

# SUSTAINABILITY MANAGEMENT STRATEGIES AND IMPACT IN DEVELOPING COUNTRIES

**Edited by** Mohd Fadhil Md Din, Nor Eliza Alias,  
Norelyza Hussein and Nur Syamimi Zaidi

COMMUNITY, ENVIRONMENT  
AND DISASTER RISK MANAGEMENT

**VOLUME 26**

**SUSTAINABILITY MANAGEMENT  
STRATEGIES AND IMPACT IN  
DEVELOPING COUNTRIES**



COMMUNITY, ENVIRONMENT AND DISASTER RISK  
MANAGEMENT VOLUME 26

**SUSTAINABILITY  
MANAGEMENT STRATEGIES  
AND IMPACT IN  
DEVELOPING COUNTRIES**

EDITED BY

**MOHD FADHIL MD DIN**

*Universiti Teknologi Malaysia, Malaysia*

**NOR ELIZA ALIAS**

*Universiti Teknologi Malaysia, Malaysia*

**NORELYZA HUSSEIN**

*Universiti Teknologi Malaysia, Malaysia*

and

**NUR SYAMIMI ZAIDI**

*Universiti Teknologi Malaysia, Malaysia*



United Kingdom – North America – Japan  
India – Malaysia – China

Emerald Publishing Limited  
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

Editorial matter and selection © 2022 Mohd Fadhil Md Din, Nor Eliza Alias, Norelyza Hussein, and Nur Syamimi Zaidi.

Individual chapters © 2022 the authors.

Published under exclusive licence by Emerald Publishing Limited.

#### **Reprints and permissions service**

Contact: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

#### **British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-80262-450-2 (Print)

ISBN: 978-1-80262-449-6 (Online)

ISBN: 978-1-80262-451-9 (Epub)

ISSN: 2040-7262 (Series)



ISOQAR certified  
Management System,  
awarded to Emerald  
for adherence to  
Environmental  
standard  
ISO 14001:2004.

Certificate Number 1985  
ISO 14001



INVESTOR IN PEOPLE

# CONTENTS

<i>List of Tables and Figures</i>	<i>ix</i>
<i>About the Authors</i>	<i>xiii</i>
<i>Preface</i>	<i>xxix</i>

## PART A MANAGEMENT AND STRATEGIES

<b>Chapter 1 A Review on Carbon Tax for Malaysia Construction Industry</b> <i>Christine Nerisha Anak Stephen Liat, Eeydzah Aminudin, Eric Lou, Gabriel Ling Hoh Teck, Leng Pau Chung, Rosli Bin Mohamad Zin and Rozana Zakaria</i>	<b>3</b>
<b>Chapter 2 Disaster Risk Management: An Overview of Disaster Risk Assessment in ASEAN Countries</b> <i>Muhammad Wafiy Adli Bin Ramli, Nor Eliza Binti Alias, Zulkifli Bin Yusop and Shazwin Binti Mat Taib</i>	<b>15</b>
<b>Chapter 3 Decision Criteria for Retrofitting Existing Campus with Green Roof</b> <i>Nur Izieadiana Binti Abidin, Rozana Zakaria and Siti Mazzuana Shamsuddin</i>	<b>29</b>
<b>Chapter 4 Introducing New Parameter in Green Building Incentives to Enhance Sustainable Development Paradigm in Malaysia</b> <i>Siti Zubaidah Binti Hashim, Nadira Binti Ahzahar, Intan Bayani Bin Zakaria and Norehan Norlida Mohd Noor</i>	<b>37</b>
<b>Chapter 5 Recommendations for Minimising Construction Claims: Achieving Sustainable Relationships among Stakeholders</b> <i>Do Tien Sy, Zwe Man Aung and Nguyen Thanh Viet</i>	<b>45</b>

<b>Chapter 6 The Key Practices of Lean Supply Chain Management Towards Sustainable Performance: A Review</b> <i>Istimaroh, Noor Aslinda Binti Abu Seman, Bambang Setiaji and Norasmiha Binti Mhd Nor</i>	61
<b>Chapter 7 Time Cost Quality Trade-off in Repetitive Construction Project for Sustainable Construction Project</b> <i>Duc-Hoc Tran and Putri Basenda Tarigan</i>	75
<b>Chapter 8 Waste Minimization Governance through Standardised Recycling Rate in Higher Education Institutions in Malaysia</b> <i>Siti Nur Syamimi Mohd Na'im, Mohd Fadhil Mad Din, Santhana Krishnan, Shazwin Mat Taib and Fadzlin Md Sairan</i>	87
<b>Chapter 9 Web-based Big Data Integration Visualisation Solutions</b> <i>Omar Sedeeq Yousif and Rozana Zakaria</i>	103
<b>PART B IMPACT AND ASSESSMENT</b>	
<b>Chapter 10 Creating the Sustainability Environment for Students Well-being: The Awareness Level of Victims after Fire Incident in Private Islamic School</b> <i>Norehan Norlida Mohd Noor, Nadira Binti Ahzahar, Intan Bayani Bin Zakaria, Siti Zubaidah Binti Hashim and Norazura Mizal Azzmi</i>	121
<b>Chapter 11 Assessing the Criteria of Eco-industrial Park Site Selection for the Sustainable Development Goals Initiatives</b> <i>Steven Kuba Nuhu, Mohd Nadzri Md Reba, Zaimuddin Abd Manan, Sharifah Rafidah Wan Alwi and Fatin Nabihah Syahira Ridzuan</i>	135
<b>Chapter 12 Causal Factors of Accident Related to Design Aspect in Construction Industry</b> <i>Herda Balqis Binti Ismail, Noor Nabilah Binti Sarbini, Hamizah Liyana Binti Tajul Ariffin, Izni Syahrizal Bin Ibrahim and Mohd Fairuz Bin Ab Rahman</i>	149
<b>Chapter 13 Covid 19 and Its Impact on Malaysian Women Travel Behaviour</b> <i>Masria Mustafa, Zanariah Abd. Rahman, Noor Azreena Kamaluddin and Takeru Shibayama</i>	165

