
50 YEARS OF LEADING KNOWLEDGE FOR CHANGE
WE LEAD
ICSDG2019
Achieving SDGs: Rising to the Challenge
2ND
30-31 JULY 2019 | OLIVE TREE HOTEL, PENANG
INTERNATIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT GOALS
PROGRAMME & ABSTRACT BOOK

# 2ND INTERNATIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT GOALS

# ICSDG2019

## Achieving SDGs: Rising to the Challenge

30-31 JULY 2019 | OLIVE TREE HOTEL, PENANG

# PROGRAMME & ABSTRACT BOOK

**Prepared by:**
Secretariat,
International Conference on Sustainable Development Goals 2019,
South East Asia Sustainability Network (SEASN),
Universiti Sains Malaysia.

50 YEARS OF LEADING KNOWLEDGE FOR CHANGE

1969-2019

USM

UNIVERSITI SAINS MALAYSIA

WE LEAD

*In conjunction with*

*USM 50th Anniversary*

# Background

The International Conference on Sustainable Development Goals is an international conference that focuses on 17 goals of Sustainable Development Goals (SDGs). The event is introduced to support the implementation of the new agenda of the United Nations (UN) namely; the SDGs. The SDGs were formally adopted on 25th September 2015 and were officially come into force on 1st January 2016 as the new agenda of the UN after the Millennium Development Goals (MDGs). This agenda is a global action that aims to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The SDGs were built on the success of the MDGs and will complete the work begun with the MDGs.

The 1st International Conference on Sustainable Development Goals (ICSDG2016) was held at Universiti Sains Malaysia (USM) on 7 – 9 December 2016. The event was successfully organised by Universiti Sains Malaysia, Centre for Global Sustainability Studies (CGSS) and the South East Asia Sustainability Network (SEASN) with the support from the Ministry of Foreign Affairs Malaysia, Malaysian National Commission for United Nations Educational, Scientific and Cultural Organisation (UNESCO) and Construction Research Institute of Malaysia (CREAM). The conference was aimed to seek strong collaboration and cooperation among all organisations in Southeast Asian nations for achieving the SDGs by focusing on 5 themes of Prosperity, People, Planet, Peace and Partnership (5Ps).

The 2nd International Conference on Sustainable Development Goals (ICSDG2019) is held on 30-31 July 2019 in Penang, Malaysia. The conference is hosted by USM, CGSS, and SEASN in collaboration with the Penang Convention & Exhibition Bureau (PCEB), Anywheel, the Regional Centre of Expertise (RCE) Penang, and several other organisations that support the SDGs.

The theme for ICSDG2019 is set as *"Achieving SDGs: Rising to the Challenge"* with special focus on the three pillars of sustainability namely: -

i) Social
ii) Economy
iii) Environment

## Aims

Consistent with the goals of the ICSDG series, the aims of the 2nd International Conference on Sustainable Development Goals (ICSDG2019) are as follows:

i) To provide a platform for sharing information, experiences, initiatives and best practices in addressing sustainability challenges within the SDG framework among researchers worldwide.
ii) To seek strong collaboration and cooperation among re searchers and organisations in achieving the SDGs.

## Profile of Participants

Delegates attending the 2nd International Conference on Sustainable Development Goals (ICSDG2019) come from a cross-sectoral range of areas including:

i. faculty members
ii. research staff
iii. campus sustainability officers/directors
iv. project officers and consultants
v. student leaders
vi. members of the public interested in sustainability.

It is believed that the wide range of participants will help to better outline the need for integrated approaches towards sustainable development and, hence contribute to the achievement of Sustainable Development Goals 2030.

# Event Structure

The 2nd International Conference on Sustainable Development Goals (ICSDG2019) is consisted of a set of presentations dealing with issues of strategic value in reviewing the state of the art of sustainability today. Each presentation will be 15 minutes, followed by 5 minutes of question-and-answer session which makes up 20 minutes of total presentation period.

# Organising Committee

Conference Patron: Professor Datuk Dr. Asma Ismail, FASc
(Vice-Chancellor, USM & SEASN Chairperson)
Chairman: Dr. Suzyrman Sibly
(Director CGSS, USM & SEASN Secretary-General)
Deputy Chairman: Dr. Mohd Sayuti Hassan
(Deputy Director CGSS, USM)
Secretary: Dr. Ng Theam Foo
Assistant Secretary: Ms. Siti Izaidah Azmi
Treasurer: Ms. Dasyilahanim Mohd Desa
Assistant Treasurer: Ms. Zurina Abdul Hamid
Publication: Dr. Hamoon Khelghat-Doost
Ms. Marlinah Muslim
Sponsorship/Contribution: Dr. Normaliza Abdul Manaf
Dr. Mohd Sayuti Hassan
Publicity/Protocol: Dr. Noor Adelyna Mohammed Akib
Dr. Radieah Mohd Nor
Graphic/Website Design: Ms. Siti Fairuz Mohd Radzi
Venue: Dr. Radieah Mohd Nor
Dr. Normaliza Abdul Manaf
Ms. Siti Izaidah Azmi
Speaker Invitation: Ms. Sharifah Nurlaili Farhana Syed Azhar
Conference Kit: Ms. Ainul Huda Ayu Anuar Aziz
Technical/Logistic: Mr. Mohd Abdul Muin Md Akil
Mr. Mohammad Rafiq Khamaruddin

# Location & Schedule

The 2nd International Conference on Sustainable Development Goals (ICSDG2019) is held from 30th to 31th July 2019 at Olive Tree Hotel, Penang, Malaysia. Parallel sessions will be held at Grand Ballroom (Level 7), Olive 4-5 (Level 6), and Olive 7-8 (Level 6).

| 30/07/19 (TUESDAY) – DAY 1<br>GRAND BALLROOM (LEVEL 7) | |
|---|---|
| 8.00 AM | Arrival & Registration Of Participants |
| 8.30 AM | Arrival Of The Honourable Guests |
| 8.50 AM | National Anthem: "NEGARAKU", USM Anthem: "MENARA ILMU", USM Transformation Video, DU'A Recitation |
| 9.00 AM | Welcoming Speech By Dr. Suzyrman Sibly<br>ICSDG2019 Chairperson & SEASN Secretary General. |
| 9.15 AM | Officiating Speech & Launching of SEASN Compendium<br>By The Honourable Professor Datuk Dr. Asma Ismail, FASc, Vice-Chancellor of USM & SEASN Chairperson. |
| 9.45 AM | Coffee & Tea Break \| Poster Presentation \| Exhibition |
| 10.30 AM | **KEYNOTE**<br>Professor Emeritus Tan Sri Dato' Dzulkifli Abdul Razak<br>Rector, International Islamic University Malaysia (IIUM), Malaysia.<br>Title: "Achieving SDGs: Rising to the Challenge" |
| 11.30 AM | **PLENARY I**<br>Professor Dr. Nor Azazi Zakaria<br>Director of Engineering Campus<br>Universiti Sains Malaysia (USM), Malaysia.<br>Focus Area: "Sustainable Integrated Water Resources Management Toward Practical Solution Addressing Water Issues in Malaysia" |

| | |
|---|---|
| 12.00 PM | **PLENARY II**<br>Professor Dr. Daniel Lang<br>Director of Institute for Ethics and Transdisciplinary Sustainability Research, Leuphana University Luneburg, Germany.<br>Title: "Bridging the Divide Between the Global Sustainability Goals and Their Local Implementation" |
| 12.30 PM | Lunch \| Poster Presentation \| Exhibition |
| 2.00 PM | **PARALLEL SESSION**<br>Session 1A – Grand Ballroom<br>Session 1B – Olive 4-5 (Level 6)<br>Session 1C – Olive 7-8 (Level 6) |
| 3.40 PM | Coffee & Tea Break \| Poster Presentation \| Exhibition |
| 4.00 PM | **PARALLEL SESSION**<br>Session 2A – Grand Ballroom<br>Session 2B – Olive 4-5 (Level 6)<br>Session 2C – Olive 7-8 (Level 6) |
| 8.00 PM | Welcoming Dinner at The Olive |
| **31/07/19 (WEDNESDAY) – DAY 2<br>GRAND BALLROOM (LEVEL 7)** | |
| 8.30 AM | **FORUM: ECONOMIC GROWTH vs SUSTAINABILITY: A MYTH OR REALITY?**<br>MODERATOR: Professor Dr. Azlan Amran<br>Dean, Graduate School of Business,<br>Universiti Sains Malaysia.<br>PANEL 1: Professor Dr. Zinaida Fadeeva<br>Visiting Professor<br>TERI Institute of Advanced Studies & Senior Advisor,<br>UN Office of Resident Coordinator (UNORC), India.<br>PANEL 2: Dr. Muhammed Abdul Khalid<br>Economic Advisor to Malaysian Prime Minister,<br>Prime Minister Office, Malaysia. |

| | |
|---|---|
| 9.30 AM | **PLENARY III**<br>Dr. Myrna P. Quinto<br>Vice-President for Academic Development<br>Far Eastern University (FEU), Philippines.<br>Title: "The Road to Achieving a Sustainable Community Extension Program: The FEU Project HOPE Story" |
| 10.00 AM | Coffee & Tea Break \| Poster Presentation \| Exhibition |
| 10.20 AM | **PLENARY IV**<br>Dr. Claudia Abreu Lopes<br>Research Fellow, United Nations University International Institute for Global Health (UNU-IIGH).<br>Title: "Gender Equality for Sustainable Development: Where Do We Stand?" |
| 10.50 AM | **PARALLEL SESSION**<br>Session 3A – Grand Ballroom<br>Session 3B – Olive 4-5 (Level 6)<br>Session 3C – Olive 7-8 (Level 6) |
| 12.50 PM | Lunch \| Poster Presentation \| Exhibition |
| 2.20 PM | **PARALLEL SESSION**<br>Session 4A – Grand Ballroom<br>Session 4B – Olive 4-5 (Level 6)<br>Session 4C – Olive 7-8 (Level 6) |
| 4.00 PM | **PLENARY V**<br>Assistant Professor Dr. Vorapat Inkarojrit<br>Assistant to the President for Physical Resources and Procurement, Chulalongkorn University (CU), Thailand.<br>Title: "Role of University in Transforming Sustainability" |
| 4.30 PM | **BEST PAPER & PRESENTER AWARDS**<br>**CLOSING CEREMONY** |
| 4.45 PM | Coffee & Tea Break<br>Post-Conference Tour to Setia Spice Convention Centre (A Sustainable Building)<br>End of ICSDG2019 |

# Oral Presentation Schedule

**TUESDAY, 30 JULY 2019 | 2.00-3.40 PM**
**SESSION 1A (GRAND BALLROOM, LEVEL 7)**

**Chairperson: Dr. Myrna P. Quinto**

**2.00-2.20 PM (ICSDG2019-61)**
**SDG 2: Studying a Malaysian Urban Private School.**
**Siow May Ling**
Faculty of Design and Architecture, Universiti Putra Malaysia, Selangor.

**2.20-2.40 PM (ICSDG2019-16)**
**Skills, Spirituality and Strategy: Three Core Competences in Education for Sustainability.**
**Koh Hock Lye**
Jeffrey Sachs Center on Sustainable Development, Sunway University, Bandar Sunway 47500 Selangor, Malaysia.
Jeffrey Cheah Institute on Southeast Asia, Sunway University, Bandar Sunway Selangor, Malaysia.

**2.40-3.00 PM (ICSDG2019-97)**
**Tools for Making the 2030 Agenda One's Issue.**
**Fumiyo Murayama**
Assistant Professor, Department of Environmental Science, Faculty of Life and Environmental Science, Azabu University Sagamihara, Kanagawa, Japan.

**3.00-3.20 PM (ICSDG2019-32)**
**Factors Influencing Sustainable Development In Indonesia's Decentralization Policy.**
**Jayadi**
Institute of Geography, Graduate School of Geosciences, University of Cologne, Germany.

**3.20-3.40 PM (ICSDG2019-98)**
**A Phase Theory for Relevance Between Organization and SDGs.**
**Masaaki Ishii**
Language, Media and Learning Research Center, Kanda University of International Studies, Chiba, Japan.

**TUESDAY, 30 JULY 2019 | 2.00-3.40 PM**
**SESSION 1B (OLIVE 4-5, LEVEL 6)**

**Chairperson: Assistant Professor Dr. Vorapat Inkarojrit**

**2.00-2.20 PM (ICSDG2019-25)**
**Dermestid Beetles as Sustainable Alternative for Bone-Defleshing Method.**
**Fenncy Liz Mike**
School of Health Science, University of Science Malaysia, Malaysia.

**2.20-2.40 PM (ICSDG2019-44)**
**Community Forest Management to Achieve SDGs in Marginal Areas of Bangladesh.**
**Tapan Kumar Nath**
School of Environmental and Geographical Sciences, University of Nottingham Malaysia, Malaysia.

**2.40-3.00 PM (ICSDG2019-99)**
**Nonlinear Dynamic Analysis of Multi-Storey RC Building Models.**
**Syed Muhammad Bilal Haider**
Department of Environmental Engineering, Universiti Tunku Abdul Rahman, Malaysia.

**3.00-3.20 PM (ICSDG2019-58)**
**Analysis of Heavy Metal Concentration in Transplanted Lichen Usnea misaminensis around Kota Kinabalu, Sabah.**
**Azlan Abas**
Centre for Socials, Development and Environmental Studies, Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia, Malaysia.

**3.20-3.40 PM (ICSDG2019-96)**
**Building the Campus Landscape as a Model of Sustainable Cities and Communities.**
**Izyan Ayuni Mohamad Selamat**
Universiti Malaysia Sabah, Malaysia.

**TUESDAY, 30 JULY 2019 | 2.00-3.40 PM**
**SESSION 1C (OLIVE 7-8, LEVEL 6)**

**Chairperson: Dr. Mohd Anuar Arshad**

**2.00-2.20 PM (ICSDG2019-12)**
**A Study on The Metrical and Morphological Effects of Varying Subject-To-Camera Distances (SCDs) In Face Recognition Using Mannequins.**
**Huzzreen Effendy bin Md Ghouse**
School of Health Sciences, Universiti Sains Malaysia, Malaysia.

**2.20-2.40 PM (ICSDG2019-10)**
**The Role of Entrepreneurship Between the Internal Environments and Effectiveness/Alignment of Public Tertiary Institutions in Nigeria.**
**Alhaji Adamu Saidu**
Department of Public Administration
Abubakar Tatari Ali Polytechnic Bauchi State, Nigeria.

**2.40-3.00 PM (ICSDG2019-90)**
**A Comprehensive System Study on Indian Firecracker Industry and Analysing Gaps Affecting Sustainability.**
**Monica Sasikumar**
Department of Design Space,
National Institute of Fashion Technology Hauz Khas,
New Delhi, India.

**3.00-3.20 PM (ICSDG2019-102)**
**The Socio-Economic Impact of SDG Project Executed by the Federal Ministry of Power, Works and Housing from 2016-2018.**
**Babangida Hussaini**
Special Project Unit, Federal Ministry of Power, Works and Housing, Nigeria.

**3.20-3.40 PM (ICSDG2019-129)**
**Labour Migration and Sustainable Development: Asia Pacific Region to Malaysia.**
**Bawani Lelchumanan**
Faculty of Economics and Management,
Universiti Kebangsaan Malaysia, Malaysia.

**TUESDAY, 30 JULY 2019 | 4.00 - 6.00 PM**
**SESSION 2A (GRAND BALLROOM, LEVEL 7)**

**Chairperson: Dr. Hamoon Khelgat-Doost**

**4.00 - 4.20 PM (ICSDG2019-75)**
**Understanding Flight Intentions of Residents in Crime-ridden Neighbourhoods.**
**William Wee-Lim Hew**
Faculty of Business, Multimedia University, Malaysia.

