



PROVIDENCE
COLLEGE OF ENGINEERING
&
SCHOOL OF BUSINESS

RESILIENCE
360 INTERNATIONAL
CONFERENCE ON
SUSTAINABILITY



RESILIENCE 360

INTERNATIONAL CONFERENCE ON
SUSTAINABILITY

📅 17TH - 19TH MAY 2023



ORGANIZED BY



IN ASSOCIATION WITH



CO-SPONSORED BY



Resilience 360

Proceedings of DST- SERB and IEI (Pvt Ltd) sponsored
International Conference
on
Sustainability, RESILIENCE 360

First Volume

Editor

Dr. Sainu Franco



Title of the Book: Resilience 360 Proceedings of DST- SERB and IEI (Pvt Ltd) sponsored International Conference on Sustainability, RESILIENCE 360

First Volume- 2023

Copyright 2023 © Authors & Editor

Editor

Dr. Sainu Franco, Associate Professor and Head of Department Civil Engineering, Providence College of Engineering, Chengannur.

No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system, without permission in writing from the copyright owners.

Disclaimer

The authors and editor are equally responsible for the contents published in this book. The publisher doesn't take any responsibility for the same in any manner. Errors, if any, are purely unintentional and readers are requested to communicate such errors to the editors or publishers to avoid discrepancies in future.

E- ISBN: 978-1-68576-443-2

MRP Rs.250/-

Publisher, Printed at & Distribution by:

Selfpage Developers Pvt Ltd.,
Pushpagiri Complex,
Beside SBI Housing Board,
K.M. Road Chikamagaluru, Karnataka.
Tel.: +91-8861518868
E-mail:publish@iiponline.org

IMPRINT: IIP Iterative International Publishers

For Sales Enquiries:

Contact: +91- 8861511583
E-mail: sales@iiponline.org

Foreword

International Conference on Sustainability

Title: RESILIENCE 360

Sustainability has become quite a buzzword. Even though it is currently being used in business slogans, political platforms, product commercials, etc., when it comes to the environment, the focus is on sustainably utilizing our available resources in a way that avoids depleting them for future generations. Yet, it's important not to lose sight of alternate conservation efforts and concepts that can help protect the environment. Resilience is not akin to sustainability, nor is it a substitute. The two concepts complement each other well, and the implementation of resilience will only continue to aid the environment. When bouncing back from failure has become our state of actuality, resilience is indeed the future. This conference intended to bring together the various facets of Science, and approach the issues of sustainability in a holistic manner. Our endeavour was to convene a diverse set of stakeholders to understand and deliberate on the opportunities and challenges of integrating sustainability in industrial and business practices and also making suitable life-style changes.

The primary objectives of Resilience-360 included:

- Reiterating the need to conserve resources
- Exploring and identifying, ideas and methods to preserve nature and life
- Forging a collaboration of researchers from various fields, with an aim to ensure sustainable growth and development
- Assisting the new researchers to identify their area of research
- Enabling faculty participants to identify the plethora of fields where sustainability can be gainfully applied
- Encouraging young researchers to present their findings before the experts in the field.

Sustainable development proposed and promoted by the United Nations calls for a concerted effort towards building a resilient future for the planet and it's people, which is both inclusive and sustainable. This conference is the first in a series to approach the issue of Sustainability from a 360 degree perspective. It is a multi- pronged approach to resolve this very important issue that mankind is facing. Keeping in mind the very sustenance of human race, the basic needs of mankind, such as food, water, climate, materials, fuel etc are to be ensured for the future generations. Experts from multiple fields were invited to share their expertise. Diverse fields such as Ground water, Food Technology, Geology, Anthropology, Chemistry, Alternate Fuels, Artificial Intelligence, GIS, Remediation etc have all been included. The Keynote address as well as invited talks were all tailored to address the issue of sustainability.

Dr. Sainu Franco
Convenor

**Proceedings of DST- SERB and IEI (Pvt Ltd) sponsored
International Conference on Sustainability,
RESILIENCE 360
17-05-2023 to 19-5-2023**

Publication Team

Dr. Santhosh Simon, Principal, Providence College of Engineering, Chengannur.

