

P R O C E E D I N G S



METAGREEN
DIMENSIONS 2020

COLLEGE OF ARCHITECTURE TRIVANDRUM

2ND INTERNATIONAL CONFERENCE ON PERFORMANCE OF BUILT ENVIRONMENT

SUSTAINABILITY AND LIVABILITY OF CITIES IN DEVELOPING NATIONS _ PERFORMANCE OF BUILDINGS _ CONSERVATION & DOCUMENTATION OF BUILT HERITAGE _ DESIGN FOR SOCIAL INNOVATION _ GREEN PLATFORM: PROCESS & POLICIES

**METAGREEN
DIMENSIONS 2020**



Proceedings of

**2nd International Conference on
Performance of Built Environment**

Organized by

**C.A.T
Trivandrum**

on
20,21,22 February 2020

CONTENTS


Sustainability and Livability of Cities In Developing Nations

01. Process to Achieve Zero Net Carbon Emissions in the Built Environment: Initiatives Launched by Architecture 2030 in USA
Prof. Alfredo Fernández Gonzalez 27
02. Sustainable Urban Form in Developing Countries
Prof. Angela Dub 33
03. Impact of Land Cover of Land Surface Temperature: A Remote Sensing Perspective
Binoy B V, Nina Lazar, Joshima V M 39
04. Planning Strategies for Developing Parvathy Puthanar Canalfront as a People-Oriented Green Corridor: A Study of Kovalam-Akkulam Stretch
Indugeetha B., Sunil Edward 44
05. Blue - Green Infrastructure in Emerging Cities: Akkulam Veli Lake Basin, Thiruvananthapuram
Ganga Krishnan, Unnikrishnan Potti S 49
06. Study of Principles of Human Interactions on Commercial Streets in Kozhikode
Nidhi Krishna E., Anitha Kumari 56
07. A Study on Active Living in Parks: Promoting Active Lifestyle
Sherrill D'silva, Resmi Navin 64
08. Gendered Active Living Patterns in a Popular Urban Park
Reshmi Ravindran, Nagma Manoharan, Miya Jose 72
09. Urban Land Use Planning for Road Safety in Developing Countries: Towards More Livable and Safer Cities
Sharmin Shafeek 79
10. Importance of 'Slow' in Livable Cities
Vijal Patel, Mehul M. Patel, Hardik Gandhi 85
11. A Comparison Between Different Cities Based on City Liveability Index
Siva Barathi A., Pavalavelsh P. 92
12. Green Strategies for Developing Economic Sectors in Rurban Areas: A Study of Meenangadi – Ambalavayal Rurban Cluster in Kerala
Arunima P.M., Nidhish P.J. 97
13. An Approach Paper on Methodology for Determining the Quality of Service at Transport Interchanges (Mobility Hubs)
Jinson Jacob Koottungal 102




Performance of Buildings


01. Architecture in a Warming World
Prof. Norbert Lechner 109
02. Measuring What is Not There
Ar. Sabu Francis 111
03. Sustainability Performance Assessment of Brick, Cement block and Laterite Wall System
Jafar Ali P 115
04. Indoor Environmental Evaluation of Traditional and Contemporary Mud Houses in Kerala
Nina Lazar, Arathi Kanmani, Chitra K 123
05. Empirical Study of the Effect of Thermal Comfort on Student's Performance
Beneetta Mary Jose, Jesna Mathew 128
06. Climatic Investigation of a Contemporary Church in Kochi for Thermal Comfort.
Shruti Susanna Koshy, Priya R. Bangle 135
07. Energy Assessment of Double Skin Facades using Green Walls in Office Buildings at Calicut, Kerala
Shebi K., Arun Balan 143
08. Decoding the Semantics of Cultural Ecology- The Evolution of Sustainable Practices in Liveable Habitats
Salahsha T.N., Sriparvathy Unni 151
09. Sun and Building: Solar Based Design
Roopashree AP 157
10. Evaluation of Thermal Performance of Rammed Earth in Warm-Humid Climate
Arya Narendran 161
11. Shrinkage Reduction in AAC Blocks using Bottom Ash and Silica Sand Replacements: A Focus on Solid Waste Management
Ajas P Fasal, Shashank Bishnoi 166
12. Classroom Lighting Conditions: Impact on Student Performance
Diya Biji, Jaazim Salahudeen 172
13. Performance of Jalis and its Appropriateness in Balcony Spaces in Tropical Warm and Humid Region, Cochin, Kerala
Nithin M.S., Nithin M 177

