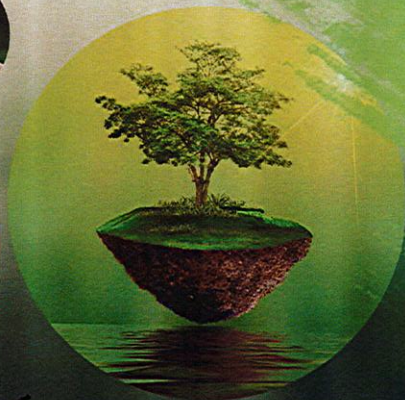


SUSTAINABILITY AND BEYOND

A VISION FOR THE FUTURE



Cinnie Susan Antony
Ambili T R



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LORE & ED
KOTTAYAM, KERALA - 686560



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Sustainability and Beyond: A Vision for the Future

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PREFACE

As we navigate the complexities of the modern world, it becomes increasingly clear that our relationship with the environment is at a critical juncture. Climate change, pollution, and biodiversity loss threatens not only the health of our planet but also our very way of life. Amidst these challenges lies an opportunity for transformation and renewal. This book, "Sustainability and Beyond: A vision for the future" is a call to action, a reminder that the pursuit of a sustainable environment is not just a moral imperative but a practical necessity. It is an effort to bring together like minded people from various fields to explore the complex relationships between human activity, environmental degradation, and sustainable development. Through a combination of researchwork, case studies, and practical solutions, this book aims to inspire and empower readers to take action towards creating a more sustainable future. From innovative technologies to policy initiatives, this book explore the ways in which individuals, communities, and governments can work together to protect the planet and ensure a livable future for generations to come. As we stand at the crossroads of environmental sustainability and human well-being, this book offers a timely and thought-

provoking exploration of the challenges and opportunities that lie ahead. We hope that it will serve as a valuable resource for anyone interested in contributing to a more sustainable and equitable world.

On the completion of this book we extend our heartfelt gratitude to the Department of Biotechnology (DBT) for the financial support for publishing this book. We also extend our sincere thanks to our Principal Prof. (Dr.) Sr. Minimol Mathew for the constant encouragement and support which has been instrumental in shaping this book. Our sincere thanks to our College Bursar Rev. Fr. Kuriakose Vellacahlil for the motivation and generous support which has helped us in bringing the dream of publishing this book to fruition. Special thanks to our Vice Principals for the guidance and support which has been invaluable to us throughout this endeavour. We also extend our sincere thanks to all the authors for their precious contribution to this book. Above all we bow down before God Almighty for making our dream come true.

Editors

FOREWORD

It is with great pleasure and a deep sense of academic fulfillment that I write this foreword to the book *Sustainability and Beyond: A Vision for the Future*, an edited volume emerging from the National Seminar on Environmental Sustainability for a Better Future, organized by the Postgraduate and Research Department of Zoology, Alphonsa College, Pala, under the auspices of the DBT-STAR College Scheme. The seminar, held on 7-8 October 2025, is a milestone in the continuing journey of Alphonsa College towards promoting meaningful scholarship, fostering critical dialogue, and nurturing the values of ecological stewardship.

Environmental sustainability is not merely an academic subject; it is the very essence of human survival and planetary well-being. The challenges of climate change, biodiversity loss, pollution, and unsustainable resource exploitation confront us with unprecedented urgency. At the same time, remarkable scientific and technological advancements open new doors for innovation, conservation, and restoration. It is in this crucial context that this collection of chapters takes on relevance, as it captures the

diverse perspectives, findings, and insights of scholars who are committed to addressing environmental issues with scientific rigor, social responsibility, and visionary thinking.

The volume encompasses an impressive range of topics, reflecting the interdisciplinary nature of sustainability studies. From the isolation and characterization of bacteria from the caterpillar *Papilio polytes* to insights into toxicological effects of calcium carbonate on earthworms, the chapters remind us of the delicate balance that sustains life at the micro and macro levels. The contributions on environmental nanotechnology, AI-driven monitoring, and circular economy models highlight the power of modern tools and approaches in shaping greener futures. Equally important are the papers that draw attention to forest policies, bio-indicators of pollution, biological invasions, and riverine ecosystem dynamics, each shedding light on pressing ecological questions with significant policy and conservation implications.

The inclusion of chapters on Ayurvedic medicinal plants, traditional formulations, and immune modulating flora further emphasizes the relevance of indigenous knowledge systems and their integration with modern science. Such explorations remind us that sustainability is not only about technological solutions but also about cultural wisdom, health, and human well-being. The section on knowledge management for biodiversity conservation

and microbial bioremediation consortia extends this thought, proposing systemic and collaborative strategies for environmental protection.

What makes this volume unique is its synergy of young researchers and seasoned academicians, reflecting the vibrant academic culture of Alphonsa College. Each contribution, whether experimental, theoretical, or review-based, represents an earnest effort to explore environmental challenges from different vantage points. Together, they weave a rich tapestry of inquiry that speaks to students, researchers, policy makers, and all those concerned about our ecological future.

I must place on record the remarkable role of the Department of Zoology, Alphonsa College, in fostering such an intellectual platform and very specially Dr. Ambili T.R and Dr. Cinnie Susan Antony for the backbone of this books as editors. The department has long stood as a beacon of academic excellence, research, and social commitment. By securing support under the DBT-STAR College Scheme, the department has ensured that its students and faculty are exposed to cutting-edge scientific ideas while being grounded in values of care for nature and society. This book is another testimony to that commitment.

The academic rigor reflected in the guidelines for paper submission and the careful editorial process ensure

that this volume goes beyond being a mere compilation of seminar papers. It stands as a scholarly resource, carrying ISBN accreditation, and will serve as a valuable reference for further research in environmental science and sustainability studies.

I extend my heartfelt congratulations to the Principal, Faculty members and contributors for their thoughtful work, to the convenors and coordinators for their meticulous planning, and to the editorial team for curating this significant volume. May this book inspire readers to engage more deeply with the challenges of sustainability, to contribute meaningfully to conservation, and to reimagine a future where human aspirations and ecological balance coexist harmoniously.

As the title aptly suggests—*Sustainability and Beyond: A Vision for the Future*—the pursuit of sustainability must not end with remedial actions or policy formulations. It must transcend into a vision, a way of life, and a moral compass that guides humanity in the 21st century and beyond. I trust that this book will play its part in kindling such a vision in the minds of its readers. Best wishes.....

Prof. (Dr.) T.C. Thankachan

Principal,

St. Thomas College of Teacher Education, Pala

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"Earth provides enough to satisfy every man's needs, but not every man's greed."

– Mahatma Gandhi

"One of the first conditions of happiness is that the link between man and nature shall not be broken."

– Leo Tolstoy

"We do not inherit the earth from our ancestors; we borrow it from our children."

– Native American Proverb



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