**4.20-4.40 PM (ICSDG2019-83)**
**Smart Urbanism in the SDGs Era: Should Smart Cities Comply with the Politics of Capitalism, Social Democracy, or Ecological Democracy?**
**Sengboon Lim**
School of Social, Development and Environmental Studies, Faculty of Social Science and Humanities, Universiti Kebangsaan Malaysia.

**4.40-5.00 PM (ICSDG2019-68)**
**Connecting Research with SDGs: A Quantitative Overview of Land-use Studies.**
**Chun Sheng Goh**
United Nations University – Insitute for the Advanced Study of Sustainability.
Japan's National Institute for the Environmental Studies, Japan.

**5.00-5.20 PM (ICSDG2019-65)**
**Rising Above and Beyond, A Multi-systemic Approach in Addressing Social ills among Girls from the bottom 40 Community.**
**Barathy Devi Murugaya**
Rythm Foundation QI Social Impact Initiative, Malaysia.

**5.20-5.40 PM (ICSDG2019-84)**
**Distribution and Density of Rastrelliger spp. Larvae in Kedah Waters.**
**Abd Haris Hilmi Ahmad Arshad**
Fisheries Research Institute, Capture Fisheries Research Division, Perak, Malaysia.

**5.40-6.00 PM (ICSDG2019-144)**
**Computer: Solution to Architectural Education Sustainability in Nigeria.**
**Mekwa Eme Mekwa**
School of Housing, Building, and Planning (HBP),
Universiti Sains Malaysia, Malaysia.

**TUESDAY, 30 JULY 2019 | 4.00 - 6.00 PM**
**SESSION 2B (OLIVE 4-5, LEVEL 6)**

**Chairperson: Mr. Muhammad Safiuddin Rosli**

**4.00-4.20 PM (ICSDG2019-103)**
**Integration of Green Infrastructure: A Walkable Campus.**
**Shahida Mohd Sharif**
Faculty of Sustainable Agriculture, Universiti Malaysia Sabah, Malaysia.

**4.20-4.40 PM (ICSDG2019-14)**
**Performance of Hydroponic Growers for Organic Cultivation of *Gynura procumbens*.**
**Muhd Nazrul Hisham Zainal Alam**
School of Chemical and Energy Engineering, Malaysia.

**4.40-5.00PM (ICSDG2019-66)**
**The Willingness to Reduce Plastic Waste from the Restaurant Industry in Bali.**
**Arisman**
Department of Development Economics, Faculty of Economics and Business, UIN Syarif Hidayatullah Jakarta, Indonesia.

**5.00-5.20 PM (ICSDG2019-63)**
**Reproductive Potential of the Indian Squids *Loligo duvaucelii* from Trawl Along Perak Waters.**
**Noor Hanis Abu Halim**
Fisheries Research Institute, Capture Fisheries Division, Perak, Malaysia.

**5.20-5.40 PM (ICSDG2019-54)**
**Environmental Performance Evaluation on Potential Biological Treatment of Food Waste.**
**Sumiani Yusoff**
Institute of Ocean and Earth Sciences, Universiti Malaya, Malaysia.

**5.40-6.00 PM (ICSDG2019-74)**
**Neritic Tuna Fishery and Biological Aspects of *Euthynnus affinis* in Perak.**
**Effarina Mohd Faizal Abdullah**
Fisheries Research Institute, Capture Fisheries Division, Perak, Malaysia.

**TUESDAY, 30 JULY 2019 | 4.00 - 6.00 PM**
**SESSION 2C (OLIVE 7-8, LEVEL 6)**

**Chairperson: Mr. Jay Sharma**

**4.00-4.20 PM (ICSDG2019-114)**
**Achieving SDG 3.8.2: Financial Protection Against Catastrophic Health Expenditure.**
**Surianti Sukeri**
Department of Community Medicine, School of Medical Science, Universiti Sains Malaysia, Malaysia.

**4.20-4.40 PM (ICSDG2019-94)**
**Analysis of Development Expenditure and its Impact on Socio Economic Fevelopment of the Region.**
**Sara Ibtasar**
The Urban Unit, Lahore, Pakistan.

**4.40-5.00 PM (ICSDG2019-140)**
**The Contributions of the Board Of Directors, Gender Diversity and Board Committees on Firm Financial Performance in Nigeria.**
**Aliyu Aminu Baba**
Abubakar Tatari Ali Polytechnic, Bauchi, Nigeria.

**5.00-5.20 PM (ICSDG2019-137)**
**Military Armoured Vehicle Procurement and Its Impact on Employment Creation.**
**Mohd Nor Yahaya**
National Defence University of Malaysia, Kuala Lumpur, Malaysia.

**5.20-5.40 PM (ICSDG2019-91)**
**The J-curve Dynamics and Asymmetric Effect of Exchange Rate Changes on Trade Balance: Evidence from Nigeria.**
**AbdulQadir Idris Abdullahi**
School of Social Sciences, Economics Programme, Universiti Sains Malaysia, Malaysia.

**5.40-6.00 PM (ICSDG2019-049)**
***Mytella charruana*: A new, Invasive Bivalve in Tebrau Strait.**
**Masazurah A Rahim**
Fisheries Research Institute, Penang, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 10.50 AM-12.30 PM**
**SESSION 3A (GRAND BALLROOM, LEVEL 7)**

**Chairperson: Dr. Chan Siok Yee**

**10.50-11.10 AM**
**Sustainable Lifestyle and Zero Carbon Transportation via Active Mobility in Campus.**
**Htay Aung**
Anywheel Pte. Ltd., Singapore.

**11.10-11.30 AM (ICSDG2019-135)**
**Implementation of Project Based Learning Method in Teaching English at MICE Study Program Polteknik Negeri Medan (Polmed-Indonesia).**
**Dra. Ratna Dewi M.Hum.**
Politeknik Negeri Medan, Indonesia.

**11.30-11.50 AM (ICSDG2019-008)**
**Role of Data Mining Models in Environmental Sustainability: Case of Groundwater Exploration Management using Geoscience Derived Parameters.**
**Kehinde Anthony Mogaji**
Department of Applied Geophysics,
Federal University of Technology, Nigeria.

**11.50 AM-12.10 PM (ICSDG2019-59)**
**Riverine Communities Livelihood Strategies in Sadong Jaya, Sarawak, Malaysia.**
**Tan Su Jin**
Faculty of Social Sciences and Humanities,
Universiti Malaysia Sarawak, Malaysia.

**12.10-12.30 PM (ICSDG2019-71)**
**Connecting the Local Communities in Telok Melano, Sarawak.**
**Wong Swee Kiong**
Faculty of Social Sciences and Humanities,
Universiti Malaysia Sarawak, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 10.50 AM-12.30 PM**
**SESSION 3B (OLIVE 4-5, LEVEL 6)**

**Chairperson: Mr. Muhammad Safiuddin Rosli**

**10.50-11.10 AM (ICSDG2019-121)**
**Factors Determining Attitude and Behaviour of Higher Education institution's (HEI's) Community to Practice Reduce, Reuse, and Recycle (3R) in the Campus.**
**Nik Nadia Izyan binti Jamil**
International Institute of Halal Research and Training (INHART), International Islamic University Malaysia, Malaysia.

**11.10-11.30 AM (ICSDG2019-132)**
**Mapping Cultural Ecosystem Services of Taiping Lake Garden.**
**Asyirah Abdul Rahim**
Geography Section, School of Humanities,
Universiti Sains Malaysia, Malaysia.

**11.30-11.50 AM (ICSDG2019-115)**
**Pollutant Source Investigation Affecting Water Quality in Sungai Pinang.**
**Fatehah Mohd Omar**
School of Civil Engineering, Universiti Sains Malaysia,
Malaysia.

**11.50 AM-12.10 PM (ICSDG2019-22)**
**Economic Growth, Energy Consumption and Carbon Emissions in Nigeria: The Implication of Urbanization in Sustainable Development.**
**Busayo Victor Osuntuyi**
Department of Economics, School of Social Sciences,
Universiti Sains Malaysia, Malaysia.

**12.10-12.30 PM (ICSDG2019-111)**
**Measuring the Level of Awareness, Knowledge, and Attitude on Environmental Sustainability Amongst Higher Education Youths in Penang, Malaysia.**
**Fatin Nabilla Ariffin**
Centre for Global Sustainability Studies,
Universiti Sains Malaysia, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 10.50 AM-12.30 PM**
**SESSION 3C (OLIVE 7-8, LEVEL 6)**

**Chairperson: Professor Dr. Munirah Ghazali**

**10.50-11.10 AM (ICSDG2019-142)**
**Carrot and Stick Approach to Influence Value Added Tax (VAT) Compliance Behaviour in Developing Countries.**
**Hannatu Yohanna Gimba**
Department of Accountancy and Taxation
Abubakar Tatari Ali Polytechnic, Bauchi, Nigeria.

**11.10-11.30 AM (ICSDG2019-62)**
***The Vertical Verandah*: Towards a Sustainable Social Space in Multi-storey Residential in Malaysia.**
**Sunil Raj Selvaraj**
Faculty of Innovation and Technology
Taylor's University, Malaysia.

**11.30-11.50 AM (ICSDG2019-120)**
**Petaling Jaya City Council (MBPJ) Assessment Tax Rebate Scheme for House Owners.**
**Anthony Tan Kee Huat**
Petaling Jaya City Council (MBPJ), Malaysia.

**11.50 AM-12.10 PM (ICSDG2019-148)**
**Eco-University Policy and Implementation of Mahidol University, Thailand.**
**Kitikorn Charmondusit and Puttised Tantimekin**
Mahidol University, Thailand.

**12.10-12.30 PM (ICSDG2019-26)**
**University Of Malaya Campus Sustainability Transformation And Transition As Living Lab.**
**Sumiani Yusoff**
Institute of Ocean & Earth Sciences (IOES) and UM Eco-Campus Secretariat & UM Living Labs, University of Malaya, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 2.20-4.00 PM**
**SESSION 4A (GRAND BALLROOM, LEVEL 7)**

**Chairperson: Dr. Hamoon Khelgat-Doost**

**2.20-2.40 PM (ICSDG2019-146)**
**Lessons Learned During Designing In-Service Teacher Training for ESD in Okayama: Formulating Communities of Practice through Collaboration among Multiple Stakeholders.**
**Hiroko Shibakawa**
Assistant Professor, Graduate School of Education,
Okayama University, ESD Promotion Centre, Japan.

**2.40-3.00 PM (ICSDG2019-147)**
**Informal Education as a Strategic University-School Partnership in Enhancing the Quality of Education: Reflections and Lessons Learned.**
**Munirah Ghazali**
RCE ESD Penang @USM; School of Educational Studies,
Universiti Sains Malaysia, Malaysia.

**3.00-3.20 PM (ICSDG2019-69)**
**Communicating Environment Sustainability: Shifting the Perspective from Logic to Emotion.**
**Mahadevan Krishnan**
School of Communication, Universiti Sains Malaysia, Malaysia.

**3.20-3.40 PM (ICSDG2019-136)**
**The Role of Audit on Quality Service Delivery of Tertiary Institutions in Nigeria: A Panacea for Sustainable Development.**
**Ibrahim Abubakar Saddique**
Department of accountancy School of Management Studies
Abubakar Tatari Polytechnic Bauchi State, Nigeria.

**3.40-4.00 PM (ICSDG2019-51)**
**Towards a Malaysian Model of University:**
**IIUM Journey of Humanising Education through Maqasid Shariah and Sustainable Development Goal.**
**Zainal Abidin Sanusi**
Sustainability for Humanity Centre, IIUM, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 2.20-4.00 PM**
**SESSION 4B (OLVE 4-5 LEVEL 6)**

**Chairperson: Dr. Ng Theam Foo**

**2.20-2.40 PM (ICSDG2019-30)**
**Sustainability of Smallholders through Corporate Social Responsibility Programs of Palm Oil Companies: Case Study of Aceh Province, Indonesia.**
**Said Achmad Kabiru Rafiie**
University of Teuku Umar, Meulaboh, West Aceh, Indonesia.

**2.40-3.00 PM (ICSDG2019-113)**
**Life Cycle Assessment and Sustainable Development Goals.**
**Haryati Zainal**
Engineering & Processing Research Division,
Malaysian Palm Oil Board, Malaysia.

**3.00-3.20 PM (ICSDG2019-116)**
**Malaria Prophylaxis: Dissolution Enhancement of Atovaquone by Nanotechnology.**
**Teoh Xin Yi**
School of Pharmaceutical Sciences,
Universiti Sains Malaysia, Malaysia.

**3.20-3.40 PM (ICSDG2019-78)**
**Kanazawa as a Socially-Inclusive Creative City: Lessons for George Town World Heritage Site.**
**Khoo Suet Leng**
Universiti Sains Malaysia, Malaysia.

**3.40-4.00 PM (ICSDG2019-141)**
**Promoting Inclusive Growth Through Effective Apel (C) Mechanism.**
**Mohamad Afzhan Khan Mohamad Khalil**
APEL Centre, Open University Malaysia, Malaysia.

**WEDNESDAY, 31 JULY 2019 | 2.20-4.00 PM**
**SESSION 4C (OLIVE 7-8, LEVEL 6)**

**Chairperson: Mr. Anshuman Singh**

**2.20-2.40 PM (ICSDG2019-60)**
**Stock Assessment Methods of *Decapterus* sp for Sustainable Fishery Management.**
**Noorul Azliana Jamaludin**
Fisheries Research Institute, Capture Fisheries Division,
Perak, Malaysia.

**2.40-3.00 PM (ICSDG2019-64)**
**The Present of Collective Action within the Ancient Sustainable Naturally Flowing Aflaj System in the Sultanate of Oman.**
**Al-Marshoudi Ahmed Salim Khalfan**
Centre for Global Sustainability Studies,
Universiti Sains Malaysia, Malaysia.

**3.00-3.20 PM (ICSDG2019-50)**
**Partnerships in Achieving SDGs: Exemplars from SEAMEO RECSAM.**
**Ng Khar Thoe**
Southeast Asian Ministers of Education Organizational (SEAMEO) Regional Centre for Education in Science and Mathematics (RECSAM), Malaysia.

**3.20-3.40 PM (ICSDG2019-40)**
**Education for Sustainability: Addressing Sustainable Development Goals through Project-Based Learning Approach.**
**Sook Wah Chan**
School of Biosciences,
Taylor's University, Selangor, Malaysia.

**3.40-4.00 PM (ICSDG2019-48)**
**Empirical Evidence of Community Resilience Elements and Community Response At Banda Aceh Province.**
**Ahmad Azan Ridzuan**
Faculty of Defence Studies and Management,
National Defence University of Malaysia, Malaysia.

# Poster Presentation

**TUESDAY-WEDNESDAY, 30-31 JULY 2019**

**The Population Study of Longtail Tuna, *Thunnus tonggol* (Bleeker, 1851) in the South China Sea.**
**Wahidah Mohd Arshaad**
Marine Fishery Resources Development and Management Department, Terengganu, Malaysia.

**DNA Barcoding for Effective Fish Diversity Assessment in Merbok River: Towards Developing Local Database of Metabarcoding Study.**
**Noor Adelyna Mohammed Akib**
Centre for Global and Sustainability Studies;
School of Biological Sciences,
Universiti Sains Malaysia, Malaysia.

# Abstracts - Keynote

**Achieving SDGs - Rising to the Challenge.**

**Dzulkifli Abdul Razak**
International Islamic University Malaysia (IIUM),
Malaysia.

**Abstract**

After three decades of Sustainable Development (SD), a concept introduced in 1987, it is timely to scrutinise what took place over the period with the intention to further heighten its achievements thus far. No doubt the concept has captured the imagination of many, given the overall performance level worldwide.