 **Conservation & Documentation
of Built Heritage**

01. Challenging Conservation of Temples 185
in Chambal Valley
Padma Shri K.K. Muhammed
02. Comparative Studies of the Traditional 187
Water Structures between Jhunjhunu
and Narnaul in India
Yamini Gupta, Takashi Ono
03. Day Lighting Performance of 194
Traditional Temples in Odisha
*Subhra Priyadarshini Nayak, Priya R.
Bangle*
04. *Padippura* and *Pumukham* as 199
Interactive Realms in Traditional
Agrarian Homesteads of Southern
Travancore
Akshatha K, Sharat Sunder R
05. Cultural Landscape as a Framework 206
for Sustainability: Case of Kaveri Basin
Balaji Venkatachary, Vishakha Kawathekar
06. Cultural Values in the Architecture and 211
Planning of Mountainous Settlements:
The Case of Ladakh
Kumar Tusharkanti
07. Evolving Cultural Landscape: Analysis of 216
the UNESCO Framework for Conservation
of Cultural Landscapes in India
Ritu Sara Thomas
08. Community Participation in Heritage 221
Management at Chandori
Suruchi Ranadive, Purva Shah
09. Evolution of Church Architecture of 229
Kerala: A Study of the Pre Portuguese
and Post Portuguese Era
Tino Mary Thomas, Sunil Sharma
10. Sustainable Adaptation of Traditional 236
Mising House- A case of North
Lakhimpur, Assam
Rupa Jawal

 **Design for Social Innovation**

01. Design for Social Innovation 243
Prof. Meenakshi Singh
02. Adaptability of Water Hyacinth Pulp 247
in Making Compatible Products for
Architectural Interiors
*Stephen Cyriac Paimpilly, Manoj Kumar
Kini*
03. Agricultural Waste a Solution for Plastics: 253
Challenges and Opportunities
Revathi Sreekumar, Anooja J.

 **Green Platform:
Process & Policies**

01. Environment Technologies for 263
Sustainable Development
Dr. Krishnakumar B.
02. Cost Benefit Analysis of the 265
Management of Dismantled and
Demolished Waste: A Study of the
Sathram, Guruvayur
Meetu Asokan, Prasanna T.K.
03. Role of Mangroves in Coastal and 272
Estuarine Stewardship: A Case of Sea
Level Rise in Trivandrum, Kerala
Naveena Mariam Jacob
04. Adaptability as a Means of Extending 281
the Useful Life of a Building
Shilpa Shirish
05. Greening Ganesh Festival in Pune: 286
A Focus on Solid Waste Management
*Shamli Thombare, Shreyasi Ansingkar
Joshi, Aditi Lanke*
06. Life Cycle Analysis and Environmental 291
Impact Assessment of Photovoltaic
Panels at Cochin International Airport
Limited, Kerala
*Warrier Chitra Unnikrishnan, Tino Mary
Thomas*
07. Innovative Construction Using Flood 296
Deposits
Sibin Sabu, Indugeetha B.

Chief Patron
Ar. N. Mahesh Hon'ble Chairman, C.A.T

Organising Chairman
Prof. J. Jayakumar Principal, C.A.T

Organising Convenor: Induja V. Assoc. Professor, C.A.T

Co Convenor: Jesna Mathew Asst. Professor, C.A.T

Theme Coordinators

Sustainability and Livability of Cities in Developing Nations
Deepthi Senan, Reshmi Ravindran

Performance of Buildings
Charudathan M.B., Jaazim Salahudeen

Conservation and Documentation of Built Heritage
Priya Romal, Aswathy M.R.

Design for Social Innovation
Anooja J., Akhil Raveendran

Green Platform: Process and Policies
Induja V., Jesna Mathew

Organising Committee

Prof. Geetha K.P, Prof. Neena Thomas,
Prof. Bijey Narayan, Anooja J.