Dr. Sainu Franco, HoD, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Jain Suzan Zachariah, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Editorial Team

Dr Santosh Murlidhar Pingale, Scientist-D, National Institute of Hydrology, Roorkee, Uttarakhand, India.

Dr. Venkata Ravibabu Mandla, Associate Professor & Head, Centre for Information and Communication Technology, National Institute of Rural Development, Hyderabad.

Dr. V John Kurian, Dean, Academic Research, Providence College of Engineering, Chengannur.

Dr. M C Philipose, Dean, Academics, Providence College of Engineering, Chengannur.

Dr. Sainu Franco, HoD, Civil Engineering, Providence College of Engineering, Chengannur.

Dr. Balagopal V, Dy.HoD, Civil Engineering, Providence College of Engineering, Chengannur.

Dr. Pramod Mathew Jacob, Dy Dean (Academics), Providence College of Engineering, Chengannur.

Conference Convenor

Dr. Sainu Franco, HoD, Civil Engineering, Providence College of Engineering, Chengannur.

Conference Coordinators:

Asst. Prof. Jain Suzan Zachariah, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Nibin Varghese, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Reshma Rajendran Beena, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Manjusha Manoj, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Harisankar K C, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Asst. Prof. Praveen M V, Assistant Professor, Civil Engineering, Providence College of Engineering, Chengannur.

Published By

Department of Civil Engineering, Providence College of Engineering

Preface

RESILIENCE 360 is an interdisciplinary journal on Sustainability, exploring and bringing together the various facets of Science and Engineering in order to approach the issues of sustainability in a holistic manner.

As human population grows, resources become finite, and our ecological footprint deepens, making it imperative to develop sustainable solutions. The journal aims to unearth innovative approaches, pioneering research, and transformative ideas unified by the goal of promoting sustainability. The symbiotic relationship between the main themes of the international conference on sustainability, exemplifies the delicate balance between human prosperity and ecological well-being. By engaging with diverse disciplines, RESILIENCE 360 aims to empower readers to be change agents in their respective domains. Each article has been carefully curated and reviewed, presenting a unique piece of the puzzle, enriching our understanding of how to preserve and nourish our planet for generations to come.

Acknowledgement

The realization of RESILIENCE 360, journal on sustainability has been a collaborative endeavour, and we are deeply grateful to the Principal and Management of Providence College of Engineering, whose contributions and support have made this publication possible.

The financial assistance provided by Science and Engineering Research Board (Department of Science and Technology, Government of India) played a crucial role in organizing the International Conference on Sustainability and also the publication of the conference proceedings as a journal. Their commitment to promoting scientific research and fostering innovation in diverse fields of sustainability has been instrumental in the realization of this publication.

We also express our sincere appreciation to the Institution of Engineers, India (IEI) for their collaboration and endorsement of RESILIENCE 360. The support from IEI has not only lent credibility to this endeavour but also reinforced the importance of disseminating knowledge and advancements in engineering and related domains.

We extend our heartfelt gratitude to the authors and researchers who have dedicated their time, knowledge, and expertise to produce insightful and innovative contributions for this journal. Your commitment to advancing the understanding and practice of sustainability in the various realms of sustainability is truly commendable.

We would like to express our sincere gratitude to the reviewers who diligently evaluated the submitted manuscripts, providing valuable feedback and ensuring the quality of the published works. Your critical assessments have been instrumental in maintaining the scholarly integrity of this journal.

We are thankful for the support and guidance from the editorial board members, whose vast experience and expertise have steered the direction of RESILIENCE 360.

Furthermore, we acknowledge the efforts of the journal's editorial and organizing team. Your meticulous work behind the scenes, from managing submissions to formatting and publishing, has been essential to bringing this journal to fruition.

Finally, the success of RESILIENCE 360 would not have been possible without the unwavering support of our readers. Your curiosity and enthusiasm for sustainable practices and innovations inspire us to continually strive for excellence.