Nevertheless, there are a number of gaps that are beginning to show that must be addressed if SD is to gain more acceptance among the various sectors that have largely left out. Namely, this includes the indigenous population and the faith-based groups. In addition, is the issue of "ranking" that have been introduced recently that could skew what SD is all about.

All these point to the "new" challenges ahead that may lead to delving deep into the common "definition" of SD and the other ways of how "education" could be delivered for SD (ESD) towards greater achievements of SDGs for a sustainable future.

## PLENARY I

**Sustainable Integrated Water Resources Management Toward Practical Solution Addressing Water Issues in Malaysia.**

**Nor Azazi Zakaria**
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**Abstract**
Water resource has been considered as a vital resource for economic growth. Due to rapid economic development, rapid urbanization, climate change, and conflict in between water resource users has been an unresolved issue that threatens social and economic sustainability in recent years. Subsequently, despite having abundant precipitation, scarcity of water is a major concern in Malaysia. Overcoming these problems becomes more complicated due to issues with governance as there is an overlap in jurisdiction and functions among several ministries on matters related to water security. Malaysian Government had introduced the Urban Stormwater Management Manual (MSMA) in 2001 as a guideline to overcome technical matters associated with water problems which is parallel with the objectives in SDG. MSMA has since transformed the stormwater management concept in the country whereupon the old concept of "rapid disposal" in designing stormwater management systems was replaced by the concept of integrated "control at source". Adopting the approach of Sustainable Urban Drainage System (SUDS) is a novel attempt to solve major problems pertaining to water security. With some success implementation on integrated approaches on water management, water resource governance in Malaysia is another area that need to be resolved immediately in order to have a comprehensive solution on water security issues since the responsibility of different related government agencies having an overlapping function. These resolutions both technical and governance will contribute to transform a good approach in holistic water management in developing country towards a more sustainable water security.

**Keywords** – water resource management, climate change, SUDs, sustainability, integrated, SDG, governance.

## Bridging the Divide Between the Global Sustainable Development Goals and Their Local Implementation.

**Daniel Lang**
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Leuphana University Luneburg,Germany.

**Abstract**
On a global level the definition of the Sustainable Development Goals (SDGs) as normative framework for policy making has been a major achievement for moving towards sustainability. Yet, implementing the SDGs as guiding principles for concrete actions on a local level, though essential for reaching the goals, is often challenging. Related challenges include, among other things, the specificity of many context conditions such as the concrete sustainability problems faced or the availability of capacities and resources, the interconnectedness of the SDGs and a lacking awareness of the connection between local action and global impacts. In this presentation I will first outline some of these challenges that can lead to a divide between global goals and their local implementation as well as resulting implications for Sustainability Science. Second, I will introduce the idea of real-world experiments and real-world laboratories as possible approaches to address some of these challenges. For doing so, I will use the project Lüneburg 2030+ as illustrative example in which city administration, university and many relevant actors of the Hanseatic city of Lüneburg have engaged in a mutual learning process to foster local implementation of the SDGs. Finally, I will explore how scaling and transferring insights gained in real-world experiments and laboratories can contribute to amplify the impact of local initiatives and thus to better connect local actions and global goals.

# PLENARY III

**The Road to Achieving a Sustainable Community Extension Program: The FEU Project HOPE Story.**

**Myrna P. Quinto**
Far Eastern University, Manila, Philippines.

**Abstract**

Cognizant to what the Philippine Commission on Higher Education's (CHED) Strategic plan (2011-2016) to align its agenda with UNESCO's call for "education for sustainability, Far Eastern University's effort for sustainable development education has taken quite a promising direction. In recent years, FEU has devoted its efforts into changing the concept and the process of extending assistance to its partner communities through the creation and implementation of programs with sustainable development goals. These programs are research-based and responsive to the needs of the community and address the challenges of our surrounding communities. FEU is proud of having six community extension projects in five partner communities handled by a unit known as Community Extension Services (CES). We take pride on all these projects as each of them pursue specific Sustainable Development Goal (SGD). FEU's flagship community extension known as Project HOPE (Harnessing Offenders' Personal Empowerment) adheres to SGD 16: "promote just, peaceful and inclusive societies"; and is devoted to helping alleviate the plight of persons deprived of liberty (PDLs). As a flagship program with contributions from different academic departments, FEU Project HOPE recognizes and upholds the PDLs' right to life and human dignity like a ray of light amid a dark and cramped prison cell. Project HOPE started out as an extension work meant to provide a free legal assistance to the PDLs; and has been transformed into an extension service addressing the holistic needs of the PDLs primarily on the provision of psychological and health services, livelihood opportunities, and literacy programs. In order to ensure the sustainability of the project, a number of assessments were done by community extension volunteers from the University to evaluate its implementation. The results of these assessments show evidence of the impact of Project HOPE to the quality of life of PDLs.

In all these projects, the entire FEU community including administrators, faculty and students are committed to continue forging a sustainable community through education. Full details including challenges and accomplishments of each project will be discussed during the talk.

# PLENARY IV

**Gender Equality for Sustainable Development: Where Do We Stand?**

**Claudia Abreu Lopes**
United Nations University International Institute for Global Health (UNU-IIGH).

**Abstract**

Achieving gender equality and women's empowerment is integral to the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). Only by ensuring the rights of women and girls we can achieve progress for all, from employment to health care. But gender inequalities persist. While some indicators of gender equality are progressing, the most recent figures show that women represent less than 40 percent of those employed, occupy only about a quarter of managerial positions in the world, and face a gender pay gap of 12 percent (in a limited set of countries with available data). Women lack access to quality care, clean cooking and household fuels and are disproportionally represented in position of leadership in Global Health. Unsurprisingly, there are variations across countries and groups, with the most vulnerable bearing the brunt of unequal gender norms. In this talk, we will discuss the structural issues that lie at the root of gender inequality, the need to invest in more and better gender data and some pathways that lead to the transformation required to meet SDGs by 2030.

# PLENARY V

**The Campus as a Living Laboratory for Sustainable University: A Case Study from Chulalongkorn University.**

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**Abstract**

In recent years, "Living Laboratory" is one of the popular strategies for universities around the world to address campus sustainability issues. Nevertheless, in Southeast Asia, the idea of "Living Laboratory" has rarely been explicitly explored. Therefore, this presentation discusses the potential of "Living Laboratory" as a holistic framework for campus community to engage with campus sustainability challenges. At Chulalongkorn University, located in the tropical climate of Thailand, the sustainable university living laboratory initiative was transformed from the green campus initiative since 2010. The sustainability-focused living laboratory projects use the university campus as a testing ground to develop sustainability concept, products, processes and operations. Most importantly, the initiative provides the opportunity for stakeholders on campus to integrate academic and non-academic sustainable solutions to meet the sustainability goals in a real-world context. This presentation examines the results of past living laboratory projects at Chulalongkorn University and the role of the university engagement with non-academic partners. Finally, the challenges in the exploration and demonstration of sustainable campus solutions are discussed.

## SESSION 1A

### SDG 2: Studying a Malaysian Urban Private School.

**Siow May Ling[1,3,a], Osman Mohd Tahir[1,b], and Sridar Ramachandran[2,3]**
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**Abstract**

**Purpose** – This study aims to address food security issues (SGD 2) by introducing sustainable practices through permaculture principles in an urban private school in Malaysia. Food waste is a common sight in schools and the average Malaysian disposes 15,000 tonnes of food waste per day. Food waste comprises of spoilage, preparation waste and customer plate waste. Out of 15,000 tonnes, 6,000 tonnes were avoidable waste that could feed the poor.

**Design/methodology/approach** – Permaculture is the approach undertaken for this study. Recognized to inculcate sustainable practices, permaculture is derived from the word permanent agriculture. This consciously designed system emphasises on sustainable eco-systems mimicking the patterns found in nature. Programmes that will be introduced for this study include self-sufficient kitchens, reduction of carbon miles through on-site production of crops and extra co-curricular activities that include gardening and volunteerism.

**Findings** – Preliminary findings indicate that possible physical changes to the school compound can include rain-water harvesting system for on-site production of crop and food-waste separation system. Social changes towards zero-food waste within the school community requires behavioral changes as the urban school-goers are knowledgeable and have positive attitudes towards sustainable practices.

**Research limitations/implications** – Physical changes to the school compound is challenging due to the scarcity of unutilized land for crop production and other related activities.

**Originality/value** – The study will contribute towards the reduction of food-waste in urban private schools and towards formulating a framework for food security in schools.

**Keywords** – post-millennials, cradle-to-cradle, food security, SGD Goal 2, holistic education, responsible consumption.

**Skills, Spirituality and Strategy: Three Core Competences in Education for Sustainability.**

**Koh Hock Lye[1,2] and Teh Su Yean[3]**

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**Abstract**

The Brundtland 1987 report defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This conceptual definition implicitly acknowledges the uncertainty of what constitutes sustainability for the future. The definition has since expended over time. This expansion of definition has important implications for the ability of the education community to provide holistic solutions to advance the principles and practices of sustainability. It has also created a fragmented picture of what constitutes core competences needed for education for sustainability (EfS). Many laundry lists of competences proposed in the literature are disintegrated and create confusion and barrier to developing effective curriculum to support EfS. This paper provides a holistic narrative for constructing three core competences crucially needed by students for sustainability. Driven by sustainability goals, the three core competences are Skills, Spirituality and Strategy. Going beyond the vocational context, sustainability skills include higher order skills such as critical system analysis, holistic decision making and effective communication. The three pillars of sustainability are underpinned by the environment, the society and the economics. The weakest link in this three-pillar connectivity is the societal dimension. This weak link can be addressed through the lens of "spirituality" education, in which spirituality of nature is respected and revered. Requiring a transdisciplinary approach, strategy for sustainability must engage diverse stakeholders across multiple disciplines in knowledge creation, systems transformation and problem resolution. A brief exposition is presented to illustrate the difficulty in addressing the three-pillar demand through the lens of the three core competences. Examples of curriculum development for two sustainability-centred courses namely environmental modelling and water resource management in two Malaysian universities are discussed.

**Keywords** – sustainability competences, curriculum, water resources, environmental modelling.

**Tools for Making the 2030 Agenda One's Issue.**

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**Abstract**

**Purpose** – The purpose of this paper is to demonstrate tools for making the 2030 Agenda one's issue, such as "SDGs Lens."

**Design/methodology/approach** – The author developed "SDGs Lens" and other tools designing workshops for multi-stakeholder to comprehend SDGs as one's agenda. In this paper, the author
demonstrates the advantage of the tools by analyzing the deliverables of workshop.

**Findings** – By using the tools, participants of workshops found the following points.

(1) Problems of the real world involves plural goals of SDGs
(2) Such real problems are interrelated and complex in structure.
(3) The real problems are not unrelated to theirs.
(4) Therefore, they become aware of transforming our world means changing their own mind and action.

**Research limitations/implications** – The tools are effective in Japan; however, it has not verified universality of the tools in other country yet.

Practical implications - The tools could advance to develop methods in order to connect SDGs to people's mind and action for resolving real problem in the world.

**Social implications** – The tools could contribute to increase the number of the people who pursue sustainable world learning the relationship between SDGs and real problems.

Originality/value – Tools for linking SDGs to real problems as one's issue are almost nothing but my research.

**Keywords** – SDGs Lens, Making the 2030 Agenda One's Issue, Workshop, Tool, One's Issue.

**Factors Influencing Sustainable Development In Indonesia's Decentralization Policy.**

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**Abstract**

**Purpose** – This research aims to explore the relationship between the decentralization policy and the performance of sustainable local development in Indonesia.

**Design/methodology/approach** – There are two methodologies: (1) Sustainable Local Development Index (SLDI) analysis with the structural equation model; and (2) the multiple regression model on panel data to analyze the relationship between decentralization policy indicators and sustainable local development index.

**Findings** – The effective decentralization policy in Indonesia seems to be linked more quality of sustainable local development strongly to some dimensions. In particular, the quality of the social-economic dimension appears to be more decisive than others.

**Research limitations/implications** – This research will contribute to an understanding of the role of Indonesia's decentralization policy in sustainable local development, and thereafter it unfolds some recommendations on accelerating sustainable programs from multi stakeholders.

**Practical implications** – The research can improve right decentralization policies at the right moments for sustainable local development in defining effect on what Indonesia's provinces will 'look' like in the future. Local governments require new transformative ideas and a more constructive role for better comprehension, cohesion, fluidity, and a greater policy.

**Originality/value** – The research can investigate the performance of sustainable local development with a certain index measurement based on creating the composite index of sustainable local development. Afterwards, the research is able to examine the relationship between the decentralization policy and the performance of sustainable local development with the panel data analysis.

**Keywords** – sustainable development, decentralization policy, local government, sustainable local development index, structural equation model.

**A Phase Theory for Relevance Between Organization and SDGs.**

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**Abstract**

**Purpose** – This paper aims to show the importance of phase classification for understanding the relevance between oneself and SDGs.

**Design/methodology/approach** – Constructing original theoretical framework and classifying of practical cases of companies and local governments in Japan.

**Findings** – This paper confirmed that the phase classification using the system theory perspective is the effective way to understand the level of practices toward SDGs by companies and local governments. Also, it has become clear that most of SDGs practices of companies and local governments in Japan are currently in the "fitting-phase".

**Research limitations/implications** – The cases in this paper are limited to Japan, however, the phase theory can be generalized and used in each country. Practical implications - This phase classification is useful as a method to understand the level and impact of the organization's practices toward SDGs appropriately.

**Social implications** – This phase theory can unveil "SDGs-Washing" or "cherry-picking" practice for implementing SDGs.

**Originality/value** – This study has introduced not only the perspective of awareness and implementing toward SDGs, but also the perspective of relevant between systems of social, economic and environmental systems and organizations into the theoretical framework.

**Keywords** – Phase Classification, Relevance between oneself and SDGs, System Theory, Companies and Local Governments, SDGs-Washing, Cherry-picking, Fitting-phase.

## Dermestid Beetles as Sustainable Alternative for Bone-defleshing Method.

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**Abstract**
**Purpose** – This study compares the sustainability of bone cleaning procedure between dermestid beetles and generally applied defleshing chemicals on a goat's head. Chemicals, cost, procurement, duration of bone preparation, upkeep of beetles, environment and sustainability are compared.
**Design/methodology/approach** – *Dermestes maculatus* colony was used to clean a goat's head specimen according to its condition necessities. This harmless insect decomposes human or animal remains by consuming the attached meat, that especially convenient when involving tiny and delicate skeletons, resulting in a clean skull.
**Findings** – The results show that chemicals are easier to procure but cost more compared to beetles in the long run while, the number of beetles required for defleshing is numerous hence reduced the cleaning period.
**Originality/value** – This research contributes to the sustainable bone preparation approach where beetles should be utilized wherever possible compared to chemicals as it is friendlier towards the environment.
**Keywords** – Dermestid beetles, Sustainable bone-defleshing method, Environmentally friendly.

**Community Forest Management to Achieve SDGs in Marginal Areas of Bangladesh.**

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**Abstract**

**Purpose** – Forests and particularly the community managed forests have a role to achieve a number of sustainable development goals (SDGs). This paper, drawing data from four community forest management (CFM) projects in south-eastern Bangladesh, explored how the CFM can contribute to achieve some selected SDGs in marginal areas.

**Approach** – An analytical framework consisting of enabling factors and challenges that influence the CFM to achieve SDGs was used, and adopted a mixed method to collect relevant qualitative and quantitative data.

