

# SCIENCE AND TECHNOLOGY FOR SUSTAINABLE FUTURE



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# **SCIENCE AND TECHNOLOGY FOR SUSTAINABLE FUTURE**



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## PREFACE

It is with immense satisfaction and pride, I present this edited volume, which brings together a diverse collection of research contributions aimed at advancing Science and Technology for Sustainable Development. The chapters in this book exemplify the interdisciplinary spirit and innovative thinking essential for addressing the challenges of sustainability in the modern era.

This book is organized into twenty-six chapters in five sections - Physical Sciences, Mathematical Sciences, Life Sciences, Health Sciences, and Humanities - each offering unique perspectives on critical aspects of science and technology in the context of sustainability. The topics span a wide array of subjects, from groundbreaking material innovations and computational studies to ecological conservation, genetic diversity, and bibliometric analyses. This multidisciplinary approach highlights the interconnectedness of scientific endeavours and their significance in solving global challenges.

In addition to providing insights into cutting-edge research, this volume underscores the importance of regional studies, such as the exploration of genetic diversity in rice beans and ecological assessments in Northeast India. These contributions emphasize the dual role of science in driving technological progress while fostering environmental and societal well-being.

I extend my heartfelt gratitude to all the contributors, reviewers, and the editorial team for their dedication and collaborative effort in making this book a reality. I hope that the knowledge and ideas presented in these chapters will serve as a source of inspiration, sparking further exploration, innovation, and collaboration in the pursuit of sustainable development.

*Dr. R. N. Sinha*

## **EDITORIAL**

The scientific community continues to prioritize sustainable science and technology as key drivers for shaping a healthier and more resilient future for global society. In response to the pressing challenges of the modern era, this edited volume, titled “Science and Technology for Sustainable Future,” presents a carefully curated collection of the latest research and advancements in this vital field.

The book embraces an interdisciplinary approach, highlighting the interconnectedness of diverse fields. It spans a wide range of topics, including physical sciences, biological sciences, mathematical sciences, health sciences, social sciences, and humanities. Notably, the inclusion of library and information science emphasizes the pivotal role of knowledge management in fostering sustainable practices and solutions.

As editors of this book, we have sought to bring together findings, reports, and insights that serve as a comprehensive guide for those exploring sustainability-focused science and technology. This volume reflects the depth and breadth of contemporary advancements, offering valuable perspectives for researchers and practitioners alike.

This compilation of 26 research articles showcases the innovative ideas and groundbreaking contributions of authors from across the country. Each chapter enriches ongoing scientific discourse and proposes meaningful pathways toward achieving a sustainable and equitable future.

Section I: Physical Sciences delves into advancements in materials science, environmental technologies, and computational investigations. Highlights include the modelling of steam power plants coupled with water-LiBr absorption refrigeration systems for energy efficiency and cooling, the use of X-ray absorption spectroscopy to evaluate interstellar medium composition, and the synthesis of lanthanum-doped  $\text{BiFeO}_3\text{-BaTiO}_3$  for dielectric and leakage property enhancement. Additionally, the section explores the nutritional value of small indigenous food fish, computational studies on Aminobutyric Acids interactions with  $\text{Mg}^{2+}$ , and innovative methods for phenol removal from wastewater using crushed brick powder.

Section II: This section focuses on theoretical and applied mathematical frameworks. Highlights include the study of neutrosophic i-open sets, metric spaces, and graph-theoretic approaches in modular metric spaces, demonstrating their utility in solving complex problems.

Section III: Life Sciences explores the biological and ecological dimensions of sustainability. It features studies on genetic diversity in rice beans, vegetable

cultivation in West Bengal, and the biochemical properties of indigenous medicinal plants. Notable contributions include an investigation into the larvicidal efficacy of ornamental fishes, a checklist of amphibian fauna in Chakrashila Wildlife Sanctuary, and an analysis of the length-weight relationship of freshwater fishes. This section underscores the intersection of biodiversity conservation, sustainable agricultural practices, and ecological health.

Section IV: This section bridges health and sustainability, featuring studies on physiotherapy's role in well-being and a detailed analysis of shoulder rotation in junior badminton players, offering insights into sustainable health practices.

Section V: Humanities underscores the importance of knowledge management and bibliometric analyses. These chapters explore research trends, scholarly outputs, and simplified approaches for managing bibliographic data, emphasizing the evolving landscape of academic research.

We, the editors, express our deepest gratitude to all the contributors for their unwavering commitment to advancing science and technology in the service of global sustainability. We believe this volume will inspire researchers, educators, policymakers, and engaged citizens to embrace the transformative potential of science and technology in building a sustainable future.

*Editors*

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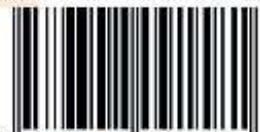
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