- Chapter 14 Critical Success Factors of Contractors in Affordable High-Rise Public Housing in Malaysia**  
*Ainarull Assikin Abdul Hadi , Syuhaida Ismail,  
Nur Izzati Ab Rani and Nur Fatin Syazwani  
Abu Bakar* 179
- Chapter 15 Green Roof System: Implementation and Challenge in Commercial Buildings**  
*Nazhatulzalkis Jamaludin, Siti Zubaidah Binti Hashim,  
Intan Bayani Bin Zakaria, Nadira Binti Ahzahar and  
Mior Alhadi Mior Ahmad Ridzuan* 195
- Chapter 16 Identification of Barriers and Challenges Faced by Construction Key Players in Implementing the Green Building Incentives in Malaysia**  
*Nadira Binti Ahzahar, Siti Zubaidah Binti Hashim,  
Intan Bayani Bin Zakaria, Norehan Norlida Mohd Noor and  
Nur Anis Bt Abdul Rahman* 209
- Chapter 17 Local Stakeholders and Consumer Awareness on Fluorocarbon Gas Management in Malaysia**  
*Nurul Nazleatul Najiha Binti Mohd Nazif,  
Shazwin Binti Mat Taib, Mohd Fadhil, Md Din,  
Nurfarahain Mohammed Rusli and Dianah Mazlan* 219
- Chapter 18 Public Opinion Analysis for Management of Urban Infrastructure Systems: Social Media Data Mining Approach**  
*Nguyen Thanh Viet, Denver Banlasan and Do Tien Sy* 233
- Chapter 19 The Influence of Language Proficiency on Occupational Safety of Foreign Workers in the Sustainable Construction Industry**  
*Hamzat Isah, Norhidayah Md Ulang and  
Norazura Mizal Azzmi* 243
- Chapter 20 Under-Reporting of Occupational Accidents in the Nigerian Construction Industry**  
*Adetunji Kamoli, Razali Adul Hamid and  
Syamsul Hendra Bin Mahmud* 253
- Chapter 21 Gas Permeability Associated with Cleat Pattern in a Coal Bed of Low Rank Coals, South Sumatra Basin**  
*Afikah Binti Rahim, Taslim Maulana, Ferian Anggara and  
Mohammed Hail Hakimi* 265



<b>Chapter 22 Evaluation of Strength and Deformability of Jointed of Metasedimentary Rock at NATM-1, Karak, Pahang</b>	
<i>Afikah Binti Rahim, Hareyani Zabidi and Najib</i>	279
<i>Index</i>	297

# LIST OF TABLES AND FIGURES

## TABLES

Table 1.1.	The Top 10 Keywords of the ‘Carbon Tax’ and ‘Construction Industry’-related Publications.	9
Table 1.2.	The Methodology Used by Other Authors to Analyse the Impacts of the Carbon Tax.	10
Table 2.1.	The Practices of Disaster Risk Assessment (DRA) from Several ASEAN Members.	20
Table 3.1.	Barlett’s Test of Sphericity and KMO Analysis.	32
Table 3.2.	FL and FS for Green Roof.	33
Table 4.1.	Frequency Calculation for All Respondent Groups: ‘Agreed on Types of Green Building Incentives in Malaysia’.	42
Table 4.2.	New Parameter of GBIs.	43
Table 5.1.	Claim Attributes with Significantly Different Perceptions of Owner + Consultant and Contractor Groups under an Independent Sample <i>t</i> -Test.	52
Table 5.2.	Comparison of Top Five Claim Attributes between This Study and Previous Studies.	53
Table 6.1.	Critical factors of Lean Supply Chain into Sustainable Performance.	67
Table 7.1.	Project Data of the Case Study.	81
Table 7.2.	Optimum Solutions from the Case Study.	83
Table 8.1.	National Recycling Target Setting in Asian Countries, EU and the USA.	93
Table 9.1.	Comparison of Visualisation Solutions, Servers, Languages, and Databases.	113
Table 9.2.	Comparison between the Platforms.	114
Table 10.1.	Chronology of Fire Cases That Have Occurred in Private Islamic Schools in Malaysia.	125
Table 10.2.	The Availability of Fire Prevention System in Private Islamic School.	129
Table 10.3.	To Identify the Impact or Response to Fire Awareness among Respondents.	131
Table 13.1.	The Demographic Variables of Respondents.	171
Table 14.1.	Reliability Analysis.	187
Table 14.2.	Results on Critical Success Factors (CSFs) of Contractors in Affordable High-Rise Public Housing in Malaysia.	189
Table 15.1.	Ranking of the Barriers That Become a Challenge in Implementing Green Roof during the Building Operation Stage in Maintaining the Green Roof System.	203

Table 16.1.	Table of Rank for Barriers and Challenges in Implementing Financial Incentives.	215
Table 16.2.	Table of Rank for Other Related Barriers and Challenges in Implementing Green Building Incentives.	217
Table 17.1.	Statistical Analysis for Local Stakeholders and Consumers Awareness on FC Gas Management.	224
Table 18.1.	Topic Model Output for UIS Component Water Supply, Sewerage, and Sanitation.	238
Table 18.2.	Public Opinion Sentiment Distribution for all UIS Components.	239
Table 19.1.	The Number of Foreign Workers from Different Countries to Malaysia.	246
Table 20.1.	Reasons for Under-Reporting of the Occupational Accident at the Organisations Level.	260
Table 21.1.	Coal Rank Analysis Based on the Inherent Moisture.	269
Table 21.2.	Relationship Between the Cleats Attribute and the Permeability.	275
Table 22.1.	The Curve Developed and the Physico-Mechanical Characteristics of the Tested Rock After Being Subjected to Tensile Tension.	283
Table 22.2.	The Classification of Strain–Stress Curve Pattern and Their Relevant Rock Properties.	290

## FIGURES

Fig. 1.1.	Keyword's Co-occurrence Network of the Carbon Tax and Construction Industry-related Publications. Adapted from the Software VOSviewer Using the Data Extracted from Scopus Database.	8
Fig. 2.1.	The Risk Index Graph for WRI and INFORM for ASEAN Countries in 2019.	24
Fig. 5.1.	Research Flowchart.	48
Fig. 6.1.	The Overview of This Study is Described by (a) Number of Papers of Publication Year, (b) Number of Papers in Research Method of Publication Year, (c) Publisher and Count of Publishing, and (d) Critical Practices for Lean Supply Chain Management	68
Fig. 7.1.	Scheduling and Estimating Process. (a) Objective Function Process in Uncertainty Condition. (b) Triangular Fuzzy Number (TFN) for Uncertain Time. (c) Quality Performance Index (QPI).	78
Fig. 7.2.	Time–Cost–Quality Trade-off of the Optimum Solution in the Case Study.	83