**Findings** – Divergent forest conditions and enabling factors in four CFM sites have had differential contribution to SDGs. Heterogeneity of user groups, insufficient coordination, absence of strong motivation, and land tenure conflicts had affected the attainment of SDGs. Although CFM was meant to conserve forest biodiversity (SGD 15), but it helped to attain other important SDGs including poverty reduction, food security, health and well-being, ensuring education, equity, clean water, energy, economy, climate change, and inclusive institutions and governance.

**Originality/value** – The CFM in marginal forested areas should be viewed as an integral part of sustainable community development strategies which need sectoral coordination and integration of relevant policies. An integrated and coordinated approach would bring policy coherence, optimize resource uses and bring real development to the community.

**Keywords** – Indigenous communities, Agroforestry, Co-management, Governance, Resource system.

**Nonlinear Dynamic Analysis of Multi-Storey RC Building Models.**

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**Abstract**

Purpose – The objective is to assess the building performance of private educational institute reinforced concrete building with generic 3D frames of 5, 10 and 20 storey height models.

**Design/methodology/approach** – Models are simulated under series of earthquake motions which include pre-shock, main shock and aftershock scenario by finite element program ETABS. The behavior factors of 1, 1.5, and 2 in accordance to EC8 (Ductility Class Low DCL) followed by Malaysian Annex MS EN 1998-1-2015 were applied in simulations. Total of 8 seismic ground motions were selected to quantify the structural frame model for nonlinear dynamic time history analyses. One real time sequential seismic ground motions and three artificial harmonic ground motions recorded on shaking table ranging from 0.18g to 0.64g were applied in the simulations.

**Findings** – The outcome of this study identifies the most suitable behavior factor for each framed building model based on height, number of stories and structural behavior. Hence, the findings contribute to the society in the formulation of European Code 8 National Annex in near future for structural seismic resistance design.

**Originality/value** – The study concludes that low rise building model with ductility class low (DCL) had a tendency to absorb lower to higher 'g' values and resist the earthquake loading due to the strength of framed structure rather than its ductility

**Keywords** – Nonlinear dynamic analyses; Reinforced Concrete Framed Structure; Multiple Seismic Excitations; ETABS; behavior factor.

**Analysis of Heavy Metal Concentration in Transplanted Lichen *Usnea misaminensis* around Kota Kinabalu, Sabah.**

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**Abstract**

**Purpose** – This study aim to analyze the heavy metals concentration (Cu, Fe, Zn, Pb, Mn, Cr) at Kota Kinabalu, Sabah using transplanted lichen.

**Design/methodology/approach** – Samples of *Usnea misaminensis* were transplanted to the environment of the urban area in Kota Kinabalu, Sabah. The lichen was collected from Mt. Kinabalu Park which is a remoted area. 15 sampling stations were selected and transplanted lichens were exposed to heavy metals in those stations in about 4-6 weeks. Exposed lichens were analyzed using the inductively coupled plasma mass spectrometry (ICP-MS) to determine the concentration of heavy metals in each sample. Pearson Correlation Coefficient also been used to show the relationship between heavy metals concentration in lichen and motor vehicles frequency.

**Findings** – Result showed that iron (Fe) has the highest concentration with 84.43µg/g and chromium (Cr) has the lowest concentration with 0.66 µg/g. Statistical test (Pearson Correlation Coefficient) showed that there is significant relationship between heavy metals and motor vehicles frequency with r is 0.0000 and p-value $< 0.01$. These findings prove that the increasing number of motor vehicles will also elevate the concentration of heavy metals in the atmosphere.

**Research limitations/implications** – The case study used is the Kota Kinabalu, Sabah. The implications are relevant for all heavy metals in Kota Kinabalu, Sabah.

**Practical implications** – Transplanted lichen can be used as the alternative method in measuring the heavy metals concentration at urban area.

Social implications – All the data can assist the authorities, urban planner and etc. to design a better road network to prevent congestion and accumulation of heavy metals in urban area.

**Originality/value** – The study concludes that transplanted lichen can be the best approach in order to determine the air pollution level in urban area to achieve sustainable development goals.

**Keywords** – Transplanted lichen, Air quality, urban ecology, Sustainable development, Ecological indicator.

**Building the Campus Landscape as a Model of Sustainable Cities and Communities.**

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**Abstract**

**Purpose** – This paper explores the implementation of project-based learning conducted in an agriculture faculty to engage the students to plan, implement and manage small-scale landscape improvements in the campus.

**Design/methodology/approach** – This project-based learning is an integrated course assessments for three courses involving the third-year students from the Horticulture and Landscaping Programme (HG35). Students were assigned to six sites in the campus green spaces within a semester (fourteen weeks). The students were required to conduct the landscape project in two stages; design proposal and project implementation. These stages emphasised the adoption of Sustainable Design Guidelines in which the students demonstrate the problem-solving skills and generate creative solutions to enhance the landscape. The final evaluations were conducted based on 1) compliance of the project to the Sustainable Design Guidelines; 2) students self-evaluation of their sustainability knowledge enrichment upon the completion of the project.

**Findings** – The students demonstrated the ability to conduct the landscape project in which they adopt sustainable landscape planning and construction processes. Furthermore, the students reflected their improved attitudes concerning sustainable built environment through the findings from the questionnaire survey. The landscape project is an example of a successful action-oriented project to inculcate sustainability through decision-making and responsible actions.

**Research limitations/implications** – Future research could use the results of this study as a basis to develop a strategy to encourage community participation through specific learning objectives.

**Practical implications** – The action-oriented pedagogy provides a platform to develop key competencies for sustainability in shaping the future generation.

**Social implications** – It empowers students by providing the experience of spatial planning towards the creation of sustainable cities and communities (Sustainable Development Goals 11). The long-term outcome of the project prepares the students to think, plan and act sustainably and enrich their competency to address the sustainability-related issues.

**Originality/value** – This paper highlights the implementation of project-based learning aiming to enhance the students' knowledge, skills, and attitudes to transform the students into sustainability-change makers.

**Keywords** – University, campus landscape, project-based learning.

## A Study on the Metrical and Morphological Effects of Varying Subject-To-Camera Distances (SCDs) In Face Recognition Using Mannequins.

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**Abstract**
**Purpose** – The purpose of this study is to assess the metrical and morphological effects of varying Subject-to-Camera Distance (SCD) in face recognition, in an instance where unidentified remains are discovered.
**Design/methodology/approach** – A series of 100 interviews were conducted in Health Campus, Universiti Sains Malaysia, among students and staffs, to measure the distortion level of two sets of mannequin face photographs taken at varying distances.
**Findings** – It was found that decreasing SCD caused increasing distortion. Although distortion is visible, the level of distortion does not render the photographs unrecognisable; face recognition is still possible.
**Practical implications** – Although SCD has yet to become standardised practice during skull- photo superimposition, several authors agreed that SCD maintained between 100 centimetres and 150 centimetres, would deem the distortion to be within permissible tissue thickness limit. Thus, improving the rate of true positive matches.
**Social implications** – The number of unidentified human remains and rate of false matches can be reduced through a well-versed facial identification methodology. This can reduce all forms of violence by inhibition of 'mens rea' or a guilty mind. Which in consequence, averted the possibility of 'actus reus' or crime itself to reoccur in the future.
**Originality/value** – This research uses mannequins which simulates human faces as they would generate novel findings suitable for daily analysis.
**Keywords** – Facial Recognition; Distortion; Superimposition; False Matches; Subject-to-Camera Distances.

# The Role of Entrepreneurship Between the Internal Environments and Effectiveness/Alignment of Public Tertiary Institutions in Nigeria.

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**Abstract**
**Purpose** – This study examines the contribution of public entrepreneurship on the effectiveness and alignment of public tertiary in Nigeria
**Design/methodology/approach** – In this study, public entrepreneurship was examined by testing developed hypotheses of an integrated model. Data was collected from 160 academic administrators of public tertiary institutions in Nigeria.
**Findings** – The findings show the mediation of entrepreneurship between the internal environment of the public tertiary institution and its effectiveness and alignment.
**Research limitations/implications** – The study used public tertiary institutions in Bauchi state Nigeria but also applicable to all public tertiary institutions in Nigeria.
**Practical implications** – Public tertiary institutions should adapt a new management practice through entrepreneurial role to enhance performance in terms effectiveness and alignment.
Social implications – The findings support entrepreneurial process as important in improving organizational performance of public tertiary institutions.
**Originality/value** – The study provides that entrepreneurship has a mediating effect between the internal environment and Organizational performance in terms of effectiveness and alignment of public tertiary institution.
**Keywords** – internal environment, entrepreneurship, effectiveness, alignment and PLS.

**A Comprehensive System Study on Indian Firecracker Industry and Analysing Gaps Affecting Sustainability.**

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**Abstract**

**Purpose** – The purpose of this paper is to study the entire system of Indian firecracker industry, analysing gaps in terms of three pillars of sustainability and finding the gaps affecting the system.

**Design methodology** – An Exploratory Ethnographic study involving collecting secondary and primary data from firecrackers manufacturing firms, retail shops and supporting government organisations.

**Findings** – The first part of the paper enquires the scenario of chemicals used in making of crackers and exhibits the perception of "setting money on fire" thus influencing the economic pillar of sustainability. The second part of the paper intends to provide the effects on living existence and environment causing pollution due to bursting of crackers as low-cost fireworks tend to have highly unstable chemicals which are extremely toxic causing skin diseases and triggering allergies. The third part maps down Sivakasi - A town in Tamil Nadu, India entirely dedicated in manufacturing of firecrackers, produces around 90% of the country's fireworks that includes unlicensed units as well. To analyse social sustainability, industry's entire system — working conditions, safety measures, process, materials involved and stakeholders was studied.

**Practical implications** – The results could be used to improve the working standards in the industry, to find an alternative intention of bursting firecrackers and not just for entertainment.

**Originality/value** – A sustainability assessment and causal loop analysis reveals long-term risk scenarios.

**Keywords** – Fireworks industry, Hazardous chemicals, Environment pollution, Pillars of Sustainability, System study.

# The Socio-Economic Impact of SDG Project Executed by the Federal Ministry of Power, Works and Housing From 2016-2018.

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**Abstract**

**Purpose** – The aim is to identify various projects executed through the Federal Ministry of Power, Works and Housing from 2016-2018, evaluate residents perception of the executed project, identify and analysis the socio-economic impact, and also evaluate challenges and possibility.

**Design/Methodology/Approach** – Mixed method was adopted for the study, questionnaire and interview guide were prepared and administered to residents living in area of project execution. The library research method was used to gather secondary data from textbooks, articles, journals and government publications. The analysis involved the use of descriptive and inferential statistic.

**Findings** – The research revealed that the SDGs projects under the FMPWH cut through the Health, Education, Infrastructure, Water/Sanitation, Electricity and Poverty Reduction. The study revealed that the socio economic indicators of all the selected project location are above 70% indicating very high socio economic impact.

**Practical Implications** – Needs Assessment and Continuous engagement with host/benefiting communities for long term project sustainability.

**Social Implications** – The SDGs is one of the few programmes that had positive impact on the lives of the common man at the grassroots.

**Originality/Value** – This paper concluded by recommending proper monitoring of project after execution, community ownership, timely release of fund by the government to meet the financial year, private sector participation in the SDG.

**Keywords** – Socio-Economic Impact, Sustainable Development Goal (SDG), Government, Constituency Project and Zonal Intervention.

**Labour Migration and Sustainable Development: Asia Pacific Region to Malaysia.**

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**Abstract**

**Purpose** – This study aims to examine the inter-region low skilled labour migration from Asia-Pacific countries, facilitating in achieving the sustainable and effective management of migration policy in Malaysia, competency to the economic growth.

**Design/methodology/approach** – Employment multiplier, linkages effect of industries and simulation analyses are conducted to reflect the overdependency of low skilled labour migration policy in Malaysia, integrating to the economic growth.

**Findings** – The results highlight the occurred strong integration between sectors and employment of low skilled migrant workers from the sub-regions of Asia-Pacific to the host economy, Malaysia. Besides, the key sectors from the linkages determined the effectiveness of foreign labour in productivity and sustainability of the policy in managing the migration.

**Practical implications** – The analyses of this study provide to recommendation for sustainable development of migration policy especially on the dependency of inter-region low skilled migrant workers in Malaysia.

**Originality/value** – This study contributes to the theories of migration policy and acknowledging the effectiveness of the foreign labour employed in Malaysia, in adherence to the Sustainable Development Goals related to the international migration on the inflow of low skilled migrant workers from the Asia-Pacific region to Malaysia.

**Keywords** – Low skilled, migration policy, Sustainable Development Goals, Asia-Pacific sub-regions.

## Understanding Flight Intentions of Residents in Crime-ridden Neighbourhoods.

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**Abstract**
**Purpose** – Crime has been a major inhibitor to sustainable development and neighbourhoods with rampant crime are often deserted as residents move to safer areas. Nonetheless some residents are resilient. This paper identifies how the environment and emotional attachments encourage residents to remain in an area in spite of escalating crime.
**Design/methodology/approach** – The study was conducted in two stages; first the list of high-crime neighbourhoods was obtained from the local police, followed by a survey of residents living in the area. The data obtained was then analysed using structural modelling by partial least squares (PLS-SEM).
**Findings** – Findings revealed that in spite of high crime, many still felt safe given a good ambient environment and confidence in their own ability to avoid victimisation. Surprisingly residents did not consider physical security features to give them a sense of safety; instead they relied primarily on good community relationships to keep watch for one another.
**Practical implications** – The findings provide recommendations to property developers on how the perceptions of safety can be improved through spatial planning; and to governments how safety may be incorporated into neighbourhoods through community engagement programmes.
**Social implications** – This paper provides enables understanding how perceptions of safety may be bolstered, to prevent urban flight and ensure perpetuity of traditional housing estates.
**Originality/value** – This paper investigates the inner-workings how crime is linked to housing-oriented behaviour through empirical investigation.
**Keywords** – Social sustainability, crime, neighbourhood, urban flight, housing, intention to stay.

**Smart Urbanism in the SDGs Era: Should Smart Cities Comply with the Politics of Capitalism, Social Democracy, or Ecological Democracy?**

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**Abstract**

**Purpose** – This paper aims to examine which political paths, between capitalism, social democracy or ecological democracy, should the smart urbanism movement follow in order to achieve the Sustainable Development Goals (SDGs).

**Design/methodology/approach** – This study applied a document analysis design on the stakeholders' literature, and explore empirical examples related to smart urbanism and SDGs in Malaysia.

**Findings** – This study found that to achieve SDGs under current capitalism, hegemonies is a significant challenge. However, it is possible with the trust given by the government in the form of participatory politics. SDGs also need to be overhauled and rewritten under ecological democracy – based on the principles of the 'commons'.

**Practical Implications** – The implication of the findings of the study include creating a call for support for emerging ecological democracy that is particularly compatible with SDGs as well as embedded in the natural environment, social and economic developments.

**Originality/value** – This paper has contributed to the understanding of the relationship between smart urbanism and SDGs, ideologies available for countries leaders to consider, and hypotheses for future research.

**Keywords** – Malaysia, Sustainable Development Goals, Smart City, Liberal Democracy, Participatory Politics, Green Politics.

**Connecting Research with SDGs: A Quantitative Overview of Land-use Studies.**

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**Abstract**

**Purpose** – The purpose of this study is to assess the connection of land-use studies with individual Sustainable Development Goals (SDGs), using the six territories on Borneo as case studies.

**Design/methodology/approach** – This study developed a new method quantify the connection of land-use research with SDGs through systematic collection and analysis of academic publication in large quantity. A total of 4,127 publications were identified and included in the analysis.

**Findings** – For the case of Borneo, the results show that, in quantitative manner, the differences and overlaps between SDGs can be very uneven (Figure 1). SDG-1, SDG-3, SDG-5 and SDG-10 received relatively less attentions, while SDG-2, SDG-6, SDG-8 and SDG-13 are among the popular topics for researchers (SDG-15 is excluded from comparison as this sampling is about land-use). Furthermore, the focuses of researchers from different countries also vary significantly. The overall picture change substantially when (i) only journals with impact factors or (ii) papers with citations are considered.