Design Team: Anooja J., Akhil Raveendran, Arjun Prasanth,
Jayaprakash V.N., Jerin George, Jerry Sam Joseph, Ronson Rajan

Logistics and Facility Management:

Anoop Albert, Ajay Ashok, Dinu Krishnan, Denny Dilip

Technical Support: Arun Viswanathan, Niby Thomas

**Conference Proceedings -
Metagreen Dimensions 2020**

Published by:
College of Architecture Trivandrum,
Mulayara Post, Thinavila,
Trivandrum, Kerala. INDIA. 695543

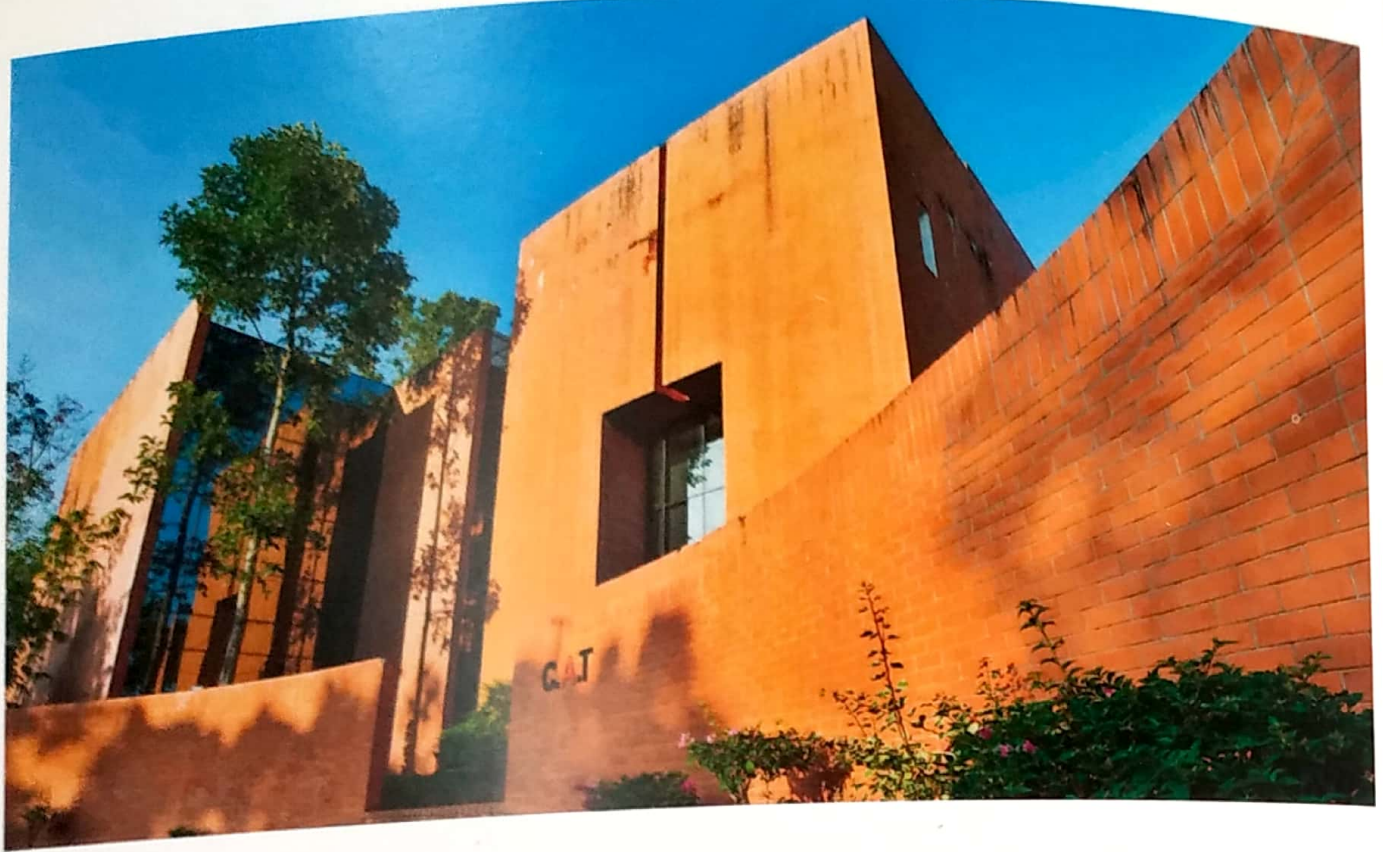
© 2020 by College of Architecture Trivandrum

All rights reserved. No part of this publication may be reproduced, distributed or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law. For permission requests, write to the publisher.

While every effort has been made to ensure that the information presented in the book is correct at time of going into the press, College of Architecture Trivandrum (C.A.T) would not be responsible for any changes that have occurred during the course of publication.

The photographs used in the publication have been provided to C.A.T. by respective authors/speakers unless mentioned otherwise.