Fig. 8.1.	(a) UTM Total Waste Generated, Total Recyclables and Recycling Rate in 2017–2019; (b) UM Total Waste Generated, Total Recyclables and Recycling Rate in 2017–2019; (c) UKM Total Waste Generated, Total Recyclables and Recycling Rate in 2019; and (d) UPM Total Waste Generated, Total Recyclables and Recycling Rate in 2018 and 2019.	96
Fig. 9.1.	Data Visualisation Process.	107
Fig. 9.2.	(a) Data Visualisation using Power BI for Green Highway Performance Monitoring; (b) Web-based Application for Green Highway Performance Monitoring.	109
Fig. 11.1.	(a) Fuzzy Analytic Hierarchy Process Flow Sheet. (b) EIP Site Selection Criteria Structure.	141
Fig. 11.2.	Fuzzy-analytic Hierarchy Process Overall Criteria Weight Importance for EIP Site Selection.	142
Fig. 12.1.	Statistics of Fatal Accidents in Malaysia Between 2016 and 2020. (a) Fatal Accidents in All Industries and Construction Industry; (b) Fatal Accidents According to the Project Lifecycle Phase.	154
Fig. 12.2.	Causal Factors of Fatality between 2016 and 2020. (a) Category of Fatal Accidents; (b) Fatal Accident During Construction Phase and Post-Construction Phase.	155
Fig. 12.3.	Summary of Fatal Accident Cases.	161
Fig. 13.1.	Lockdown Policy for Malaysia.	170
Fig. 13.2.	(a) The Mode of Transportation Usage for Workplace, Education and Groceries Trip (Before Covid-19); (b) Travel Status During Covid-19 (Work); (c) Travel Status During Covid-19 (Education); (d) Travel Status Before Covid-19 (Groceries); (e) Travel Status During Covid-19 (Groceries); and (f) Childcare Situations by Workplace Types.	173
Fig. 15.1.	Respondents' Working Experience in Years and Their Involvement in the Green Roof System Stage in the Building.	202
Fig. 17.1.	Percentage of Consumers Based on Education Background: (a) I Have Heard About FC Gas Before; (b) All Types of FC Gas Can Contribute the Same Effect on Ozone Depletion and Global Warming, When It's Leaking to the Atmosphere; (c) Malaysia Is Phasing Out HCFC Gas and Phasing Down HFC Gas; (d) Leakage of FC Gas Can Reduce the efficiency of Air Conditioning or/and Refrigeration Unit; (e) It Is Important to Manage Air Conditioning or/and Refrigeration Unit in a Good Manner.	225

Fig. 21.1.	Graphics Showing the Relationship between the Intensity (a), Average Density (b) and Average Length (c) with the Permeability. Graphic (d) Is the Combined Graphic of Intensity, Average Density and Average Length, (e) Relationship between Cleat Aperture and Permeability and (f) Relationship between the Cleat Spacing and the Permeability.	271
Fig. 21.2.	Comparison of Permeability Values in the Research Done by the Researcher and Weniger et al. (2016), with Modifications.	274
Fig. 22.1.	(a) Image of a Sample with the Image Analyser and (b) Laboratory Setting of Brazilian Tensile Test.	281
Fig. 22.2.	(a) In Type II Tests, Strain Patterns over the Loaded Diameter Right before the Peak Load; (b) (i) Three Positions of a Sample Showing the Failure Mechanism; (ii) Failure of Mechanism between Tensile and Shear Strains in These Areas (i).	288

## ABOUT THE AUTHORS

**Nur Izieadiana Binti Abidin** obtained a Bachelor's degree in Quantity Surveying and a Master's degree in Construction Management at Universiti Teknologi Malaysia (UTM). In 2019, she graduated with a Doctor of Philosophy and started her career as a Senior Lecturer at the School of Civil Engineering, Faculty of Engineering, UTM Johor Bahru campus. She has published research papers in various international journals and conference proceedings. Her research interest encompasses building retrofitting, energy efficiency, construction safety, and construction management. She was also a Member of the Scientific Committee and Technical committee in various conferences.

**Nadira Binti Ahzahar**, Department of Built Environment Studies & Technology, Faculty of Architecture Planning and Surveying, Universiti Teknologi MARA, Perak Branch. She is a Senior Lecturer at Universiti Teknologi MARA Perak Branch under the Department of Built Environment Studies & Technology. She has 15 years of lecturing experience in various courses in Built Environment. Her research interests are in green building and sustainable construction management. She has also published technical papers on similar topics in local and abroad.

**Nor Eliza Binti Alias**, PhD, Centre for Environmental Sustainability and Water Security (IPASA), School of Civil Engineering, Faculty of Engineering, UTM. She is a Senior Lecturer and a Research Fellow of the Centre for Environmental Sustainability and Water Security (IPASA), UTM. She has been involved in national and international research and consultancy projects related to water security, flood risk management, and climate change. She is an international scientist related to water security under the Japan International Cooperation Agency (JICA) and Japan Society for the Promotion of Science (JSPS) ASIAN Core Programme, Japan, as well as the Global Challenges Research Fund (GCRF), United Kingdom. She has also published high-impact technical papers on similar topics such as in the *Flood Risk Management Journal*.

**Shariffah Rafidah Wan Alwi** is a Professor in the School of Chemical and Energy Engineering, UTM. She previously helmed as the Director of Process Systems Engineering Centre for 10 years (2011–2021). She is an Expert Pinch Consultant for multiple industries and is among the leading researchers in Pinch Analysis technique development. She is also the Co-founder and Director of Optimal Systems Engineering Sdn Bhd, a UTM Spin-off company. She is an active consultant as well as trainers for the industries. She has won various international and national awards such as Green Talents 2009 (Germany), IChemE Highly

Commended Sir Frederick Warner Prize 2011 (UK), ASEAN Young Scientist and Technologist Award 2014, National Young Scientist Award 2015, ASEAN-US Science Prize for Women 2016 in Energy Sustainability, Malaysia Research Star Award 2016, 2018, 2019, and Top Research Scientists Malaysia 2018. She was listed as 'Asian Scientist 100' in 2017 and 'Asia's Rising Scientists' in 2020, and '8 Women Scientists from Asia You Should Know' in 2021 by AsianScientist.com.

**Eeydzah Aminudin** is a Senior Lecturer in the Department of Structure and Materials, UTM. Currently, she is the Co-ordinator for Master Programme in Construction Management, UTM. She completed a Bachelor and Doctor of Philosophy in Civil Engineering from UTM, which is among the ASEAN top 10 universities based on QS university ranking released in 2017. She was attached in her 4th year of teaching in UTM which previously she started her career in Universiti Tun Hussein Onn (UTHM), Batu Pahat, for almost a year. Her enthusiasm in research and education has brought her up to date more than 20 publications published while involving herself in multidisciplinary research projects, which part of it is the government initiatives projects with different fields since 2010. She has developed several award-winning research products and services that have been patented trademarked in the Malaysian construction industry.

**Ferian Anggara** is a Senior Lecturer at Universitas Gadjah Mada, Indonesia. His research is mainly focussed on coal, geology, and rare earth element.