**Research limitations/implications** – The list of keywords proposed in this study can be deemed first attempts to sketch the possibilities of linking SDGs with keywords. In the long run, it requires in-depth discussion and more importantly consensus among the experts and stakeholders, potentially coupled with complex mechanisms to more accurately read between the lines.

**Practical implications** – The method offers more possibilities in analysing and monitoring land-use research. It is clear that the gaps between SDGs can be huge. Furthermore, one should acknowledge the fact that local and foreign researchers focus on different aspects of land-use, especially when this is described using the SDG framework. This reflects that there are many different issues to be overcome in achieving land-use sustainability, and thus would be unrealistic to isolate any kind of efforts, especially in the sense of conservation, global climate change and socio-economic development.

**Social implications** – This study demonstrated an additional way to understand how research can be linked to the efforts in achieving different SDGs.

**Originality/value** – It can be deemed first of its kinds that employs SDGs as the core framework to analyse the trends in land-use research, with a method that has the potential to evolve with time.

**Keywords** – SDG, Sustainability, Land-use, Forest, Agriculture, Borneo, Kalimantan, Sabah, Sarawak, Malaysia, Indonesia.

**Rising Above and Beyond, A Multi-systemic Approach in Addressing Social ills among Girls from the bottom 40 Community.**

**Barathy Devi Murugaya**
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**Abstract**

**Purpose –** The paper aims to show a Multi-Systemic interventions initiated for Girls from the marginalized Bottom 40 community by adopting the UN sustainable Development Goals.

**Design/methodology/approach** – An impact assessment was carried out to provide substantial input for the programme using both quantitative and quantitative methods. (Focus group discussion, one-to one interview with selected groups: Parents/Teachers/Stakeholders/Service providers)

**Findings** – 20% of school-going children drop out before reaching higher secondary. Mainfactors behind students dropping out of school and they are disinterest, poverty, parents who were neglectful, illness, disability, social problems, learning difficulties and underage marriage.

**Research limitation/implications** – Using online tracking exam analysis system gives access tostudent's attendance, co-curriculum, exam results and overall performance in school. Data's collected exercise illustrated that MLL programs plays an undeniable vital part in the lives of young girls.

**Practical Implications** – Maharani (Princess) Learning Lab created a safe space for students to attend various self-development programs consistently organized by Maharani Learning Lab and participating in Maharani Camps (Module Tailored made according to SDG 4 & 5: Phase 1, 2 &3).

**Social Implications** – Increase self –confidence, academic grades improved, decrease in school dropout, good communication skills and hope in achieving their dreams

**Originality/Value** – Adopting (SDG 4 & 5) from UN goals to end poverty, protect the planet, and ensure prosperity for all as part of the new sustainability development plans achieved over next 15 years.

**Keywords** – Marginalized Community, Support System and Social Mobility, Safe space.

**Distribution and Density of *Rastrelliger* spp. Larvae in Kedah Waters.**

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**Abstract**

**Purpose** – The purpose of this study is to determine the density, distribution and spawning area of *Rastrelliger* spp. larvae in Kuala Kedah waters.

**Design/methodology/approach** – Sampling was conducted twice which were in August and September 2018 using a larvae net. Larva *Rastrelliger* spp. were isolated and stored in a 4% of formalin. Fish larvae were observed under stereomicroscopy and each larva were identified until family or genus. Density and distribution of larvae are estimated according to the number of individuals per 1000 cubic meters of seawater.

**Findings** – The result of this study showed that the distribution and highest density of *Rastrelliger* spp. larvae is 6.7/1000m3 in September 2018 that were in the southern area of Kedah waters which near Yan. The composition of fish larvae for the Engraulidae family recorded the highest percentage in August and the Scombridae family recorded the highest percentage in September 2018 in Kedah waters.

**Research implications** – Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources.

**Originality/value** – The investigated setting is fundamental finding for sustainable fishery management of the selected fishery resources at the national, regional and global levels.

**Keywords** – *Rastrelliger* spp., density, distribution and spawning area

**Computer: Solution to Architectural Education Sustainability in Nigeria.**

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**Abstract**

**Purpose** – This study is aimed at discussing computer, A problem or solution to architectural education sustainability and practice in South- East Nigeria, A way forward.

**Design/methodology/approach** –The research methodology adopted was the mix use method involving the use of questionnaires, interviews and observation with site visitations of the work done by students of architecture department from selected six (6) higher institutions in South-East Nigeria.

**Findings** – Human over the past decades there have been giants strives sustainability in technology development , this have affected every human institutions including the building industry of which architecture plays a good role. With computer, it is easy to draw more alternative designs, and make revisions on the design, better understanding and accurate design.

**Research limitations/implications** – Introduction of computer and its programs have enjoyed high sustainability acceptance but to a high extent made most architects less creative especially students who have become addicted to it and makes them less effort to become creative.

**Practical implications** – The developmental sustainability strives aimed at breeding design support system has resulted to the introduction of computer and its various programs which have been used to develop complex building designs, increased architects efficiency, reduced time consumption in design leading to the achievement of various self supporting and smart buildings.

**Social implications** – Architectural studies is one of the most expensive courses in the higher institution because it is visual base and cannot be defended on grammatical assumptions if the solutions to problems are not humanly realistic.

**Originality/value** – This research studies the advantages and disadvantages of this trend with the view of finding balance.

**Keywords** – Architectural-Design, Computer Sustainability, Creativity, Computer-Programs.

## Integration of Green Infrastructure: A Walkable Campus.

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**Abstract**

**Purpose** – This study is to assess the potential and find ways to transform UMS Sandakan into a walkable university.

**Design approach** – Site Inventory and Analysis was carried out for two months to gather the data of the campus. A questionnaire survey was distributed to the target users to identify what more the University could do to encourage to provide a pleasant walking experience.

**Findings** – Majority of the paths users are students that walk to attend lectures and practical work. They also used the paths for jogging and running daily. The study confirmed there is a vast potential to improve the networks of the path in UMS Sandakan by integrating several green infrastructures to the design strategies.

**Research Limitations/Implications** – The recommended design strategies are tailored to the existing condition of the UMS Sandakan campus. However, other researchers interested in making their spaces more walkable could benefit from the design strategies suggested in the study. For future research, it is suggested to study the potential of integrating bike lanes to the campus.

**Social Implications** – Adopting the recommended design strategies to install green infrastructure such as shade trees, covered pedestrian paths etc. could support a movement to adopt one of the recommended sustainable transportation systems, thus making the campus more environmentally friendly. Currently, the harsh microclimates deter a pleasant walking experience on the campus.

**Originality** – This study concludes that UMS Sandakan should upgrade the current condition of the path networks so more people would be willing to walk knowing their walking experience would be more legible, safer and comfortable.

**Keywords** – Green Infrastructure, Walkability, Students' Engagement.

**Performance of Hydroponic Growers for Organic Cultivation of *Gynura procumbens*.**

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**Abstract**

**Purpose** – The purpose of this study is to investigate the performance of different types of hydroponic growers on plant growth yield and nutrient uptakes for growing of *Gynura procumbens* in an aquaponics system.

**Design/methodology/approach** – A backyard size aquaponics unit was realized containing different types of growers namely media grow bed, floating raft, and nutrient film technique (vertical and horizontal systems). Experiments were carried out for eight weeks in which water quality, fish growth and plant yield were monitored on weekly basis. Other parameters measured include water temperature, pH, total suspended solids (TSS) and dissolved oxygen (DO) concentration.

**Findings** – Water temperature, pH, TSS and DO concentration values remain within the reasonable limit for growing of *Gynura procumbens* and culturing of Red Nile Tilapia. A high ammonia to nitrates conversion was achieved for the studied aquaponics system. It was also found that the highest plant yield was achieved in floating raft unit, where *Gynura procumbens* grown four folds higher throughout the eight weeks cultivation period.

**Research limitations/implications** – Future research could use the results of this study as a basis for establishing a suitable organic herbs farming unit for urban living.

**Practical implications** – Online monitoring features would ensure consistent and high quality plant and fish growth in the aquaponics system.

**Social implications** – Aquaponics provide easy access to pricy aquatic commodity and crops whilst reduce import of veggies and aquatic products.

**Originality/value –** Till date, no literature has yet been reported on organic cultivation of *Gynura procumbens* in different types of hydroponics grower.

**Keywords** – Aquaponics, Hydroponics grower, *Gynura procumbens*.

**The Willingness to Reduce Plastic Waste from the Restaurant Industry in Bali.**

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**Abstract**

**Purpose** – The purpose of this study is to assess the willingness to reduce plastic waste from the restaurant industry in Bali. The results can be used to categorise the establishments visited according to the amount and type of plastic offered to customers as part of the services.

**Design/methodology/approach** – The questionnaires were distributed to thirty restaurant manager in Kuta, Bali. The data analysis is conducted by using descriptive and inferential statistics

**Findings** – This survey indicates that there is a high willingness in restaurant industry to reduce the consumption of single-use plastics in their operation but there are still several issues that need to be addressed..The willingness of restaurant industry to reduce the use of plastic packaging is 80%.

Research limitations/implications - There is not yet any government regulation that is specifically aimed for plastic waste management. The perspective and awareness of the restaurant industry towards this issue plays a significant role in mitigating the plastic pollution.

**Practical implications** – The regulation of the plastic waste that is generated from the restaurant industry has to be managed in a way that does not cause further pollution and damage to the environment in order to protect the sustainability of the business itself and the environment.

**Social implications** – To fulfill its goal it thrives to increase awareness in conservation areas, to carry out a sustainable development and to maintain a clean and healthy environment.

**Originality/value** – The knowledge of price and alternative items to plastic is a factor that impacts on the willingness to pay extra amount for reducing plastic waste by switching to these alternatives. Switching to plastic packaging alternative is 53% that indicates their willingness to pay extra amount to make the better environment.

**Keywords** – Sustainable Consumption, Plastic Waste, Willingness to reduce, Sustainable Development, Environmental Economics.

**Reproductive Potential of the Indian Squids *Loligo duvaucelii* from Trawl Along Perak Waters.**

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**Abstract**

**Purpose** – The purpose of this study was to evaluate the biological and fecundity potential of Indian squids, *Loligo duvaucelli* on Perak waters.

Design/ methodology/ approach – This study was performed by conducting a trawl survey at Perak waters that covered the area between latitude 04° 02.945' N to 04° 18.236' N in January 2019. Information on fishing ground, weight, length and ovary weight were recorded. The ripe ovaries from 21 samples from stage IV onwards were preserved into 5% formalin and fecundity assay were performed using a sub sample of 0.1 mg ripe ovary from three different parts of ovary including anterior, middle and posterior part.

**Findings** – The fecundity of Indian squid was in a range from 4, 529 to 31, 741. The logarithmic relations between fecundity and length of squid, fecundity and weight of squid and fecundity and ovary weight were linear suggesting that the fecundity generally increased with the increasing of length, weight and ovary weight of squid.

**Research limitations/ implications** – Information on the biology and fecundity of Indian squid are crucial for fishery management plan of this species to ensure the sustainability of Indian squid resources in Perak waters. The limitation of this study is further data collection and survey is needed to confirm the potential for reproduction of Indian squid population in Perak waters.

**Practical implications** – The result of this study will reveal the reproductive potential of Loligo duvaucelli in Perak water and will provide information to fishery managers on the estimated resources status of this species.

**Originality/value** – The information on reproductive potential and its relationship with length, body weight and ovary weight are the essential point in order to get an effective fisheries management and policy development at the national, regional and global levels.

**Keywords** – Indian squid, *Loligo duvaucelli*, fecundity, fishery management, sustainable.

**Environmental Performance Evaluation on Potential Biological Treatment of Food Waste.**

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**Abstract**

**Purpose** – The purpose of this study is to evaluate the environmental impact of organic fraction municipal solid waste treatment techniques, namely composting and anaerobic digestion by using the Life Cycle Assessment approach.

**Design/methodology/approach** – This study used Life Cycle Assessment approach concerning a facility located at Zero Waste Campaign, University Malaya for a period of one year in 2018. SimaPro 9 software was used to analyze the result from organic waste treatment of anaerobic digestion in Cowtec machine and aerated static pile medium-scale composting.

**Findings** – Three main impact categories were found in anaerobic digestion that is acidification potential (7.83Ekg SO2), climate change (2.79E+02kg CO2), depletion of abiotic resources in fossil fuels (1.31E+04MJ). Whereas, for composting, the three main impact categories resulted were eutrophication potential (4.72Ekg PO4), freshwater aquatic ecotoxicity (3.06E+06kg 1,4-dichlorobenzene), and marine aquatic ecotoxicity (11.95E+09kg 1,4-dichlorobenzene).

**Research limitations/implications** – The case study used a combination of Eco-Invent3.1 Database and open literatures to fill the gap of inventory input of the method due to the limitation of inventory information on organic waste treatment in Malaysia.

**Originality/value** – The investigated research setting is considered unique as the results of this study act as a basis for policy-makers to highlight the importance of acquiring significant data on elementary flow of potential environmental impact. Moreover, this study would performed as indicator to fulfill the gap of knowledge on adapting integrated sustainable waste management that tackles the main four key pillars (social, economic, technology, decision-makers) to achieve environmental sustainability.

**Keywords** – Food Waste, SDG 11.6, Life Cycle Assessment, Anaerobic Digestion, Composting, Global Warming Potential.

**Neritic tuna fishery and biological aspects of *Euthynnus affinis* in Perak**

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**Abstract**

Purpose – This paper aims to provide information on biological parameters and exploitation rate of *Euthynnus affinis* in the north part of Peninsular Malaysia.

Methodology In this study, monthly biological data were collected from Bagan Panchor, Perak and statistical data provided by Department of Fisheries Malaysia were used to analysed the neritic tunas landing trends.

Findings – Monthly length weight measurement of *Euthynnus affinis* showed a relationship of $W = 0.000032\ L^{2.8859}$. This present study will also include information on biological aspects of *E.affinis* such as growth parameters and length distribution.

Research limitations – From this study, *E. affinis* spawning season can be predicted, however due to little information on the fishing ground, it is hard to determine the spawning areas of this species. In 2019, we will used vessel monitoring system (VMS) as an added component to this study that will provide an insight of the spawning areas of *E. affinis*.

Practical implications – Findings from this study will help Department of Fisheries in planning and managing the tuna fishery in Malaysia in a sustainable way.

Keywords – neritic tuna, *Euthynnus affinis,* growth parameters.

## Achieving SDG 3.8.2: Financial Protection Against Catastrophic Health Expenditure.

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**Abstract**

**Purpose** – The purpose of this study is twofold; 1) to measure SDG 3.8.2 on the proportion of households with catastrophic health expenditure (CHE) and 2) to determine its associated factors

**Design/methodology/approach** – A cross-sectional study using secondary data obtained from the 2016 Household Expenditure Survey (HES). The World Health Organization (WHO) approach of calculating CHE was applied and households whose health spending exceeds 10% of the total expenditures is defined as experiencing CHE.

**Findings** – A total of 13015 households were involved. The proportion of households experiencing CHE was 2.8%. The four factors that were statistically significant with CHE were female-led households (Adjusted OR 1.6; CI 1.25, 2.03; p-value <0.001), households in rural area (Adjusted OR 1.29; 95% CI 1.04, 1.61; p-value = 0.022), small household size (Adjusted OR 2.4; 95% CI 1.81, 3.18; p-value <0.001) and head of household aged below 60 years old (Adjusted OR 2.34; 95% CI 1.81, 3.18; p-value <0.001).

