



# **INTERNATIONAL JOURNAL OF BUILT ENVIRONMENT & SUSTAINABILITY**

eISSN 2289-8948

**Vol 8, No 3 (2021)**

<https://ijbes.utm.my/>



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

# IJBES

## International Journal of Built Environment and Sustainability

### CHIEF EDITOR

**Professor Ts. Dr. Mohd Hamdan Ahmad**, Universiti Teknologi Malaysia

### MANAGING EDITOR

**Sr Dr. Shamsul Hadi Bandi, PQS, MRISM** Universiti Teknologi Malaysia

### SECTION EDITORS

**Assoc. Prof. Dr. Alice Sabrina Ismail**, Universiti Teknologi Malaysia, Malaysia

**Dr. Gabriel Ling**, Universiti Teknologi Malaysia, Malaysia

**Dr. Norhazren Izatie Mohd**, Universiti Teknologi Malaysia, Malaysia

**Dr. Nurul Hawani Idris**, Universiti Teknologi Malaysia, Malaysia

**Dr. Shazmin Shareena Ab Azis**, Universiti Teknologi Malaysia, Malaysia

**LAr Dr. Siti Rahmah Omar**, Universiti Teknologi Malaysia, Malaysia

### EDITORIAL BOARD

**Professor Ts. Dr. Mohd Hamdan Ahmad**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Roslan Amirudin**, Universiti Teknologi Malaysia, Malaysia

**Dr. Ariva Sugandi Permana**, King Mongkut Institute of Technology Ladkrabang, Thailand

**Sr Dr. Shamsulhadi Bandi**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. ATM Nurul Amin**, BRAC University, Bangladesh

**Assoc. Professor Dr. Kherun Nita Ali**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Shahed Khan**, Curtin University of Technology, Australia

**Assoc. Professor Dr. Bhishna Bajracharya**, Bond University, Australia

**Assoc. Professor Dr. Maimunah Sapri**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Ir. Ansar Ul Haque Yasar**, Hasselt University Belgium, Belgium

**Assoc. Prof. Dr. Alice Sabrina Ismail**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Mohammad Arif Kamal**, Aligarh Muslim University, India

**Assoc. Professor Dr. Mahmud Mohd Jusan**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Zulkepli Majid**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Wong Sing Sing**, University College of Technology Sarawak, Malaysia

**Assoc. Professor Dr. Tetsu Kubota**, Hiroshima University, Japan

**Assoc. Professor Dr. Chandrasekar Parsuvanathan**, National University of Singapore, Singapore

**Dr. Shazmin Shareena Ab Azis**, Universiti Teknologi Malaysia, Malaysia

**Dr. Gabriel Ling Hoh Teck**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Awais Piracha**, Western Sydney University, Australia

**Dr. Soheil Sabri**, The University of Melbourne, Australia

**Assoc. Professor Dr. Khairul Anwar Khaidzir**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Raja Nafida Raja Shahminan**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. M. Rafee Majid**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Julaihi Wahid**, Universiti Sains Malaysia, Malaysia

**Professor Dato' Dr. Mansor Ibrahim**, International Islamic University of Malaysia, Malaysia

**Assoc. Professor Dr. Vilas Nitivattananon**, Asian Institute of Technology, Thailand

**Professor Dr. Ismail Said**, Universiti Teknologi Malaysia, Malaysia

**Dr. Nurul Hawani Idris**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Kwon Tae Ho**, Semyung University, Korea

**Dr. Anoma Kumarasuriyar**, Queensland University of Technology, Australia

**Emeritus Professor Dr. Jayant Kumar Routray**, Asian Institute of Technology, Thailand

**Professor Ir. Dr. Roos Akbar**, Bandung Institute of Technology, Indonesia

**Assoc. Professor Dr. Gurupiah Mursib**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Michihiko Shinozaki**, Shibaura Institute of Technology, Japan

**Dr. Siti Rahmah Omar**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Ranjith Perera**, Sultan Qaboos University, Oman

**Dr. Tareef Hayat Khan**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Hasanuddin Lamit**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Sudaryono Sastrosasmito**, Gadjah Mada University, Indonesia

**Assoc. Professor Dr. Zalina Shari**, Universiti Putra Malaysia, Malaysia

**Dr. Norhazren Izatie Mohd**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Nur Emma Mustapa**, Universiti Teknologi Malaysia, Malaysia

**Assoc. Professor Dr. Fadhlil Abdullah**, Universiti Teknologi Malaysia, Malaysia

**Professor Dr. Nasiru Medugu Idris**, Nasarawa State University, Nigeria

**Dr. Adati Ayuba Kadafa**, Nasarawa State University, Nigeria



Mail Address:

## **International Journal of Built Environment and Sustainability**

Faculty of Built Environment and Surveying

Universiti Teknologi Malaysia

81310, Johor Bahru, Malaysia

Telephone: +60-7-5537382

Email: ijbes@utm.my

Copyright © FAB, UTM, 2021

Cover Design and Type-set by: Shamsulhadi/Hairunnisa/Azman

### **DISCLAIMERS:**

This publication is intended to enrich the knowledge in the field of built environment and sustainability. Therefore, you may use the materials contained herein for free as long as for the use of academic purpose. However, you must cite this scientific material properly.

The views expressed in this publication do not necessarily reflect the views of the Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia.