**Hamizah Liyana Binti Tajul Ariffin** is currently an Academic Programme Co-ordinator for Masters of Science in Construction Contract Management and also a Senior Lecturer at the Department of Quantity Surveying, Faculty of Built Environment and Surveying. She obtained her Doctorate degree from the University of Salford, United Kingdom, and also part of Building Information Modelling Research Group in UTM and a Certified Trainer for Designer's Competency Training under Occupational Safety and Health for Construction Industry Management (OSHCIM). Her main research interests include, but not limited to, construction contract management, building information modelling (BIM), safety in construction, and dispute resolution in the construction industry.

**Zwe Man Aung** graduated from the Faculty of Civil Engineering, Yangon Technological University, Myanmar, and currently is a Master student in the Department of Construction Engineering and Management, Faculty of Civil Engineering, Ho Chi Minh City University of Technology, Vietnam National University, Ho Chi Minh City, Vietnam. His areas of research are construction risk management and claim management. He is also awarded with a scholarship for the master study in collaborative education programme (CEP) at Ho Chi Minh City University of Technology financed by Japan International Cooperation Agency (JICA) Project for ASEAN University Network/Southeast Asia Engineering Education Development Network (JICA Project for AUN/SEED-Net).

**Norazura Mizal Azzmi**, Department of Built Environment Studies & Technology, Faculty of Architecture, Planning And Surveying, Universiti Teknologi Mara Perak. She obtained her Master of Science in Building Technology from the School of Housing, Building and Planning, Universiti Sains Malaysia. She received her first degree in Bachelor of Science in Housing, Building and Planning majoring in Building Technology also from the same university. She joined the Centre of Studies for Building Surveying, Faculty of Architecture, Planning and Surveying, Universiti Teknologi Mara Perak, as a Permanent Lecturer in 2007 and Senior Lecturer since 2017. She is currently pursuing her PhD degree in Environmental Technology and Materials from UTM and has published papers in Journal and Indexed Proceedings locally and internationally. She has served as an Academician and also Residence Staff in Indera Mulia College, UiTM, to contribute to students' development.

**Nur Fatin Syazwani Abu Bakar** Postgraduate Candidate, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia. She graduated from International Islamic University Malaysia and UTM. Possessing strong operations skill in value engineering, contract management, cost management, and project estimation via AutoCAD, SAP Ariba, Revit, CubiCost, and Icore payment system. She is a recipient of two Gold Medals, one Special Award, and one Silver Medal from innovation competitions in Korea, Taiwan, and Canada, where her research products have been copyrighted by the Intellectual Property Corporation Malaysia (MyIPO). With 11 years of working experience in mega construction projects, she was invited as an Industrial Speaker by UTM. She is a Registered Provisional Quantity Surveyor with the Board of Quantity Surveyors Malaysia and a Professional Technologist (Ts) with the Malaysia Board of Technologists (MBOT).

**Denver Banlasan** is currently pursuing his Master's degree in Construction Management at Ho Chi Minh City University of Technology, Vietnam National University, Ho Chi Minh City. His research interests include application of machine learning, data mining, and natural language processing techniques in construction and infrastructure management.

**Leng Pau Chung (P.C.)** received his PhD degree in Architecture from the UTM, Skudai Johor Malaysia. He is currently a Senior Lecturer for the Architecture Programme at The Faculty of Built Environment and Surveying, UTM. His research interests lie in the sustainable architecture in passive cooling design, sustainable housing design, industrialised building system (IBS) design, education in building information system (BIM), as well as sustainable planning and design. His interests are in sustainable built environment development and its impact on the natural environment. Also, he is currently the Principle Investigator for Research University Grant (Tier II) entitled 'Optimization of Natural Ventilation with Solar Chimney For Single Storey Terraced House in Tropical Climate and National Real Estate' and Research Coordinator Grant (NAPREC) entitled



‘Challenges in Adopting Open Industrialized Building System (IBS) in the Malaysian Affordable Housing Construction Industry’.

**Mohd Fadhil Md Din**, Centre for Environmental Sustainability and Water Security (IPASA), School of Civil Engineering, Faculty of Engineering, UTM. Prof Ir Dr Mohd Fadhil is currently working as an Academic Administration serving as Sustainable Action Plan on the campus and is passionate about creating research and diplomatic communities in the sustainability framework. He is also one of the professional engineers in practice from the Institute of Engineer Malaysia (IEM) and the Board of Engineer Malaysia (BEM) related to water and environmental engineering. He has been involved in national and international researches related to biotechnology, water, and wastewater technology and environmental science and application. He received a great honour from the Academy Science of Malaysia (ASM) as the Associate Fellow since 2018. He also actively participates in the networking of Malaysia Sustainability University Network (MySUN) to motivate himself in the direction of sustainability in the future.

**Ainarull Assikin Abdul Hadi**, is one of the directors in the G7 contractor company in Malaysia. She graduated with a Master’s in Business Administration (Strategic Management) from Azman Hashim International Business School, Universiti Teknologi Malaysia. She pursues her Phd at Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, Kuala Lumpur in the area of project management, specifically on the affordable high-rise public housing projects. With more than 10 years working experience in project management, value engineering, and contract management, she has been invited as an industry speaker for postgraduate programmes by Universiti Teknologi Malaysia. She is registered with Board of Engineer Malaysia (BEM) and The Institution of Engineers, Malaysia (IEM) and also a Professional Technologist (Ts) with Malaysia Board of Technologist (MBOT).

**Mohammed Hail Hakimi** is a Senior Lecturer of Geology Department, Faculty of Applied Science, Taiz University, 6803 Taiz, Yemen. His research interests are unconventional energy resources, shales, geochemistry, and petrography organic.

**Razali Adul Hamid** is currently an Acting Dean, Faculty of Built Environment and Surveying, UTM. Research Expertise: Construction Project Management, Innovative Construction, and Project Sustainability Management. He is a Member of the Royal Institution of Chartered Surveyors UK, a Member of the Royal Institution of Surveyors Malaysia, and a Member of the Board of Quantity Surveyors Malaysia.

**Siti Zubaidah Binti Hashim**, Centre of Studies for Building Surveying, Department of Built Environment Studies & Technology, Faculty of Architecture Planning and Surveying, Universiti Teknologi Mara, Perak Malaysia. She is a Senior Lecturer in Universiti Teknologi MARA, Perak Branch. She was a Project Leader for Research Acculturation Grant Scheme (RAGS) under

Malaysia Greater Research Network System (MyGRANTS), Ministry of Higher Education. The grant was awarded to run research on green building incentives. She is also appointed as a green building evaluator by Melaka Green Technology for green building assessment inspection. Most of the research papers that she has published were on similar topics.