**Research limitations/implications** – This study used secondary data; some of the critical factors associated with CHE were unavailable. Recall bias may affect the accuracy of the data obtained.

**Practical implications** – The results of this study may be used to determine the recipients of Peka B40 and MySalam insurance schemes.

**Social implications** – Malaysians are financially protected from CHE, and we are on the right tracks towards achieving the universal health coverage status by 2030.

**Originality/value** – The study is the first to utilise the 2016 HES data in measuring the SDG 3.8.2.

**Keywords** – Sustainable Development Goals, catastrophic health spending, financial protection, Universal Health Coverage.

**Analysis of Development Expenditure and Its Impact on Socio Economic Development of the Region.**

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**Abstract**

**Purpose** – The paper provides a comprehensive analysis of Development Expenditure of Punjab and its impact on the social and economic development of the province.

**Design/ Methodology/ approach** – Development Expenditure of the past 3 years was analyzed sector wise and district wise and correlations were run with various variables to determine its impact.

**Findings** – The paper confirms that Development Expenditure has a significant impact on the social and economic development of the province and that it is a key component to enhance economic growth.

**Research limitations/implications** – The research was a desk research and researcher could not physically go to places to determine social development of the area

**Practical Implications** – Development Expenditure must be allocated based on economic potential of the region.

**Social Implications** – The paper proves that Development Expenditure is a crucial component to attain social development in a region and achieve SDGs.

**Originality/value** – The paper concludes that for a country to achieve sustainable socio economic growth, the development expenditure needs to be allocated based on economic potential of the region.

**Keywords** – Socio economic development, economic growth, public sector investments, Development spending, Resource allocation.

# The Contributions of the Board of Directors, Gender Diversity and Board Committees on Firm Financial Performance in Nigeria.

**Aliyu Aminu Baba[1,a], Yahaya Danjuma[1], and Ahmad Sule Liman-Katagum[1]**

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**Abstract**

**Purpose** – This paper examine the effects of board of directors, gender diversity and boards committee on firm financial performance. The paper investigates the relationship between women directors on the board and important board committees on financial performance measured as return on assets (ROA) and earning per share (EPS).

**Design/methodology/approach** – The study has adopted scientific mode of analysis through quantitative, secondary data was collected from 18 commercial banks starter was equally used as a tool for the analysis in testing the cause and effect relationship among the variables under investigation

**Findings** – The findings of the study indicates that banks with higher number of females directors on board and board committees have higher earnings per share (EPS)) and return on assets (ROA), evidences imply that decisions concerning the appointment of women to corporate boards should be on criteria of increasing financial performance.

**Research limitations/implications** – Future research could use the results of this study as a basis for enhanced and improvement financial performance and board effectiveness by having more female directors on it corporate board. It is limited in data collecting as it studied eighteen (18) Commercial Banks only.

**Practical implications** – These studies enhanced the previous studies on board of director's gender diversity, board committees and its impacts on firm financial performance, the results could be used to improve studies on board gender diversity evidence from developing countries.

**Social implications** – The result of the study would improve women participation on management of corporate organization for effective financial performance in terms of earnings per share (EPS) and return on assets (ROA).

**Originality/value** – The investigated setting is unique and contributes several findings on board gender diversity and financial performance with rear in developing African Countries.

**Keywords** – Board, Diversity, Financial Performance, Corporate Governance.

**Military Armoured Vehicle Procurement and Its Impact on Employment Creation.**

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**Abstract**
The main objective of this research is to investigate the impact of the military armoured vehicle procurement on employment creation in Malaysia. The specific research objectives are: (a) to determine the level of employment creation and the quality of employment, (b) to determine the relationship between selected demographic profiles (educational attainment, level of income, level of skill, age group and gender) and quality of employment, (c) to determine main effect of vendor types, firm sizes and vehicle types on quality of employment and (d) to determine the interaction effect of vendor types, firm sizes and vehicle types on quality of employment. The research methods design for this study employs both expo-facto and correlational descriptive research. The data for this study will be collected using a self-administered questionnaire and from secondary sources.

**Keywords** – military armoured vehicle procurement, impact, quality of employment.

**The J-curve Dynamics and Asymmetric Effect of Exchange Rate Changes on Trade Balance: Evidence from Nigeria.**

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**Abstract**

**Purpose** – The purpose of this paper is to investigate the effect exchange rate changes on trade balance.

**Design/methodology/approach** – This paper uses time series aggregate trade data from World Development Index (exports trade volume and imports trade volume) to investigate the evidence of J-curve phenomenon in Nigeria trade balance model following Pesaran and Shin (2001) bounds testing approach for cointegrating relationship and error correction model.

**Findings** – Findings from the bounds testing approach for cointegration and error correction model revealed evidence of short-run and long-run relationship between real exchange rate changes and trade balances in Nigeria. However, the results showed strong support for Marshall-Lerner conditions on trade balance an evidence of J-curve phenomenon.

**Research limitations/implications** – The models are estimated using the ratio of imports trade volume and exports trade volume of Nigeria against the rest of the World.

**Originality/value** – This paper is the first to investigate short-run and long-run effect of exchange rate changes on trade balance in Nigeria using NARDL.

**Keywords** – Exchange rate changes, J-curve, Trade balance, ARDL, NARDL, Nigeria.

**_Mytella charruana_: A New, Invasive bivalve in Tebrau Strait.**

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**Abstract**

**Purpose** – This study reports the presence of the Charru mussel *Mytella charruana* d'Orbignyi, 1846 (Bivalvia: Mytilidae) in Tebrau Strait, Johor, Malaysia. In April 2016, mussels previously identified as kupang hitam or black mussel were reported in east and west of Tebrau Strait. In August 2016 it has begun to spread to the mussel's smart line farm in the Teluk Jawa, Masai. It is estimated that the percentage of domination of *M. charruana* in the smart line system at that time is up to 50% of the total system available.

**Design/methodology/approach** – Samples of ~50 mussels were preserved in 90% ethanol and sent to Penang for genetic evaluation using amplified mtDNA sequences coding for cytochrome oxidase 1 (mtCO1) using universal LCO and HCO primers, and then sequenced with HCO primers. *Brachidontes pharaonis, Modiulus modulaides, Arcuatula senhousia, Chthamalus malayensis* and *Perna viridis* are the closest cladistic outgroups to the Mytella phylogeny, with the latter showing the closest sequences. Comparison was made to sequences from deSouza et al. (2015) of two divergent sequences of female mtCO1 lineages in Mytella that are distinct from another divergent male lineage using *M. brasiliensis* as the outgroup.

**Findings** – Using Basic Local Alignment Search Tool (BLAST), there is a 100% identity match over ~510 bases to Haplotype H46 of *Mytella charruana*, with a native range on the Pacific coast of the Americas from Guaymas, Mexico to Ecuador.

**Social implications** – There is potential of this new species to become invasive and competitive with native *Perna viridis* (Linnaeus, 1758).

**Originality/value** – this paper represents the first record of *Mytella charruana in Tebrau Strait*.

**Keywords** – marine non-native species, invasive mussels, biological invasion, cytochrome oxidase subunit 1, harbours.

## Sustainable Lifestyle and Zero Carbon Transportation via Active Mobility in Campus

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**Abstract**

**Purpose** – The aim of this project is to promote the reduction of carbon monoxide emission in Universiti Sains Malaysia (USM) campus through encouraging the sustainable lifestyle among USM communities by using zero carbon transportation via active mobility. The mode of transportation by the mean of active mobility here is by using bicycle and e-scooter. It is a sustainable transportation system where bicycles and e-scooters are made available for shared use for individuals on a short-term basis for a fixed price. It is a non-motorized transportation service which is usually meant for short trips. An active mobility-sharing system has received increasing attention in recent years with an initiative to meet the demand of more mobile public and to lessen the environmental impacts of our transportation activities.

**Design/methodology/approach** – The station of active mobility (bicycle, e-bicycle, & e-scooter) will be located around the strategic and hotspot areas near lecture halls, hostels, cafeterias, and departments (PTJs) in the main campus USM. By using the mobile Apps, the rider of this active mobility is enable to unlock the bike, e-bike or e-scooter for his/her own riding with a minimum charge for this service. When the rider reached his/her destination, the rider needs to park the vehicle at the designed parking station and only then can lock it. This research studies the feasibility of implementing an active mobility-sharing system in USM. A study conducted by Washington University reported a faster on-campus travel and an obvious step towards a greener and healthier campus after the implementation of active-mobility sharing system.

**Findings** – The USM communities, USM staff or even students, will have the opportunity to move from one place to others via using active mobility instead of using own vehicle, bus, or even e-hailing car service (like Grab). This mode of transportation will not only provide easy and convenient riding to the destination but will also reduce carbon emission in this green campus environment.

**Practical implications** – This project also: i) encourage a healthy lifestyle among USM communities via active mobility like cycling & walking; ii) reduce the carbon emission by using zero carbon transportation via active mobility; iii) provide accessibility, availability, affordability and flexibility mode of transportation among USM communities.

**Keywords** – active mobility, sustainable, healthy lifestyle, carbon, transportation.

**Implementation of Project Based Learning Method in Teaching English at MICE Study Program Polteknik Negeri Medan (Polmed-Indonesia).**

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**Abstract**

**Purpose** – The purpose of this study is to implemen project based learning in detail teaching English at MICE Study Program. MICE is abbreviated of Meeting Incentive Convention and Exhibition. This research is based on the experiences to acquire sustainability of MICE study Program and relevance to theme written in 'RPS' Rencana Pembelajaran Semester' in Semester 1 and 2 (Planning of Learning Semester in MICE Study Program).

**Design/methodology/approach** – The authors conducted qualitative analysis by using a method of 'PBL' Project Based Learning in teaching English. This method is suitable to be applied for MICE Tourism Study Program in achieving of Speaking English fluently.

**Findings –** The writer considers to find utterances spoken by students during English Project Work in producing any piece of language to achieve fluency in speaking English freely in the prospect they work as Liasion Officer and handle Registration Form to join National and International Event.

**Research limitations/implications** – The implication of this research is english project work. The limitation of this research is the project basd learning method and any piece of language produced during the english project work.

**Practical implications** – Improve basic and intermediate English utterances to communicate in english with people from different cultural background.

**Social implications** – MICE Students Spoken English will be improved well and the uttturancec of language wil be qualified.

**Originality/value** – The implication of PBL Method applied at MICE study program has benefit to Tourism Industry in involving MICE Human resources in creating innovative English Events.

**Keywords** – Politeknik Negeri Medan, Project Based Learning Method, MICE (Meeting Incentive, Convention and Exhibition), RPS (Rencana Pembelajaran Semester)

# Role of Data Mining Models in Environmental Sustainability: Case of Groundwater Exploration Management using Geoscience Derived Parameters.

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**Abstract**
**Purpose** – This paper aims to establish the efficacy of data mining models in natural resources management, a key component in environmental sustainability.
**Design/methodology/approach** – The authors applied diverse data mining techniques to geoscience data derived parameters towards quantity and quality checking assessment of groundwater resources management programs. Investigation of data mining approaches of evidential belief function (EBF) and analytical hierarchical process (AHP) were examined for groundwater potentiality (quantity) evaluation. Subsequently, the synthesizing algorithms of DRASTIC and OWA-DRASTIC methods were assessed for groundwater vulnerability (quality) monitoring. The study was carried out in Perak Province, Malaysia. Six groundwater potentiality conditioning factors (GPCFs) including aquifer layer thickness; aquifer layer resistivity; overburden material resistivity; overburden material thickness; hydraulic conductivity; transmissivity and seven pollution potential conditioning factors (PPCFs) namely: water table depth; recharge rate; aquifer media; soil media; topography; impact of vadose zone; hydraulic conductivity were considered. Using these conditioning factors as input to the data mining models' algorithms, groundwater potential index (GWPI) maps and groundwater vulnerability to pollution index (GVPI) maps were produced.
**Findings** – The ROC validation of EBF and AHP models' produced maps using ratio 70:30 of the occupied 28 borehole wells was considered for these models prediction capability evaluation. The analyzed groundwater quality data results were used for the DRASTIC and OWA-DRASTIC method's prediction accuracy assessment. The ROC results established the success rate and prediction rate of 88 % and 89 % and 53 % and 68 % for the EBF and AHP, respectively. The precision evaluation of the DRASTIC and OWA-DRASTIC methods revealed 64.29% and 85.71%, respectively.
**Research limitations/implications** – The case study used is limited to Asian country. Future research could consider exploring data from other continents.
**Practical implications** – In improving environmental sustainability particularly in the field of natural/mineral resources management, the need to invest on developing specific data mining methodology that can assist in managing conflictual information and different levels of uncertainties and inaccuracies from different investigation methods is a welcome task.
**Originality/value** – With these results, the proficiency of data mining models in environmental sustainability has been proved. Thus, through re-engineering exploit of data mining models, the threatening of global water security crises can be salvaged.
**Keywords** – Geophysical, groundwater, data mining, AHP, EBF, DRASTIC, Vulnerability.

**Riverine Communities Livelihood Strategies in Sadong Jaya, Sarawak, Malaysia.**

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**Abstract**

**Purpose** – This paper focuses on the availability and accessibility of capital assets among the Sadong Jaya communities and how the communities use these capitals to sustain their livelihoods.

**Design/ Methodology/ Approach** – Livelihood strategies of the riverine communities at Sadong Jaya, Sarawak is described using a sustainable livelihood approach. Five villages in Sadong Jaya were selected using purposive sampling method. Data is collected using in-depth interviews with the key informants including the District Officer besides Focus Group Discussions (FGDs) with the community leaders.

**Findings** – Preliminary findings indicated that communities in Sadong Jaya at lower Batang Sadong are rich in natural capital but lacking in physical capital. As they wer e vulnerable to flood, soil erosion and migration of their youth to urban centres, the communities chose to diversify their economic activities as part of the strategies to overcome these vulnerabilities. As most of the crops and river catches are for self-consumption, those who own lands diversify their livelihood by converting their land into cash crops cultivation like oil palm plantations.

**Research limitations/implications** – The findings of this paper focuses on the discussion based on selected villages and with a small group of people which do not generalize the situation in Sadong Jaya.

**Practical implications** – The paper provides policy recommendations to enhance the livelihood of the riverine communities through livelihood diversification.

**Originality/value** – This paper helps to identify the vulnerabilities and constraints experienced by the riverine communities at Sadong Jaya. The findings also include information of the current livelihoods, accessibility and availability of assets.

**Keywords** – Sustainable Livelihood, Vulnerability, Livelihood Assets, Batang Sadong.

**Connecting the Local Communities in Telok Melano, Sarawak.**

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**Abstract**

**Purpose** – This study aims to examine the socio-economic impact of the construction of Pan Borneo Highway to the local communities in Telok Melano.

**Design/methodology/approach** – This study adopts a qualitative approach. Focus group discussion and face-to-face interviews with the local communities were carried out before conducting content analysis of the information collected.

**Findings** – The villagers of Telok Melano have diversified their livelihood strategies by capitalising its unique location of being closest to the national park to participate more actively in tourism activities after the Pan Borneo Road construction. The villagers managed to earn better cash income by tapping its natural capital.

**Research limitations/implications** – As the impact of infrastructure development is an on-going process, the dynamic nature of the progression of this impact should be captured in future studies so that comparison can be made between immediate and long-term impacts of road connection.

**Practical implications** – The results could be used to improve the current planning of spatial connectivity through road construction in rural area.

**Social implications** – The socio-economic implications of the Pan Borneo Highway construction can be used to strengthen future planning of spatial connection to the rural area.

**Originality/value** – The investigated setting is unique to the local socio-cultural context and the findings of this study would provide new insights for better understanding on the impact of completion of the first part of Pan Borneo Highway which was officially open to the public early 2019.