The IJBES is an international peer-reviewed Journal  
Published in collaboration between Faculty of Built Environment and Surveying and Penerbit UTM

**E-ISSN: 2289-8948**

**ISSN: 1511-1369**

# IJBES

## Vol. 8, No. 3, 2021

### Table of Contents

#### Articles

1. The Accuracy of Satellite Derived Bathymetry in Coastal and Shallow Water Zone	1-8
<i>Kelvin Kang Wee Tang<sup>1</sup> and Mohd Razali Mahmud<sup>2</sup></i>	
<sup>1</sup> <i>Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</i>	
<sup>2</sup> <i>Geospatial Imaging &amp; Information Research Group (GI2RG), Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</i>	
2. Mapping and Estimation of Above-ground Grass Biomass using Sentinel 2A Satellite Data	9-15
<i>Isa Muhammad Zumo<sup>1</sup>, Mazlan Hashim<sup>2</sup> and Noor Dyana Hassan<sup>2</sup></i>	
<sup>1</sup> <i>Department of Surveying and Geoinformatics, Federal Polytechnic, Damaturu, Nigeria</i>	
<sup>2</sup> <i>Geoscience and Digital Earth Centre, (INSTeG), Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</i>	
3. The Riyadh Urban Growth Boundary: An Analysis of the Factors Affecting its Efficiency on Restraining Sprawl	17-25
<i>Mohamed Saleh Amer<sup>1</sup>, Mohammad Rafee Majid<sup>1</sup> and Tahar A. Ledraa<sup>2</sup></i>	
<sup>1</sup> <i>Department of Urban and Regional Planning, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</i>	
<sup>2</sup> <i>Department of Urban Planning, College of Architecture and Planning, King Saud University, Riyadh, Saudi Arabia</i>	
4. Feasibility of Vertical Rainwater Harvesting via In-situ Measurement of Wind-driven Rain Loads on Building Facades in a Tropical Climate	27-45
<i>Mozghan Samzadeh<sup>1</sup>, Nazli Che Din<sup>1</sup>, Zunaibi Abdullah<sup>1</sup>, Muhammad Azzam Ismail<sup>1</sup> and Norhayati Mahyuddin<sup>1</sup></i>	
<sup>1</sup> <i>Faculty of Built Environment, University of Malaya, Jln Profesor Diraja Ungku Aziz, 50603 Kuala Lumpur</i>	
5. The Impact of the COVID-19 on the Construction Industry in Vietnam	47-61
<i>Van Tam Nguyen<sup>1</sup>, Bao Ngoc Nguyen<sup>1</sup>, Toan Quoc Nguyen<sup>1</sup>, Anh Tung Chu<sup>1</sup> and Hai Tuan Dinh<sup>2</sup></i>	
<sup>1</sup> <i>Faculty of Construction Economics and Management, National University of Civil Engineering, Hanoi, Vietnam</i>	
<sup>2</sup> <i>Faculty of Urban Management, Hanoi Architectural University, Hanoi, Vietnam</i>	
6. Application of the INDI Model of the HQE <sup>2</sup> R Approach to Assess the Sustainability of a Neighbourhood: Case of Jijel City in Algeria	63-75
<i>Fouad Roula<sup>1</sup> and Ammar Bouchair<sup>2</sup></i>	
<sup>1</sup> <i>Department of Architecture, Institute of Architecture and Town-Planning, University of Batna 1 Hadj Lakhdar, Algeria</i>	
<sup>2</sup> <i>Department of Architecture, Faculty of Sciences and Technology, University Mohamed Seddik Benyahia, 18000, Jijel, Algeria</i>	
7. Assessing The Thermal Comfort Conditions In Open Spaces: A Transversal Field Survey On The University Campus In India	77-92
<i>Pardeep Kumar<sup>1</sup> and Amit Sharma<sup>1</sup></i>	
<sup>1</sup> <i>Department of Mechanical Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Morthal, Sonepat-India</i>	

# IJBES

## Vol. 8, No. 3, 2021

### Table of Contents

---

8.	<b>The Value of Gotong-royong in the Mountainous Settlement of Kepuharjo Village at Pagerjurang Permanent Shelter in Yogyakarta, Indonesia</b>	93-106
	<i>Freddy Marihot Rotua Nainggolan<sup>1</sup>, Tarcicius Yoyok Wahyu Subroto<sup>2</sup> and Agam Marsoyo<sup>2</sup></i>	
	<i><sup>1</sup>Faculty of Architecture and Design, Duta Wacana Christian University, Special Region of Yogyakarta 55224, Indonesia</i>	
	<i><sup>2</sup>Faculty of Engineering, Universitas Gadjah Mada, Special Region of Yogyakarta 55281, Indonesia</i>	
9.	<b>Post Occupancy Evaluation of the Built Environment: A Case Study of Mosque Facilities</b>	107-119
	<i>Mohammad A. Hassanain<sup>1</sup>, Mohammed Kajak<sup>1</sup>, Mohammad B. Hamida<sup>2</sup> and Ahmed M. Ibrahim<sup>3</sup></i>	
	<i><sup>1</sup>Architectural Engineering Department, King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
	<i><sup>2</sup>Department of Management in the Built Environment, Delft University of Technology, Netherlands</i>	
	<i><sup>3</sup>Department of ICT and Natural Sciences, Norwegian University of Science and Technology, Norway</i>	
10.	<b>Window Ventilation Behavior for Overheating Evaluation: Residents' Survey and Derived Ventilation Profiles</b>	121-133
	<i>David Schiela<sup>1</sup> and Christoph Schünemann<sup>1</sup></i>	
	<i><sup>1</sup>Leibniz Institute of Ecological Urban and Regional Development, Weberplatz 1, 01217 Dresden, Germany</i>	

### Communication

11.	<b>Performance Measures of a Built Environment Multidisciplinary Research Journal: IJBES Metrics in a Review</b>	135-142
	<i>Shamsulhadi Bandi<sup>1</sup></i>	
	<i><sup>1</sup>Managing Editor, International Journal of Built Environment and Sustainability (IJBES), Penerbit UTM Press, Universiti Teknologi Malaysia</i>	