**Izni Syahrizal Bin Ibrahim** is an Associate Professor at the School of Civil Engineering, UTM. He received his PhD degree from the University of Nottingham, United Kingdom, in 2008. He is currently a Director at Forensic Engineering Centre (FEC), Institute for Smart Infrastructure and Innovative Construction (ISIIC) since April 2018. At the same time, he is also the Quality Manager at Civil Engineering Testing Unit (CETU) under the School of Civil Engineering, Faculty of Engineering. CETU is an accredited laboratory for MS ISO/IEC 17025: 2017 SAMM No. 804. His research area/interest is related to precast concrete construction, composite action behaviour in precast structure, steel fibre reinforced concrete, and forensic engineering investigation. He has published more than 100 technical papers in international journals and conference proceedings mainly in Structures and Materials.

**Hamzat Isah**, Hassan Usman Katsina Polytechnic, Katsina State Nigeria, A Registered Builder with the Council of Registered Builders of Nigeria and MSc Graduate (Building) from the Universiti Sains Malaysia, He is currently a Lecturer with Hassan Usman Katsina Polytechnic . His research interest is in the area of health and occupational safety.

**Herda Balqis Binti Ismail** is a Senior Lecturer at the School of Civil Engineering, College of Engineering, Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang. Her main research interests include construction waste management, construction management, and occupational, safety, and health in construction. Currently, her research is focussed on design for safety in the construction industry.

**Syuhaida Ismail**, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, Kuala Lumpur. She is an Associate Professor of Project Management at Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, Kuala Lumpur. She has published more than 300 technical papers, articles and books on Project Management, and recently on the COVID-19 crisis in built environment. She has received more than 50 research and professional awards, where her research products are commercialised into more than 100 Intellectual Property Rights.

**Istimaroh**, Faculty of Business and Management, Universitas Muhammadiyah Kalimantan Timur, Faculty of Business and Management, Universiti Tun Hussein Onn Malaysia. She graduated from the Faculty of Business and Management, Universitas Airlangga, Surabaya, Indonesia, and currently is a PhD by research student. Her study focusses on supply chain management, which includes the

usage of operation management. This paper is the first that regarding supply chain management with the titled 'The Key Practices of Lean Supply Chain Management: A Review' will be published in the RCCE International Conference on sustainable 2020, UTM.

**Nazhatulzalkis Jamaludin**, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Perak Branch. She is a Lecturer in Universiti Teknologi MARA Perak Branch under Department of Built Environment Studies & Technology. She has 15 years working experience as a Lecturer and 5 years in the construction industry. Her research interests are in Environmental Studies and Building Technology. She has also published technical papers on similar topics both local and abroad.

**Noor Azreena Kamaluddin**, PhD, School of Civil Engineering, College of Engineering, Universiti Teknologi MARA. She is a Senior Lecturer and Researcher at Universiti Teknologi MARA, Malaysia. She is actively involved in teaching, researching, and consultation activities. Teaching activities include lecturing, tutoring, and supervising students' theses. The main areas of research are road safety, traffic, and highway engineering. Her current research focusses on traffic safety particularly involving vulnerable road users and has led several research grants along her career. Her research concerns all aspects of safety for vulnerable road users as well as innovative methods and tools for data collection and behaviour analysis as well as safety assessments techniques. She is part of the team in developing the safety module for the p-hailing riders in Malaysia

**Adetunji Kamoli** is a PhD Research student in the Department of Quantity Surveying, Faculty of Built Environment and Surveying, UTM. Currently, he is researching on occupational health and safety management system in the construction industry. He had presented papers in the field of occupational health and safety at international conferences and also published papers in international journals. He is a Member of the Nigerian Institute of Quantity Surveyors (NIQS) and a registered Quantity Surveyor with the Quantity Surveyors Registration Board of Nigeria.

**Santhana Krishnan**, PhD, Centre for Environmental Sustainability and Water Security (IPASA), School of Civil Engineering, Faculty of Engineering, UTM. He is a Post-Doctoral Researcher (Biochemical Engineering) at the Centre for Environmental Sustainability and Water Security (IPASA), UTM. His main areas of research are Bioenergy, Fermentation, Water treatment, Bioelectrochemical systems, Nanomaterial synthesis for energy and water applications and Bioreactors development. He has been involved in national and international research and industrial projects. He has published more than 50 papers in prominent journals in Elsevier's, Springer, Wiley, and has authored 5 book chapters. His works have been cited 610 times with an h index of 14 and an i10 index of 15 to date. He has been a reviewer for various journals published by Elsevier, Wiley, RSC, and Springer.

**Christine Nerisha Anak Stephen Liat**, School of Civil Engineering, Faculty of Engineering, UTM. Miss Christine Nerisha Anak Stephen Liat graduated from the Faculty of Civil Engineering, UTM, Johor, Malaysia, and currently, is a Master's research student. Her study focusses on carbon tax impact in the construction industry, which includes the impact modelling and creation of green technology.

**Eric Lou** is a Reader in the Manchester Metropolitan University. His research investigates sustainability-led design for buildings with a specific interest in refurbishment, retrofit, and restoration of existing buildings. His expertise is in the areas of embodied energy and carbon management of materials. His interest lies in the interoperability of data for the built environment. He explores technological advancements of big data, advanced imaging, and BIM – all to create computing intelligence for the built environment.

**Syamsul Hendra Bin Mahmud** is a Senior Lecturer in the Department of Quantity Surveying, Faculty of Built Environment and Surveying, UTM. Research Expertise: Construction Safety Management, Construction Technology & Innovation, Cost Engineering & Quantity Surveying.

**Zainuddin Abd Manan** is a Professor of Chemical Engineering, the Founding Director of UTM Process Systems Engineering Centre (PROSPECT), Founding Dean of UTM Faculty of Chemical and Energy Engineering, the Founder of the UTM spin-off, Optimal Systems Engineering. He began his career as an Engineer in PETRONAS and Hume Industries and has been an academic leader, professor, researcher, consultant, and professional coach for over 25 years. As a researcher and professional practitioner, he has completed over 100 R&D and consultancy projects, has numerous patents and more than 500 publications that include 30 books/chapters, 220 refereed journals and 270 conference papers on sustainable engineering of resources (energy, power, water, emissions, and materials). He is a professional engineer, a chartered engineer, a certified energy manager, a registered electrical energy manager and the certified lead trainer for Malaysia energy managers. He has delivered over 400 invited talks in professional courses, conferences, and seminars across the world, including the 2014 Imperial College Distinguished Chemical Engineering Lecture. He has coached professionals from more than 500 national and multi-national companies.