**Keywords** – Sustainability, Pan Borneo Highway, Telok Melano, Connectivity.

## Factors Determining Attitude and Behaviour of Higher Education Institution's (HEI's) Community to Practice Reduce, Reuse, and Recycle (3R) in the Campus.

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**Abstract**

**Purpose** – This research aims to identify the factors that influence attitude and behavior of the Higher Education Institution's (HEI's) community towards the implementation of 3R in the campus.

**Design/methodology/approach** – This is the preliminary phase of research which aims to review literatures from the secondary data available in various sources. This stage is to propose a behavioural theory model which will be explained in the form of descriptive analysis. It will guide in the development of questionnaire items in the next phase of research.

**Findings** – Previous studies show that there are many factors influencing pro-environmental behavior of an individual. The factors has been significantly proven through behavioral theories such as Theory of Planned Behaviour (TPB), Norm Activation Model (NAM), and Environmentally Responsible Behaviour Theory (ERB). Some researcher has integrated these theories or has extended the theory to be more comprehensive according to their scope of research.

**Research implications** – The identification of factors influencing 3R attitude and behavior is to fulfil the target in 11th Malaysia Plan which is to achieve 20% of recycling rate in 2020.

**Originality/value** – This research found that the integration of theories make the model become more comprehensive. The model will help the universities to initiate effective plans towards 3R besides to shape a first class mind among the HEI's community.

**Keywords** – Sustainable Campus, Sustainability, 3R, TPB, NAM, ERB.

**Mapping Cultural Ecosystem Services of Taiping Lake Garden.**

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**Abstract**

**Purpose** – The purpose of this study is to determine distribution of spaces that provide cultural values to the urban green-blue space users.

**Design/methodology/approach** – The study was conducted at Taiping Lake Garden and used visitor employed photography. Public perception of the park are derived from photographs taken by invited visitors. 33 visitors visited the park and provided 584 photographs that represent their real-time and on-site visiting experience. The locations were recorded and analyzed using ArcGIS and the photos were weighted based on nine subcomponents of cultural ecosystem services.

**Findings** – In general the photographs mainly concentrate around the Peace Park, Lotus Pond, Rock Garden, Raintrees and Ride and Cruise (boat ride). The ANN for subcomponents illustrate that locations are dispersed for all nine subcomponents. Recreational and social interaction subcomponents are two highest score, while identity and sense of belonging scored the least.

**Research limitations/implications** – Future research could use the results of this study as a basis for investigating factors that influence cultural ecosystem benefits.

**Practical implications** – Locations and spaces that provide identity and sense of belonging among park visitors provide crucial information for researchers and urban managers to improve visiting experience.

**Social implications** – The study create a process for stewardship of urban green spaces among park visitors.

**Originality/value** – Taiping Lake Garden is one of the country's natural heritage sites and the findings indicate it is more valued for its recreational and social interaction benefits than identity and sense of belonging by the visitors.

**Keywords** – Urban Ecosystems, Sustainable Cities, Urban Green-Blue Spaces.

**Pollutant Source Investigation Affecting Water Quality in Sungai Pinang.**

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**Abstract**

Sg Pinang is one of the main river basins in Penang with the downstream zone passing through the urban area of Georgetown. Sg Pinang was once classified as Class V River until the river water quality is improved to Class III due to the wastewater treatment installation at an abattoir in 2010. However, pollution issues in Sungai Pinang is still significant due to the garbage dumped into the river, pollution from heavy metals and hazardous chemicals from industries, and wastewater discharge from homes along the river. It is important to address this issue as it is one of the sustainable development goal (SDG6) of the United Nation, where availability and water management should be sustained. Several other efforts have been made to revive Sungai Pinang including using iQPR technology to clean the river water and Sungai Pinang River Care Programme to enhance community participation in river protection and river rehabilitation. However, there have been challenges to commit to these rehabilitation and revival efforts. Some of the challenges are low public participation and perception towards environmental sustainability, lack of enforcement, continuation of solid waste and rubbish disposal by public, filthy drains and rivers leading to Sungai Pinang and the exorbitant cost of water quality treatment via iQPR technology. To rehabilitate Sungai Pinang, important aspects such as solid waste management, a more effective community engagement projects, water course restoration (e.g. point source pollution control and treatment at primary source), and installation of more efficient urban drainage system need to be implemented. Aside from that, it is also important to implement river engineering and urban design strategy in construction industry along Sungai Pinang. Policy makers, experts and surrounding community need to work together to improve the ecosystem of Sungai Pinang.

**Keywords** – Sg. Pinang, water quality, water security, river conservation, sustainability, water quality assessment.

**Economic Growth, Energy Consumption and Carbon Emissions in Nigeria: The Implication of Urbanization in Sustainable Development.**

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**Abstract**
This paper examines the relationship among urbanization, economic growth, energy consumption and carbon (CO2) emissions and tests for the validity of Environmental Kuznets Curve (EKC) hypothesis in Nigeria, for the periods of 190 to 2014. The paper employs Autoregressive Distributed Lag (ARDL) bound testing approach to estimate the short-run and long-run relationships among the variables. The estimated results reveal that urbanization, economic growth and energy consumption have significant impacts on CO2 emissions in the long-run. While energy consumption appears to be the only variable that has significant impact on CO2 emissions in the short-run. Also, the results confirm an N-shaped EKC for Nigeria. The paper concludes that urbanization and energy consumption are major contributor to CO2 emissions in Nigeria, and therefore recommends the establishment of efficient and sustainable urban energy infrastructure to control the growth of emissions in urban areas. The paper also recommends a paradigm shift from current source of energy to other low-carbon energy sources that are relatively free from CO2 emissions and that Nigeria should look beyond the EKC notion that economic growth is a solution to environmental pollution.

**Keywords** – Urbanization, energy consumption, economic growth, carbon emissions.

# Measuring the Level of Awareness, Knowledge, and Attitude on Environmental Sustainability Amongst Higher Education Youths in Penang, Malaysia.

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**Abstract**

**Purpose** – Higher education play an important role to meet the sustainability challenges in time with the global trend on Sustainable Development Goals (SDGs) 2030 Agenda. In securing the successful of achieving the implementation of the 2030 Agenda, youth plays a vital role as our future generation and leader. This study aims to determine the level of awareness, knowledge and attitude concerning environmental sustainability amongst the youths in higher education institutions (HEIs). This study looks at the different level of attitude on environmental sustainability between genders and tests the hypothesis that awareness and knowledge on environmental sustainability lead to positive attitudes.

**Design/methodology/approach** – A survey was conducted using a cluster sampling method at selected six HEIs in the state of Penang, Malaysia. The respondents (i.e., youths) were chosen randomly from each selected location and HEI. The collected data were then analysed statistically using the IBM (SPSS) Statistics version 22 software.

**Findings** – The data illustrate that the respondents have a high level of awareness, knowledge and attitude regarding environmental sustainability. Moreover, there is also a significant difference regarding attitude between genders towards environmental sustainability. Besides that, the awareness and knowledge also have a significant combined effect on attitude amongst higher education youths.

**Practical implications** – The findings could be used to support the Education for Sustainable Development (ESD) programmes in order to empower the youths and maximise the effectiveness of sustainability amongst youth.

**Originality/value** – The study finds that HEIs in Malaysia should participate and create more creative and impactful programmes that can involve and attract more youths to participate and equally promote environmental sustainability.

## Carrot and Stick Approach to Influence Value Added Tax (VAT) Compliance Behaviour in Developing Countries.

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**Abstract**

**Purpose** – Value Added Tax (VAT) was introduced to increase the revenue base of the government and make funds available for the developmental purposes so as to improve the growth and development of a country. Despite its importance, the compliance rate in developing countries as compared to developed countries is low. Thus, this paper explores from previous studies conducted in developed and developing countries on the role and importance of blending the carrot with the stick approach to influence the VAT compliance behaviour in developing countries.

**Methodology** – Fairness in the tax system and tax incentives were discussed as the carrot approach, while detection probability and penalty magnitude as the stick approach to the non-compliant group that perceives evasion as an escape route to beat the VAT system.

**Findings** – Based on the previous studies conducted, results indicate that there is positive relationship between fairness in the tax system, tax incentive, detection probability and penalty magnitude with VAT compliance behaviour in developing countries.

**Implications** – This paper will go a long way to assist developing countries in formulating policies on strategies to improve on VAT compliance as well as increase their revenue generation, particularly in this period of unstable revenue from oil. Furthermore, empirical studies should be conducted to test the consistency of the results.

# The *Vertical Verandah*: Towards a Sustainable Social Space in Multi-storey Residential in Malaysia.

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**Abstract**

**Purpose** – This study aims to explore and analyze the effectiveness of Verandahs in Malaysian multi-storey residential and ascertain possible architectural interventions to restore its intended function as a social communal space.

**Design/methodology/approach** – The study used quantitative and qualitative approaches. Quantitative data was collected using structured survey questionnaire from residents of multistory residents. Qualitative data (interview) was collected to assess the personal experiences of occupants to investigate factors that contribute towards the ineffective use of a verandah. Both collected data provided validation for each other and form a solid basis for drawing conclusions.

**Findings** – The study evidenced that verandah has not been effectively used as its intended social function. Majority of the residents reported that they use verandah as storage and mostly spend time indoors due to outdoor weather induced conditions. A significant percentage of residents reported would choose to frequently use the verandah if the space is more effective in size and environmentally.

**Research limitations/implications** – As the research is narrowed down to focus only on verandah at multistory residential, some limitations have become apparent. For instance, the analysis and targeted typology was only applicable for residential with verandah with disregard to corporate towers and mixed used residential, which combines commercial.

**Practical implications** – Designers must ensure verandahs provided in multistory residential are conducive in order to be a socially and environmentally sustainable space as it would enhance value for the rapid ongoing multi-story residential developments in Malaysia.

**Social implications** – Architectural interventions in climate control and effective size can improve the function of verandah as social space.

**Originality/value** – The study concludes that designers should design verandahs that are conducive socially and environmentally effective as to ensure sustainable use of the space.

**Keywords** – verandah, social communal, vernacular, multi-storey residential.

**Petaling Jaya City Council (MBPJ)**
**Assessment Tax Rebate Scheme for House Owners.**

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**Abstract**

**Purpose** – The purpose of this paper is to showcase the steps taken and results achieved by a Malaysian City Council in its efforts to mobilise its citizens to adopt sustainable living practices in line with the Low Carbon City Framework (LCCF).

**Design/methodology/approach** – The use of data from application forms and actual results extracted from nearly 1,000 participants between 2011 and 2018.

**Findings** – The Petaling Jaya City Council has proven that citizens can be persuaded to take (simple) initial steps towards achieving a sustainable lifestyle.

**Research limitations/implications** – This pilot project in the State of Selangor shows that urban Malaysians are ready to adopt sustainability actions.

**Practical implications** – The results could be used to replicate this initiative in process other Local Authorities within the state as well as throughout the country.

**Social implications** – The adoption of sustainable living practices in Petaling Jaya shows that citizens of a developing country are prepared to tackle the challenges of SDGs.

**Originality/value** – This effort was the first of its kind in ASIA, and still remains the ONLY one in Malaysia.

**Keywords** – Sustainability, Energy, Water, Waste, Transport, Bio-diversity.

**Eco-University Policy and Implementation of Mahidol University, Thailand.**

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**Abstract**

Mahidol University (MU) has been living a long history for over 129 years, which is recognized as a large higher education institution comprising of academicians and professionals in every field, both in arts and sciences. Salaya campus is the main campus of MU, where is located in Nakorn Pathom province, west of Bangkok, Thailand. MU has driven the eco-university policy for sustainable development on campus and in the surrounding community by creating a balance of economic, social and environmental dimensions which will lead to efficient use of resources, social equality and improved quality of life of staff, students and the surrounding community. The university aims to reduce greenhouse gases by at least no less than 25% within the year 2021 in comparison with gas emissions of the base year 2016. This plan complies with Thailand policies in accordance with its ratification of Paris Agreement in reducing greenhouse gases by no less than 20-25%. To achieve this goal, the university has adopted three strategies including 1) Promotion of an increase in resource efficiency; 2) Promotion of low carbon technology and innovation to reduce greenhouse gases; and 3) Promotion of community engagement.

**Keywords** – Eco-University, Green campus, Greenhouse gas, Resource efficiency, Community engagement.

# University of Malaya Campus Sustainability Transformation and Transition As Living Lab.

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**Abstract**
**Purpose** – The purpose of this study is to elaborate on how university fosters applied research and education by using the campus as a 'living lab' (LL) to test real-time sustainability solutions, offering opportunities to turn theories into practice, and enabling students and staff to achieve greater engagement with a more holistic experience.
**Design/methodology/approach** – The authors conducted content analysis by using qualitative approach based on Living Lab Triangle Conceptual Framework and inductive analysis. This study analyzed the details of the data to discover important patterns, themes, and inter- relationships; begins by exploring, then confirming findings, guided by analytical principles based on Living Lab Triangle Conceptual Framework.
**Findings** – The study confirmed that various factors such as top management buy-in, the crucial role of research and education, integration between research and operations, stakeholders engagement, adoption of guiding policies and action plans, were positively contribute to strategic implementation of innovations and best practices on the ground pertaining to campus sustainability performance. The study shows that the introduction of LL by University of Malaya (UM) exemplify a viable model in translating in-house research and academic outputs into both tangible and intangible for the benefits of campus community. UM achievements in various sustainability assessments provide important indicators for campus community to reflect upon way-forward on resources optimization without compromising the university's productivity and performance over the years.
**Research limitations/implications** – The case study used is University of Malaya in Kuala Lumpur, Malaysia. The implications are relevant for public universities in Malaysia. Future research could use the results of this study as a basis for exploring other perspectives such as top management and campus community perceptions, technological application, Sustainable Development Goals (SDGs) mapping and data management.
**Practical implications** – The results could be used to improve integration and adoption of campus sustainability initiatives in order to encourage more HEIs to contribute towards minimizing harmful environmental burden especially by decreasing the amount of carbon emission.
**Social implications** – Living Labs concept entails beyond environmental implications. Practical outputs both tangible and intangible can assist stakeholders of an organization in the case of campus management and operations as part of the beneficiaries of the campus sustainability initiatives.
**Originality/value** – The study concludes that Higher Education Institutions (HEIs) both public and private should work more collaboratively with stakeholders by exploring and adopting campus sustainability initiatives which align and meet with university's exclusive setting, capacity and priorities. Campus sustainability transition require both short-term and long-term commitments. Hence, UM Living Labs model is one of the pioneer and viable platforms in the case of universities in Malaysia that introduced the successful integration of research, education, and operation. This endeavor is supported by campus-wide participation and contribution guided by concerted guiding principles.
**Keywords** – campus, sustainability, living labs, translational, transition.

## Lessons Learned During Designing In-Service Teacher Training for ESD in Okayama: Formulating Communities of Practice through Collaboration among Multiple Stakeholders.

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**Abstract**

**Purpose** – This study aimed to clarify essential perspectives and structural features for developing in-service teacher training programs in education for sustainable development (ESD).

**Methodology** – The author conducted action research, actively participating as one of the coordinators for the ESD consortium.

**Findings** – In-service schoolteachers' sustainability literacy can be raised and their autonomy as change agents developed in three dynamically linked phases: (1) learning about sustainability and its connection to their educational philosophy; (2) sharing their interests and inquiries about sustainability and its relevance to students' education and development with the community; and (3) implementing collaboratively designed ESD programs.

**Research limitations/implications** – The study results provide a framework for developing teacher competencies and methodologies for both ESD teacher training and future research.

**Practical implications** – The results can improve the current ESD teacher curriculum, including in-service teacher training.