ISBN 978-93-5396-411-5
<http://cat-tvm.in/uploads/MG2020-Conference-Proceedings.pdf>



College of Architecture Trivandrum (C.A.T) is one of the largest architectural schools in Trivandrum, the capital city of the state of Kerala, India. C.A.T was established in the year 2011 as a privately owned educational institution. C.A.T attracts students from all parts of Kerala and also from the nearby states. Two inter-related professional degree courses, namely, B.Arch and B.Des (Furniture & Interior Design) are being conducted here.

The College of Architecture Trivandrum envisages an interdisciplinary and interconnected curriculum with an intention to prepare a new genre of architects and interior designers who would be able to use creatively the evidences collected from real data while developing concepts. This forms the basis of design with an emphasis on formal aesthetics of the 21st century. Research in theory and research-driven practice of faculty members formed another layer to the design education. The constant effort to meet the vision of becoming the "institute of choice for the best student" has made the environment academically challenging and interesting to both students and teachers.

C.A.T

COLLEGE OF ARCHITECTURE TRIVANDRUM

College of Architecture Trivandrum (C.A.T)
Mulayara Post, Thinavila, Trivandrum, Kerala - 695543
www.cat.edu.in <http://cat-tvm.in>
admin@collarc.com info@collarc.com 0472288822

Community Participation in Heritage Management at Chandori

Suruchi Ranadive¹, Purva Shah²

^{1,2}NDMVP Samaj's College of Architecture, Nashik

ABSTRACT: Chandori is a small village along the banks of the river Godavari, about 25 km away from Nashik in Maharashtra. Due to severe drought in Maharashtra several Hindu temples and the built ghats (i.e. the steps leading down to the river) had resurfaced from the river bed in April 2016. The temples and ghats submerged when the course of the river was changed due to the construction of a dam during the British era. The last time these Hindu temples were seen was in 1982 when Nashik had witnessed a drought of similar proportions. The symbiotic relation between the ghats and temples found elsewhere in India is found reflected here on a small scale. The ghats and temples which resurfaced are of the Hemadpanthi style and date back to the Peshwa era. The villagers have taken the initiative to get these temples documented. The community is actively forming a management plan which will benefit the economy of the village and increase the livelihood of the villagers. The paper aims to examine the management plan of the villagers which intends to keep the lost heritage of the submerged temples alive, the focus being the temples. Parallel case studies will be investigated to check the validity of the management plan. This research will help the heritage plan to adhere to the principles of sustainability and embrace the principles of ecotourism by limiting the visitor movement and safeguarding the ecology of the area and the river ecosystem.

KEYWORDS: Community participation, lost heritage, sustainability, management plan.

1. INTRODUCTION

Defined in the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage, 'underwater cultural heritage' encompasses all traces of human existence that lie or once lay under water for at least 100 years and have a cultural or historical character. This includes ancient shipwrecks, submerged temples and cities, sunken heritage in Cenotes, wells and lakes as well as fish traps and others sites.

Underwater cultural heritage holds vast potential for scientific research and education. Submerged prehistoric sites are of crucial importance for understanding the development of human civilisation. In addition to its scientific significance, underwater cultural heritage also opens up numerous opportunities for recreation, cultural enrichment and sustainable development. It is an interesting and attractive form of heritage, highly appreciated by the public due to the stories it symbolises and due to the air of mystery which surrounds its underwater location.

2. METHODOLOGY

This paper seeks to understand the importance of underwater heritage and ensure ways of keeping it alive in the minds of people in a sustainable manner. This objective is met by understanding the area through primary field studies and observation. Ethnographic approach reveals the links between the

lost heritage and the community. It discusses in detail the management plan drawn up by the residents of Chandori. The management plan proposes to develop infrastructure and create economic opportunities for the residents while focussing on the green initiatives. Secondary data collection is done through research papers and comparison of management plan with Haithabu case study which helps to analyse the strengths and weaknesses of the Chandori heritage management plan. SWOT analysis will help make amendments to the plan if any and draw appropriate conclusions.

3. CASE UNDER STUDY

The temples of Chandori are a very good example of underwater cultural heritage. Chandori is a small village along the banks of the river Godavari, about 25 km away from Nashik in Maharashtra. The river Godavari makes a moon crescent like shape as it winds its way towards Nandurmahmeshwar, hence the village is named Chandori. (see Figureure. 1) Due to severe drought in Maharashtra several Hindu temples and the built ghats (i.e. the steps leading down to the river) had resurfaced from the river bed in Chandori on April 2016. The temples and ghats got submerged (see Figure. 3) when the course of the river was changed due to the construction of a dam during the British era (1906). These shrines used to be