**Taslim Maulana** received a Bachelor's degree (2016) in Geology from Universitas Gadjah Mada, Indonesia. His research is mainly focused on coal, geology, and petrophysics of coal.

**Dianah Mazlan**, School of Civil Engineering, Faculty of Engineering, UTM. She received her BEng, MEng and PhD in Civil Engineering at UTM. She actively involved in national and international research and consultancies project-related sustainable concrete/cement materials, fibre-reinforced concrete, wood/cellulose materials in cement composites, construction waste management, waste to

wealth, green energy & zero energy building and sustainable development goals. Currently, she is a Research Officer in UTM Campus Sustainability, who in charge in an international project sponsored by European Commission under ERASMUS+ grant. The project is regarding Malaysia Sustainable University Network.

**Masria Mustafa**, School of Civil Engineering, College of Engineering, Universiti Teknologi MARA. Dr –Ing Masria Mustafa, is presently an Associate Professor at Universiti Teknologi MARA. She earned a Bachelor's degree in Civil Engineering from Universiti Sains Malaysia, Malaysia, a Master's degree from Chulalongkorn University, Thailand, and a Doctorate from Technical University of Munich, Germany. Her main areas of interests are traffic simulation and modelling, traffic operation and control, road safety, intelligent transport system (ITS) and advancement of women in transportation. To date, she has published various documents of international journals and proceedings, conferences, and chapter in book

**Siti Nur Syamimi Binti Mohd Na'im**, Department of Environmental Engineering, School of Civil Engineering, Faculty of Engineering, UTM. Mrs Siti Nur Syamimi graduated from the Faculty of Environmental Studies, Universiti Putra Malaysia, Selangor, Malaysia and currently, is a Master by research student in the School of Civil Engineering, Faculty of Engineering, UTM, Johor, Malaysia. Her study focusses on solid waste management; emphasis on recycling management which includes the application of waste and recycling policies towards a sustainable environment.

**Najib** is a Senior Lecturer at the Geological Engineering Department, Engineering Faculty, Universitas Diponegoro, Indonesia. His current interests are slope engineering, geotechnical applications, rock mechanics and tunnel engineering.

**Nurul Nazleatul Najiha Binti Mohd Nazif**, School of Civil Engineering, Faculty of Engineering, UTM. She graduated BAsC in Sustainable Science at Universiti Malaysia Kelantan (UMK) and MEg in Civil Engineering (Environmental Management) at UTM. She is currently studying for her PHD (Environmental Engineering) in UTM. Her study focusses on the Fluorocarbon gas management in Malaysia. During her study, she has been actively involved in national and international research and consultancies projects related environmental management, waste to wealth, climate change, module development, and awareness programme. Recent year, she is working on Fluorocarbon gas management that awarded from the Ministries of Environment Japan (MOEJ) and United Nations Environment Programme (UNEP).

**Norehan Norlida Mohd Noor** graduated from Universiti Sains Malaysia, Penang, in Bachelor of Science (Hons) In Housing, Building and Planning majoring in Quantity Surveying, and furthered her study in Master of Science in Project Management at the same university. She received a Doctor of Philosophy in Built Environment 'Building Maintenance Budget Determination' at Universiti

Teknologi Mara, Shah Alam, Selangor. Currently, she is a Senior Lecturer who serves at Centre of Studies for Building Surveying, Department of Built Environment Studies & Technology, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Perak Branch. She teaches the undergraduate programme, in building economics, and construction costs for 18 years since 2003. At the same time, she also contributes and shares her experience as the supervisor to master students. She was in the construction industry for 12 years and is experienced in leading various construction projects around Peninsular Malaysia. She is an avid researcher and writer. She received the Excellent Employee Award twice, in 2012 and 2019.

**Norasmiha Binti Mhd Nor**, PhD, Department for Faculty of Business and Management, Universiti Tun Hussein Onn Malaysia. She is a Lecturer and a researcher of the Centre for Operations Management, Universiti Tun Hussein Onn Malaysia. She has been involved in national and international research related to operations management.

**Steven Kuba Nuhu**, is a Lecturer with the Department of Minerals and Petroleum Resources Engineering, School of Engineering, Plateau State Polytechnic, Barkin-Ladi, Jos, Nigeria. He was graduated from the Federal University of Technology, Minna, Nigeria with a Master's degree in Chemical Engineering. Currently, he is a PhD student with the school of Chemical and Energy Engineering, Faculty of Engineering, UTM, Johor Bahru, Malaysia. His study focusses on Process Integration and Renewable Energy, which includes the design of hybrid multi-criteria decision-making (MCDM) methods that can be integrated with the geographic information system (GIS) for the modelling of both greenfield and brownfield eco-industrial park (EIP) site selection. The first paper was the 'Roles of Geospatial Technology in Eco-Industrial Park Site Selection: A State-of-the-art Review' published in the *Journal of Cleaner Production*. He has also co-authored a chapter "Development and Design of Eco-Industrial Park Toward Circular Economy" in the book *Process Design and Optimisation Towards Circular Economy* which is in press.

**Afikah Binti Rahim** is a Senior Lecturer at the Department of Geotechnics and Transportation, School of Civil Engineering, UTM. Her current interests are geology, rock mechanics, coal, enhanced coalbed methane, sorption CO<sub>2</sub>, reservoir modelling.

**Mohd Fairuz Bin Ab Rahman** graduated from the University of Sheffield, UK, in BEng Mechanical Engineering, UiTM in MSc Integrated Construction Project Management and the RMIT University, Australia, in PhD Mechanical Engineering. He is registered with the Board of Engineers Malaysia as a Professional Engineer with Practising Certificate and Malaysia Board of Technologists as a Professional Technologist. He has worked with the Department of Occupational Safety and Health (DOSH/JKKP) since 2003. He has published more than 20 articles in the field of accident analysis and construction safety and health.

**Nur Anis Bt Abdul Rahman** is a degree holder in Building Surveying from Universiti Teknologi MARA. She is currently working as a Building Surveyor in the private sector in Kuala Lumpur. Her working experience is mainly in Facilities Management and Project Management.

**Zanariah Abd. Rahman**, School of Civil Engineering, College of Engineering, Universiti Teknologi MARA. She is a Senior Lecturer, a Professional Technologist and a Researcher at Universiti Teknologi MARA (UiTM), Malaysia. She is also a member of Transportation Systems, Infrastructure and Intelligent Transport (TRANSIIT) Research Interest Group at UiTM. Her works includes teaching, researches and consultation with her main research interest are in highway design and maintenance, urban transport system, pedestrian behaviour and sustainable mobility. She has led several research grants and accomplished several innovation awards with her works throughout her career in UiTM.

