business success (Bergquist, 2017), with practices increasingly woven into corporate strategy and stakeholder engagement.

1.1.4 Sustainability Practices

Sustainability practices are now central to organizational success (Nakata & Viswanathan, 2012). Companies are integrating these principles to address environmental, social, and economic challenges, which require strong commitment from employees and stakeholders. This underscores the significance of organizational culture on adopting sustainable policies. Schaltegger et al. (2016) review core sustainability concepts, and Martinez-Martinez et al. (2019) discuss integrating sustainable practices in supply chains.

1.1.5 Innovation Ecosystems

Concerns over climate change, resource depletion, and social inequality have intensified the focus on sustainability in corporate practices, leading to innovative approaches (Holbeche, 2015). Innovation ecosystems (IEs) are key to creating

shared value and benefiting communities though their exploration remains fragmented (Klewitz & Hansen, 2014; Piantoni et al., 2023). Social enterprises are crucial for job creation, innovation, and sustainability (Abdul-Rahaman et al., 2023). Companies are integrating sustainable strategies to tackle environmental, social, and economic challenges, with organizational culture, resources, knowledge, and technology playing essential roles in enhancing performance (Carayannis et al., 2015; Seebode et al., 2012; Tang & Ali, 2024). Social entrepreneurs contribute to shared value in IEs and guide policymakers on fostering these ecosystems (Pirson, 2012).

1.2 Research Methodology

1.2.1 Overview of the Study Design

Researchers through this paper aims to address existing gaps in understanding the role of innovation in sustainable in fostering virtuous innovation dynamics within sustainability and its implications for business practices and been guided by solving three research questions:

- RQ₁*. What focus areas impact innovation in sustainability practices for businesses?
- RQ₂*. What role does innovation play in the overview of sustainability study design and objectives?
- RQ₃*. What major and minor challenges are encountered, and how can a framework be created for empirical sustainability measurement?

Researchers have developed a conceptual framework (see Fig. 1.1) to explore the link between innovation, sustainability, and corporate practices. This framework utilizes secondary data from literature, scholarly publications, books, and reports. By analyzing case studies, the study identifies key factors, opportunities, and challenges, proposing methods to integrate sustainability effectively across businesses.

1.2.2 Focus Areas for Bringing Sustainable Innovation for Business

Businesses that want to balance growth with social and environmental responsibility must innovate in their sustainability procedures. Innovative sustainability strategies become essential as firms tackle issues such as resource depletion, social injustices, and climate change (Geissdoerfer et al., 2018). These methods improve long-term resilience, foster competitive advantage, and uphold environmental stewardship (Aagaard, 2019). This introduction looks at how companies are using innovative sustainability methods to deal with today's issues and build a sustainable future.

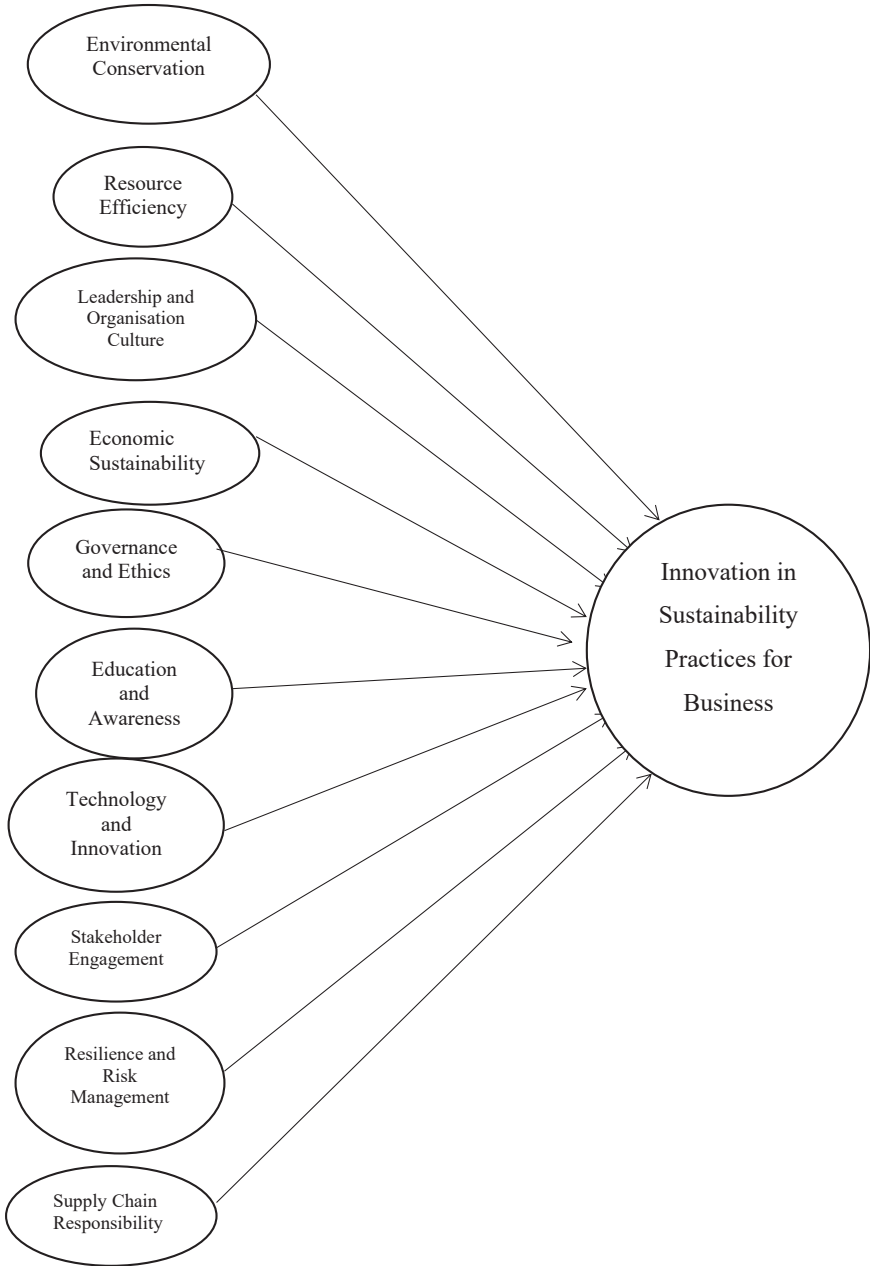


Fig. 1.1. Transforming Sustainability Through Innovation: The Author's Conceptual Framework for Business Practices.