Dr. Sainu Franco
Editor-in-Chief

Contents

Assessment of Submarine Groundwater Discharge in Selected Coastal region of India KA_RSLNC_2023_01 Santosh Murlidhar Pingale, Sudhir Kumar, Ruchir Patidar, Apeksha Bisht	1
Sustainability from a Geosciences Perspective IL_RSLNC_2023_07 Dr. Nisha Rani	3
Sustainability and Anthropology IL_RSLNC_2023_01 Dr. Bharathi Karri	5
Zero Carbon and Alternative Fuels IL_RSLNC_2023_04 Biju George	6
Green Chemistry Education toward Sustainability IL_RSLNC_2023_03 Dr. Liza Abraham	7
Role of Postharvest Management for Sustainable Food and Nutritional Security IL_RSLNC_2023_05 Dr. Ghulam Hassan Shah	8
Low-carbon Sustainable Geopolymer Concrete from Calcined Clays and Natural Pozzolans IL_RSLNC_2023_02 Dr. Sulapha Peethamparan	11
Land Reuse: A Developed Nation`s Dilemma and Role of Brownfield Redevelopment IL_RSLNC_2023_06 Mrs. Binu Chandy	13

Role of GIS in Sustainable Development IL_RSLNC_2023_08 Dr. Venkata Ravibabu Mandla	14
Use of Shredded Waste Plastic Reinforcement for Sub-Grade Layer of Roads RSLNC_2023_09 Abarar A. Khalak, Dr. Jayesh Juremalani	17
Design of an Integrated Robust Control System for a Hybrid Power Generation System Using Fuzzy Logic RSLNC_2023_13 Gowri Gopan, Manju Mohan, Jishnu Sajeev, Chama R Chandran , Dr. Vinod V P	24
An Evaluation of “Quippo” Application to Promote and Implement the Usage of Electric Vehicles in Sustainable Food Delivery Services RSLNC_2023_16 Prisha Shah, Shaurya Sriganesh, Nihal Muhammed	35
Experimental Investigation by using Eggshell Powder, Human Hair and Lignosulfonate as Additives on Sub-grade Soil Stabilization RSLNC_2023_17 Arsha T, Mohammed Ameer.B, Joshi jose, Bijila MB	40
Assessment of Surface Water Quality by Means of MCDM Approach in Mahanadi River Basin (MRB), Odisha RSLNC_2023_20 Abhijeet Das	51
Comparative Study of Dispersive and Nondispersive Soil Treated With Industrial Byproducts RSLNC_2023_21 Nisse Mariam Wilson	62
Manufacture of Unburnt Clay Bricks using Rice Husk Ash and Cotton Micro Dust RSLNC_2023_23 Hari Sankar K C, Ananthu Krishna S, Shiju P, Nidhin Alex Chandy	65

Prospects of Construction and Demolition Waste as a Building Material: A Review RSLNC_2023_23 Jisha Balakrishnan, Sunilkumar N	70
A Comparative Study on Signature Recognition RSLNC_2023_29 Sainaba B F, Mojith M J, Amina S, Dhanya S, Sarath Krishnan, Abha M	77
Harnessing Artificial Intelligence for Sustainable Development: Applications in the Pursuit of a Greener Future RSLNC_2023_31 Anju Choudhary , Dr. Pradeep Sundaresan	83
Optimal Design of Tuned Façade Damping System for Vibration Control of Tall Buildings RSLNC_2023_32 Arya Gokul, Mohit Verma, Basil Eldhose.	92
A Study on the Preparation and Effectiveness of a Herbal Handwash Using Chinese Chaste Tree Leaf Extract RSLNC_2023_37 Mary Cisilym, Sreelakshmi, Vignesh A, Parvathi M A	99
A Study on the Autogenous Shrinkage Performances of Ultrafine Materials of Concrete RSLNC_2023_39 Jerison Scariah James, Jibin Joy Ponnappal, Dr. Elson John, Aiswarya Jayan	107
Development of Multi-Purpose Permeable Unreinforced Concrete Shell Panels RSLNC_2023_42 Cheley Johny, K. N. Lakshmikandhan, Deepa Balakrishnan S	115
Effect of Super Plasticizer Type on Rheological Properties of Cement Mortar with Pozzolonic Materials RSLNC_2023_45 Ittoop R. Ancheril, Manoj C.M.	122