**Muhammad Wafiy Adli Bin Ramli**, School of Civil Engineering, Faculty of Engineering, UTM. He graduated with a Bachelor of Geoinformatics degree and a Master's degree in Environmental Management from UTM. Currently, he is pursuing his PhD degree which focusses on the development of an integrated disaster risk assessment in Malaysia. He has published several publications in disaster management and GIS such as Disaster Risk Index: A Review of Local Scale Concept and Methodologies.

**Nur Izzati Ab Rani**, School of Civil Engineering, College of Engineering, Universiti Teknologi MARA. She is a Senior Lecturer at Faculty of Civil Engineering, Universiti Teknologi Malaysia, Kuala Lumpur. She has been teaching Construction Business and Project Management related subjects. Her research area is in international construction business, project management and sustainable development, where she has published several research paper in local and international conferences and seminars. She has experience in undertaking various project management research as the member, namely related to the Coronavirus Disease 2019 (COVID-19) pandemic, constructions projects and also maritime industry.

**Mohd Nadzri Md Reba** is currently the Director of Geoscience and Digital Earth Centre (INSTeG) and a Senior Lecturer at Faculty of Built Environment and Surveying in UTM. As a Member of IEEE, SPIE, ISPRS, and AARS, his interest in signal processing of laser radar, remote sensing and atmospheric science has led him to publish number of ISI-cited journals and international proceedings. He has involved in national and international research and consultation in satellite oceanography, weather radar, satellite glacier mapping, multispectral UAV, high-resolution aerosol mapping, microwave lidar and tropical cyclone.

**Mior Alhadi Mior Ahmad Ridzuan**, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Perak Branch. He was an undergraduate student of building surveying programme, Universiti Teknologi MARA Perak Branch. Now he works in Technical Department in Sitiawan Properties.

**Fatin Nabihah Syahira Ridzuan**, Faculty of Built Environment and Surveying, UTM. Mrs Fatin Nabihah Syahira Binti Ridzuan graduated from the Faculty of Geoinformation and Real Estate, UTM, Johor, Malaysia and currently is a Master by research student. Her study focusses on estimation of Chl-a and nutrients concentration including the development of standard ocean colour algorithms and machine learning models. The first paper regarding Chl-a estimation is titled ‘Spatial variability assessment on the high-resolution Chlorophyll-a extraction from Landsat 8 imageries in Johor waters’ has been published in a *Journal of Engineering Technology and Applied Physics*.

**Nurfarhain Binti Mohammed Rusli** obtained her BEng and MEng (Civil Engineering – Environmental Management). At present, she is a Research Officer in Centre of Lipids Engineering and Applied Research (CLEAR), UTM and is on-going her PhD (Environmental Engineering) in UTM. She has been involved in national and international research and consultancies projects related to water security, environmental management, and climate change. She joined international project related to energy efficiency and climate change includes under the JICA Programme, Japan, and industries from Japan, and the Erasmus Project from European Commission related to sustainability. Currently, she is working on climate change project under UNEP and she has published high-impact technical papers on similar topics such as in the *Cleaner Production Journal*.

**Fadzlin Binti Md Sairan**, PhD, Ibnu Sina Institute for Scientific and Industrial Research, UTM, Malaysia. She is a Senior Research Officer at Ibnu Sina Institute for Scientific and Industrial Research, UTM. She has been involved in several research and consultancy projects, funded by various agencies, including a grant from European Commission on water sustainability. She has almost eight years of experience in developing software for wastewater treatment plant design, air pollution, chemical risk assessment; landfill design; applied various environmental engineering simulation software, e.g., ASIM (Activated Sludge SIMulation Programme) and has written more than 30 articles in refereed journals and international conference proceedings.

**Noor Nabilah Binti Sarbini** is a Senior Lecturer at the School of Civil Engineering, UTM. She received her PhD (Civil Engineering) in 2014 from UTM. She is also a Registered Professional Engineer who has a wide experience in structural assessment and failure investigation. Her major interests include building assessment, forensic engineering, bridge engineering and occupational, safety and health in the construction industry.

**Noor Aslinda Binti Abu Seman**, PhD, Centre for Faculty of Business and Management, Universiti Tun Hussein Onn Malaysia. She is a Lecturer and a Research Fellow of the Centre for Supply Chain Management, Universiti Tun Hussein Onn Malaysia. She has been involved in national and international research related to Green supply chain management.



**Bambang Setiaji**, Department for Faculty of Business and Management, Universitas Muhammadiyah Kalimantan Timur. Prof Dr Bambang Setiaji is a Leader and Lecturer of the Department of Business and Management, Universitas Muhammadiyah Kalimantan Timur. He has been involved in national and international research related to development of economic and management. He has been also hoined a Short Course (Labor Economics and Development Economic) in Monash University Australia.

**Siti Mazzuana Shamsuddin** was born in Kuala Lumpur, Malaysia in 1980. She received Bachelor in Quantity Surveying in 2002, Masters in Science in Construction Management in 2005 and Doctor of Philosophy in Civil Engineering from UTM, Skudai, Johor, Malaysia, in 2020. She has six years of working experience before joining Universiti Teknologi MARA as a Lecturer and Senior Lecturer since 2013 in Centre of Studies in Quantity Surveying, Faculty of Achitecture Planning and Surveying, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia. She has published 18 publications and her research interests are life cycle costing, construction innovation, and sustainable development.

**Takeru Shibayama**, PhD, Institute of Transportation, TU Wien. He is currently a Senior Scientist at the Research Center of Transport Planning and Traffic Engineering at TU Wien, Austria. His research focusses on travel behaviour, public transport, and shared mobility, he has led a number of research projects related to organisation and policy of public transport as well as shared mobility, publishing a number of scientific papers. He led the worldwide questionnaire-based survey on COVID-19 and mobility in March–June 2020 at TU Wien. Currently, he is a Co-chair of WCTR Special Interest Group G2 National and Regional Transport Policy and Planning.

**Do Tien Sy** currently works at the Department of Construction Engineering and Management a Lecturer at Faculty of Civil Engineering, Ho Chi Minh City University of Technology, Vietnam National University, Ho Chi Minh City, Vietnam. He has been involved in national and international research and consultancies projects related to contract management, risk management, claim management, dispute resolution, and building information modelling (BIM). He has been participated in teaching and research in many programmes of the AUN/Seed-net organisation.

