

Vikas Shrivastava, Sandeep Panchal, Ankit Kumar *Editors*

Sustainable Civil Engineering

Selected Papers from Sustainable and Holistic Approach
Towards Supply and Waste Management of Water and
Infrastructure 2025



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Preface

In 21st century, the engineering practices are aligned towards the concept of sustainability. The alternative materials, sustainable structural designs, sustainable resource optimization during the design of civil engineering structures are in high demand. The aim of this book is to bridge the gap between civil engineering practices and need of sustainability. The book consists of the different case studies and designing studies using the different advanced software and soft computing tools.

The book is a collection of selected research paper from the National Conference on *Sustainable and Holistic Approach Towards Supply and Waste Management of Water and Infrastructure, 2025* organized by **Swadeshi Science Movement of India, Delhi in collaboration with Indian Water Works Association, Prayagraj and Motilal Nehru National Institute of Technology Allahabad**. The conference received around sixty submissions on the different topics out of which six submission on the sustainable structural engineering are selected for publication in this book.

No single book can cover the vast scope of sustainable civil engineering, and this volume is no exception. However, it is our sincere hope that it will spark critical thinking, encourage collaboration across disciplines, and serve as a stepping stone toward a more sustainable built environment.

We extend our deepest gratitude to the participants, authors, reviewers and editorial board members whose questions and challenges have continually expanded our perspective on what sustainability can mean for structural engineering.

Vikas Shrivastava
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About Editors



Dr. Vikas Shrivastava is currently working as Professor in Department of Civil Engineering at Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS). He is acting president of Swadeshi Science Movement of India. He has published more than 100 research papers and attended numerous National and International Conferences. He is life member of many societies including Swadeshi Science Movement of India, Indian Society for Technical Education, and Indian Concrete Institute.



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Contents

1	Study of Seismic Response of Building with Fixed Base and Base isolation for Infrastructure Sustainability.....	1
	Rahul, Yogesh Aggarwal	
2	Performance Analysis and Cost Optimization of Extradosed Bridges.....	18
	Gourav Sandhu, Paratibha Aggarwal	
3	Comparison of Linear Analysis for RCC Structure Using ETABS.....	36
	Anurag Yadav, Ashok Aggarwal	
4	Effective Utilization of Waste materials in Self compacting concrete for Sustainable Development- A Review.....	52
	Shubham Dhiman, Parathiba Aggarwal, Ankit Kumar	
5	Sustainable Concrete with GGBS, Marble Dust, Silica Fume, and Recycled Concrete Aggregate: A Study on Mechanical and Durability Properties.....	85
	Anshul Saini, Parathiba Aggarwal	
6	Nanomaterial Application in Geopolymer Concrete-A Review.....	92
	Parah Salsabeel Jalal, Vikas Srivastava	
7	Water Management Technologies and Smart Cities: A Route to Sustainable Urban Development.....	112
	Parah Salsabeel Jalal, Vikas Srivastava	
8	Impacts of Climate Change on Hydro- Meteorological Resources in the Pancheshwar Basin: A SWAT-Based Approach.....	122
	Hardeep Kumar Maurya, Shakti Suryavanshi, Vijeta Singh	
9	Fenton Oxidation Processes For The Treatment Of Shampoo Greywater.....	135
	Kapil Purwar, Basavaraju Manu	
10	A Review on Innovative Water Conservation Methods with context to India.....	143
	Harshit Saxena, Vikas Srivastava	

डा. डी पी भट्ट

अध्यक्ष, विज्ञान भारती दिल्ली

संस्थापक अध्यक्ष, महाकर्म फाउंडेशन
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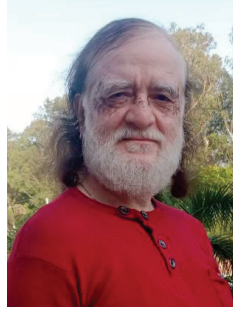
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FOREWORD

It is a matter of great pride that the Swadeshi Science Movement of India – also called Vigyan Bharti, Delhi (A multifarious nationalistic Science forum in the National capital & originally founded by Professor K.I. Vasu & his associates from IISc Bengaluru) is publishing a E-Book with Deep Science Publishing for the National Conference on Sustainable and Holistic Approach Towards Supply and Waste Management of Water and Infrastructure held in Prayagraj on the pious occasion of MAHAKUMBH FESTIVAL 2025. I have great appreciation for the Swadeshi Science Movement "India Team" which is spearheading the task of the popularization of ancient Science, Engineering,



Technology and amalgamating it with the socio-spiritual aspects using Hindi & regional languages for the common man. I am further glad to notice that the present Conference has aimed to connect a vast reservoir of innovations by the invisible informal sector & formal sectors both dealing with the critical issues surrounding water supply, wastewater management and infrastructure sustainability towards a focus on innovative solutions, technologies and best practices that ensure efficient water use, minimize waste & support the development of resilient infrastructure systems. I am confident that the deliberations of the conference 2025 in the form of this Book, would go a long way in spawning new ideas & concepts in the chosen topics to provide the much needed fillip to the rapid advancement of Indian Education and Science for the society towards identifying many indigenous Holistic Technologies

I congratulate the organizers of the Vigyan Bharti, Motilal Nehru National Institute of Technology, Indian Water Works Association, particularly Prof. Vikas Srivastava and the experts, educationists, researchers, industry professionals, policymakers and other stakeholders of the Conference for their active involvement in bringing out this publication.

D. P. Bhatt

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