Characteristics of Sandy Soil Treated Using Enzyme Induced Calcium Carbonate Precipitation RSLNC_2023_46 Kavya Pradeep, Keerthi Raj K	128
Evaluation of Ground Vibration Mitigation using Coir In-filled Trenches RSLNC_2023_49 Malavika V, Revathy V S	132
Pollution Assessment of Vellayani Soil RSLNC_2023_52 Akhila V Mani , Rani V	138
Improvement in Strength and Plasticity Characteristics of Kuttanad Soil Using Enzyme Induced Calcite Precipitation RSLNC_2023_53 Hrudya S Nair, Kannan K	141
Settlement Behaviour of Square Footing Resting on Reinforced Sand and Bottom Ash RSLNC_2023_54 Ananthan M, Aswathy Sasikumar	149
Influence of Aquaculture Waste Sludge on Red Soil-Bentonite Mixture RSLNC_2023_60 Megha B Raj, Revathy V.S	154
Assessment of Coastal Erosion Using Plaxis 2D RSLNC_2023_62 Merin Susan Manu, Rani V	161
Influence of Terrazyme in Subgrade RSLNC_2023_67 Nisha Rani SR	167
Guar Gum Powder as a Green Binder for Soil Treatment RSLNC_2023_70 Mr. Gokul Krishnan, Manjusha M, Devika Chandran, Priyanka K, Neeraja Nair	171

Impact of Retting of Coconut Husk on Water Pollution RSLNC_2023_73	176
Dr. M.C. Philipose, Jain Suzan Zachariah	
Development of Geopolymer Mortar using Red Mud and GGBS RSLNC_2023_74	179
P.B. Keerthanna , Dr. V. Vasugi, P. Manikandan, A. Senthil Kumaran, S. Narendra, Dr. M. Helen Santhi	
Investigation on Seawater Intrusion in Thrikkunnappuzha Panchayath RSLNC_2023_83	187
Er.Reshma Rajendran Beena, Melvin Wilson, Ajo Varghese, Merin Sara Reji , Jabin Joseph Thomas	
Sustainability and Anthropology RSLNC_2023_94	194
Bharathi Karri	
A Study on Fuel Price Increase and Its Impact on the Sale of Electric Vehicles RSLNC_2023_106	201
Dona Pius, Dr. Thushara George	

ABOUT THE CONVENOR



Dr. Sainu Franco, FIE, obtained her Ph.D in Environmental Engineering from VIT University in 2016. At present she heads the Department of Civil Engineering at Providence College of Engineering, Chengannur. She has also served at the Department of Water Supply and Environmental Engineering, Arba Minch University, Ethiopia. Her research has been on the topic “Urbanization and its implications on an emerging Mega-city”. She has published several research papers in reputed journals. She has been part of the “Pollution abatement of stretches/rivers of the state of Kerala”, a project of the Kerala State Irrigation Department. Dr. Sainu led a team from Providence College of Engineering and conducted the Reconnaissance Survey of the polluted stretch of the Pamba River. She was also involved in the Traffic Volume Survey conducted by NATPAC for the project “Feasibility of Providing Access to Skywalk at Kottayam”. She has received awards for Teaching Excellence and for contributions in the field of Research and Development, both from Providence College of Engineering and VIT University, Vellore. She has organized several programmes including a Faculty Development Programme on Professional Ethics which had a tremendous response from faculty members across the country. Seminars involving Indian and International Experts on various topics were also organized by her.



Selfypage Developers Pvt Ltd

E-ISBN: 978-1-68576-443-2



MRP Rs. 250/-