**Shazwin Binti Mat Taib**, PhD, Department of Environmental Engineering, School of Civil Engineering, Faculty of Engineering, UTM. She is a Senior Lecturer and a Research Fellow of the Centre for Environmental Sustainability and Water Security (IPASA), UTM. She has been involved in national and international research and consultancies projects related to climate change and water, solid waste management as well as sustainability management. International scientist related to climate change includes under the JICA and the UNEP, France. She has published 49 papers in prominent journals in Web of Science, Scopus, and has authored 6 book chapters. She is actively involved in international networking

including concluding MoUs with Viet Nam National University Ho Chi Minh and National Institute of Technology, Kagoshima College as well as MoAs with Mitsubishi UFJ Morgan Stanley and E & E Solutions Inc. Japan.

**Putri Basenda Tarigan**, Graduate Student, Faculty of Civil Engineering, Ho Chi Minh City University of Technology – Vietnam National University. Ms Putri Basenda Tarigan graduated from Civil Engineering department in Andalas University in Indonesia. Her basic is in Structure Engineering. She was awarded CEP Scholarship to continue Master's degree with a full scholarship from AUN/SEED-Net, under the JICA programme. Currently, she is a Graduate student of Construction Management Department in Ho Chi Minh City University of Technology. She did her research that focus on optimisation of construction project. Along with her study, she has published her research in a well-known international journal.

**Gabriel Ling Hoh Teck** is a Senior Lecturer in the Faculty of Built Environment and Surveying of UTM. His research mainly focusses on inland and urban planning laws and public policies (governance) study, resource governance and management, new institutional economics (ecological economics), land and urban economics, climate changes and cities, common and public goods studies, property management and development process, social-ecological system framework, behavioural study, behavioural economics in real-estate valuation and management, game theory, research methodology, institutional analysis development (IAD), low-carbon society study, housing studies, social dilemmas, self-organising, and collective action theories.

**Duc-Hoc Tran**, PhD, Faculty of Civil Engineering, Ho Chi Minh City University of Technology – Vietnam National University. He graduated from the Department of Civil and Construction Engineering in National Taiwan University of Science and Technology in 2015. His field is focussed on automation and optimisation of construction project. He has published a lot of research in this field in many popular international journals. He just recently nominated and appointed as an Associate Professor in Ho Chi Minh University of Technology. His current profession is as a Lecturer in Construction Management Department in Ho Chi Minh City University of Technology.

**Norhidayah Md Ulang** holds degrees, BSc and MSc in Building Technology, School of Housing, Building and Planning, University Sains Malaysia, Malaysia, as well as PhD (Built Environment) from Civil and Building Engineering Department, Loughborough University, United Kingdom. She joined UiTM for a short period as a Lecturer in Building Surveying Department before pursuing her PhD. She joined Universiti Sains Malaysia in 2012 and currently attach to Building Engineering Technology Department in School of Housing, Building, and Planning. Her research interest is in the field of construction development process, building maintenance, construction health and safety, and energy efficiency.

**Nguyen Thanh Viet** received his PhD in Construction Engineering and Management from Pukyong National University (PKNU), Busan, South Korea, 2016. Currently, he is a Lecturer at the Faculty of Civil Engineering, Industrial University of Ho Chi Minh City, Ho Chi Minh City, Vietnam. His research interest includes Value Engineering in Construction, Construction Supply Chain Management, and Risk Management in Construction.

**Omar Sedeeq Yousif**, School of Civil Engineering, Faculty of Engineering, UTM. He graduated from the Department of Civil Engineering, University of Mosul, and obtained his Master of Engineering in Construction Management from UTM, Johor, Malaysia, and currently is a PhD candidate at the same Faculty in UTM. His research focusses on construction management, construction informatics, and sustainable initiatives. He has also published high-impact technical papers on similar topics such as in the green highway initiatives and management journals.

**Zulkifli Bin Yusop**, Centre for Environmental Sustainability and Water Security (IPASA), School of Civil Engineering, Faculty of Engineering, UTM. Prof Dr Zulkifli Yusop is a Senior Professor and a Senior Fellow of the Centre for Environmental Sustainability and Water Security (IPASA), UTM. His research interests include water management, climate change impact on water resources, non-point source pollution, and integrated river basin management. He has authored and co-authored about 400 articles, of which 105 are indexed in ISI, 50 in Scopus, 30 book chapters, 8 books, and the rest are proceedings. He is currently working on a RM 7.8 million research grant from the UK Research Institute (UKRI) on water security together with other collaborators from UK, India, Ethiopia, and Columbia.

**Hareyani Zabidi** is a Senior Lecturer at School of Material and Mineral Resources, Engineering Campus, Universiti Sains Malaysia. Her current interests are karst, rock mechanics, tunnel modelling, and mineral resources.

**Intan Bayani Bin Zakaria**, Centre of studies for Building Surveying, Department of Built Environment Studies & Technology, Faculty of Architecture Planning and Surveying, Universiti Teknologi Mara, Perak Malaysia. She is a Senior Lecturer in University Teknologi MARA Perak Branch and currently doing her PhD at Universiti Malaya, Malaysia. Her research is on the indoor air pollution for non-landed kindergarten building. She has 11 years working experience as a lecturer. In addition, she was also involved in higher education programmes such as syllabus review, accreditation process, student internship, and student's final project supervision. She has also published papers on similar topics local and abroad journal.

**Rozana Zakaria** currently serves as an Associate Professor and Head of Research Group, GreenPROMPT at School of Civil Engineering, Faculty of Engineering, UTM. Her expertise is highly concentrated on construction and

project management with specialization in sustainable construction, sustainable building, and infrastructure, which respond highly to sustainable urban development.

**Rosli Bin Mohamad Zin** currently served as an Associates Chair of Quality and Strategy for School of Civil Engineering, Faculty of Engineering, UTM. His research areas are construction management, constructability, and green construction.



# PREFACE

This book intends to share research works in the field of current niche area in sustainability management, beyond modern strategies and showcasing impact in developing countries. The work is a collection of various impactful research works presented during the Regional Conference of Civil Engineering and Sustainable Development Goals 2020 (RCCE & SDGs 2020), which held from 7 to 9 November 2021, co-organised together with UTM, MySUN, and AUN/SEED-Net, Japan. Contributing authors are from Malaysia, Vietnam, and Nigeria, whose research covers a range of sustainable management fields, from construction management, covid-19 impact to socio-economics, green initiatives, engineering, to framework and policies.

The importance of sustainability strategies and identification of impacts in developing countries is a vital element in physical and/or social development. The content of this book is concurrent to the SDGs awareness to provide information to the public, researchers, planners, and stakeholders dealing implicit and explicitly to sustainable development. A huge gratitude to all contributors involved in the production of this book.