**Social implications** – To achieve a sustainable society, teacher educational institutions need a flexible system to support teachers' professional development as reflective practitioners of ESD, as well as ongoing training programs with collaborative processes.

**Originality/value** – The research was conducted at a unique setting, the Regional Centre of Expertise (RCE) Okayama, site of the world's largest number of UNESCO-associated schools officially accredited for promoting ESD.

**Keywords** – ESD, teacher education, sustainability, communities of practice, transformative learning.

**Informal Education as a Strategic University-School Partnership in Enhancing the Quality of Education: Reflections and Lessons Learned.**

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**Abstract**
Partnership between schools and universities is vital for advancing the SDG 4- Education 2030 Agenda. This paper outlines the process developed by RCE Penang to initiate informal education as a strategic entry point for university-school partnerships in enhancing the quality of education. This paper will discuss the strategies performed by RCE Penang and describes its relationships with the various stakeholders to promote informal education in schools, by means of projects and action-based initiatives, synergies between RCE and agencies based at the local level.

**Keywords** – ESD, SDG4, informal education, RCE Penang.

# Communicating Environment Sustainability: Shifting the Perspective from Logic to Emotion.

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**Abstract**

**Issue** – As human exceptionalism further divides the man-nature bond, it is time that the present generation strives to nurture the relationship that would prove vital in contributing to the saving of the planet.

**Aim** – This study attempts to assess the need to develop the emotional faculty among humans towards the natural environment which could contribute to the sustainability effort. In comparison to nurturing pro-environmental behaviour approached from a logical perspective, this study evaluates if the emotional inclination which regards the natural environment compassionately would contribute to how the natural environment is perceived by humans, thus contributing further to the sustenance of nature.

**Target** – The study will seek from individuals representing environmental and sustainability related NGOs of which these individuals would be able to feedback on the logical and emotional perspectives based on their experience in nurturing positive environmental behaviour.

**Significance of the study** – As it cannot be denied that communication on environmental sustainability had focused much on the logical faculty, the conveyance of the message of environmental sustainability could consider a more humane approach which not only relies on scientific data, verification and justification, but one that taps into developing the human-nature bondage. The findings of this study should be given a serious thought in strengthening the human-nature bond from an emotional perspective in facilitating attitude change among humans towards the natural environment, in the hope of nurturing environmentally responsible behaviour among the generations to come.

**Keywords** – Emotion, Environment, Human, Logic, Nature, Sustainability.
**Paper type** – Research.
**Scope** – Environment education social responsibility.

# The Role of Audit on Quality Service Delivery of Tertiary Institutions in Nigeria: A Panacea for Sustainable Development.

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**Abstract**

**Purpose** – The purpose of this study is to examine the role of audit on quality service delivery of tertiary institutions for sustainable development in Nigeria, despite the provision of funds by government through budgetary allocation and the revenue generated internally by the various tertiary institutions in Nigeria yet their performance was below standard as a results of the diversion of fund and misplacement of priority by political office holders and government officials due to improper or lack of auditing practice.

**Design/methodology/approach** – The study adopted quantitative approach, data was collected from 120 respondents using questionnaire, sample was drawn through systematic random sampling and Chi-Square was used as a tool for the analysis.

**Findings** – The findings indicate that service delivery was poor and the study establish that a positive relationship exist between auditing and quality service delivery of public tertiary institutions.

**Research limitations/implications** – The results of this study could be use to enhance the quality of service delivery of public tertiary institutions and future researchers could use the results of this study as an additional literature on auditing and quality service delivery, it would as well serve as a basis for reference.

**Practical implications** – The results could be use to improve the quality of service delivery in public tertiary institution and as well improve the quality of education in Nigeria.

**Social implications** – The result would improve the behavior and the activities of all stakeholders in tertiary institutions, the general public and the country at large.

**Originality/value** – The study is unique and contributes several findings that explained the role of audit on quality service delivery as it affects public tertiary institution in Nigeria.

**Keywords** – Audit, Quality Service Delivery, Tertiary Institution.

**Towards a Malaysian Model of University:**
**IIUM Journey of Humanising Education through Maqasid Shariah and Sustainable Development Goal.**

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**Abstract**
The continuous change in higher education landscape has forced universities to respond with diverse model of university. Despite of a more demanding need for a contextualised model, the predominant force of neoliberalism still significantly influences and shapes the outcome. Against this trend, IIUM has embarked on a journey to showcase a Malaysian model of university that address Sustainable Development issues using Maqasid Syariah as its foundation. The model hopes to change the university ecosystem by pushing the agenda of university serving the community together with other stakeholders of the quadruple helix network. Towards achieving this mission, IIUM has outlined a number of transdisciplinary flagships project to address the three aspect of sustainable development issues - environment, economics and social. Among the flagships program to drive the agenda are Gombak Heritage and Cultural Living Lab, IIUM Low Carbon Campus, River of Life and Jungle School Gombak.
**Purpose** – to provide an example of an integrated model of a university in addressing sustainable development issue.
**Design/Methodology/Approach** – Conceptual and Empirical.
**Finding** – Sustainable development issues need to be addressed in a transdisciplinary manner Research Limitations – Time frame of analysis.
**Practical Implication** – workable model of university strategic map.
**Social Implications** – Direct contribution to society Originality/Value – an integration of Maqasid syariah and SDG.
**Keywords** – Maqasid Shariah, Sustainable Development Goal, University Strategic Direction, Humanising Higher Education.

# Sustainability of Smallholders through Corporate Social Responsibility Programs of Palm Oil Companies: Case study of Aceh Province, Indonesia.

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**Abstract**

**Purpose** – This research aims to provide a framework of the mutual benefits enjoyed by both smallholders and Indonesian palm oil companies as a result of corporate social responsibility (CSR) programs in the province of Aceh.

**Methodology approach** – The study uses an explanatory model with a case study approach to specific locations in Aceh Barat and Nagan Raya regencies. The primary data used in this study were obtained from interviews and direct observations of 4 plantations in Nagan Raya and 1 plantation in Aceh Barat. In-depth interviews were conducted with 5 palm oil company managers, 25 smallholders, 2 civil servants at the Department of Agriculture, and 5 village heads.

**Finding** – Smallholders are currently facing the classical issue of lower yields due to a lack of productivity in their plantations.

**Research limitation** – the research focuses on local issue of palm oil smallholder.

**Practical implication** – This study will help the palm oil company's focuses on identifying corporate social responsibility programs which have had a positive impact in improving income standards of smallholders in these two regencies.

**Social implication** – income per capita could improve by implementing CSR program for smallholders.

**Originality** – partnership of palm oil companies and smallholder can increase yield and productivity of local producers of palm oil.

**Keywords** – sustainability of smallholders, palm oil companies, Corporate Social Responsibility programs.

**Life Cycle Assessment and Sustainable Development Goals.**

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**Abstract**

**Purpose** – The purpose of this study is to assess the social sustainability aspects of the Malaysian oil palm industry using Social Life Cycle Assessment (S-LCA).

**Design/methodology/approach** – This study used the S-LCA guidelines developed by United Nations Environment Programme/Society of Environmental Toxicology and Chemistry (UNEP/SETAC) which identifies the social aspects (positive & negative) along the life cycle of products or services. Preliminary study was conducted using six subcategories - fair salary, working hours, health and safety, forced labour, child labour, and social benefits/social security. The system boundary of this study is from nursery, plantation up to palm oil mill. Five companies participated in this study. Data was collected from the companies and workers were also interviewed. The data collected was evaluated using a scale-based approach (1 - Excellent, 2 - Above average, 3 - Average, 4 - Below average and 5- Extremely poor). The performance assessment was created based on international and national laws.

**Findings** – Results ranged between 1 - 3 for all the subcategories. Social benefit/social security scored 1 because most of the companies provide many benefits to their workers. Health and safety as well as child labour scored 2. Most of the companies follow requirements and provide safety facilities, workplace, activities or programme to their workers. For child labour, there is formal policy against child labour in the country and all companies are strictly prohibited to employ children below 18 years old. Fair salary, working hours and forced labour scored 3. Most of the workers received minimum wage as gazetted by the law. Since oil palm is a perennial crop, the workers tend to work more than their normal working hours during high crop seasons which at times exceed the limit. Most of the companies retain foreign workers documents for legality and safety reasons. However, a locker is provided and it is accessible all the time and the handing over of documents is voluntary.

**Research limitations/implications** – Identification of suitable social subcategories specifically for the Malaysian oil palm industry.

Practical implications – To be able to gauge the social implications/impacts of the industry.

**Social implications** – The subcategories should be modified to suit the industry as well as the region. Differentiation on developed and developing countries should be considered.

**Originality/value** – Integrating SDGs with a social impact assessment is crucial; therefore, a comprehensive S-LCA study of the Malaysian oil palm industry is required.

**Keywords** – Sustainability, SDGs, Malaysian oil palm industry, social life cycle assessment.

# Malaria Prophylaxis: Dissolution Enhancement of Atovaquone by Nanotechnology.

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**Abstract**

**Purpose** – This study aims to fabricate amorphous ATQ nanofiber system by electrospinning which can improve the use of ATQ for epidemic malaria prevention.

**Methodology** – Physical characteristics of the samples were tested using Differential Scanning Calorimetry (DSC), X-ray Powder Diffraction (XRPD), Attenuated Total Reflectance-Fourier Transform Infrared (ATR-FTIR), Scanning Electron Microscopy (SEM) and polarized light microscopy. Dissolution studies were carried out in simulated biological fluid.

**Findings** – Image from SEM confirmed the formation of nanofibers. The study from ATR-FTIR showed a uniform distribution of ATQ in the polymer fibre matrix and illustrated peaks with lower intensity and frequency. Data from DSC and XRPD revealed the existence of amorphous form in the ES sample. No birefringence is observed under polarized light microscopy further proved the absence of crystalline structure. The solubility advantage of an amorphous ES sample correlated well to the efficiency of dissolution profile as well as the physical observational changes in the dissolution medium.

**Research Implication** – Future research could use the findings from this study as a basis to formulate ATQ for oral mucosal delivery.

**Practical Implication** – A reduction in dose and side effect of treatment is likely to improve patient compliance.

**Originality** – A fundamental model of the fabrication of amorphous ATQ nanofibers system for drug release improvement.

**Keywords** – Electrospinning, Amorphous, Atovaquone, Dissolution.

**Kanazawa As A Socially-Inclusive Creative City: Lessons For George Town World Heritage Site.**

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**Abstract**

**Purpose** – The purpose of this study is to examine the extent upon which socially-inclusive Creative City strategies and policies that are being adopted in Kanazawa, Japan can be emulated in George Town World Heritage Site, Malaysia.

**Design/methodology/approach** – Through qualitative research approaches, the author conducted fieldwork in both Kanazawa and George Town with the aim to comprehend the strategies/policies adopted by Kanazawa in becoming a socially-inclusive Creative City.

**Findings** – The findings suggest that strong political will as well as the commitment and culture of Kanazawa's citizenry are instrumental towards the city's success as a socially-inclusive Creative City.

**Research limitations/implications** – Future research could use the results of this study as a basis for planning towards a socially-inclusive Creative City for other Malaysian cities.

**Practical implications** – The results could be used to assist urban managers and policy-makers in Malaysian cities to plan towards a socially-inclusive Creative City.

**Social implications** – The level of reporting on the social dimension is high and valuable towards ensuring a city's overall development which in turn enhances the quality of life and well-being of urban dwellers.

**Originality/value** – The investigated settings are unique and contributes significantly towards the advancement of scholarly knowledge in the field of creative cities.

**Keywords** – Creative City, Social Inclusion, George Town, Kanazawa.

**Promoting Inclusive Growth Through Effective Apel (C) Mechanism.**

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**Abstract**

Introduction – APEL for Credit Award [APEL(C)] is the award of credits for the prior experiential learning towards a course in an accredited programme of higher education provider (HEP).

Purpose – The purpose of this study is to promote inclusive growth through effective APEL (C) mechanism; and, to validate its measurement that will affect future research.

Design/methodology/approach – Effectiveness of APEL (C) mechanism was measured through a ten item survey questionnaire, adopting five point Likert scale. Telephone survey method was used to collect 239 usable responses from OUM students. APEL credits were applied between year 2016 to 2018.

Findings – Issues related to data normality (Kurtosis < 3.00) and reliability (Cronbach Alpha = 0.84) were primarily resolved. The CFA indices reported (chi square = 3.84; CFI= 0.85; NFI = 0.81; TLI = 0.76; RMSEA = 0.10) were able to establish the validity of a single factor model. A total of 61% of the respondents remained eligible to sit for the assessment whereas 89% of them requested for more APEL (C) offerings in the university.

Originality/value – APEL mechanism can be capitalised as a transformative agent to reduce social inequality and improve employability by encouraging more people to gain access and credit awards in higher education. In the long run, mobility problems of students can also be reduced if APEL (C) mechanism is able to converge well with Micro-credentials and National Credit Bank System. This paper offers methodological value and novelty to future researchers by validating the instrument through rigorous quantitative procedures.

Keywords – Accreditation of Prior Experiential Learning (APEL), Confirmatory Factor Analysis (CFA) and Open University Malaysia (OUM)

## Stock Assessment Methods of *Decapterus* sp for Sustainable Fishery Management.

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**Abstract**

**Purpose** – The purpose of this study is to determine the stock status of *Decapterus* sp as the target species in Malaysia waters.

**Design/methodology/approach** – The authors conducted content analysis by using using KOBE Plot analysis based on the fishing mortality (F) and Biomass (B) associated with maximum sustainable yield (MSY; i.e. FMSY and BMSY using historical data (2003-2017) taken from statistical data provided by Department of Fisheries, Malaysia and genetic data to determine the stock structure for *Decapterus maruadsi* for South China Sea and Andaman Sea inferred by mitochondrial DNA (mtDNA) Cytochrome *b*.

**Findings** – From KOBE plot analysis shows the current stock status based on maximum sustainable yield (MSY; i.e. $F_{MSY}$ and $B_{MSY}$ using historical data (2003-2017) of *D maruadsi* and the prediction of probability status for the next three years (2020) and 10 years (2027). From genetic analysis, shows that the stock structure among South China Sea was separated between Northern Vietnam waters compared to other areas in the southern part.

**Research limitations/implications** – The outcome from both analysis (stock assessment by using historical data and genetic data) can be promoted for fishery management strategies among fishery managers to come out with sustainable strategic plan for *Decapterus* sp for future.

**Practical implications** – The result for this analysis will reveal the stock structure of *Decapterus maruadsi* and will provide the fishery managers to make a decision among the region with the combination of stock assessment analysis done by KOBE Plot analysis and genetic analysis.

**Originality/value** – The information on current stock of fish resources is the essential point in order to get an effective fisheries management and policy development at the national, regional and global levels.

**Keywords** – *Decapterus* sp, fishery management, stock assessment, sustainable, genetic.

**The Present of Collective Action within the Ancient Sustainable Naturally Flowing Aflaj System in the Sultanate of Oman.**

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**Abstract**

**Purpose** – The aim of this paper is to investigate the present of collective action within a three selected aflaj in the northern part of Oman. These aflaj are popular and hold some of ancient as well as physical characteristics; falaj Daris Nizwa)falaj Lamki (Izki) and Ain Al khasfah (rustaq).

**Design/methodology/approach** – Descriptive method were used to investigate the frequency of the farm size.

**Findings** – The finding of the data for the three falaj is on line with the hypothesis that an even farm size is required in order to hold a collective action with regard to members cooperative.

**Practical implications** – The results is of significant important partly added an empirical finding to the present literature secondly provide the policy make to place more regulation to protect these system from the on going development.

**Originality/value** – The investigation as well as the sampling are unique and will contribute great value of information to researchers.

**Keywords** – aflaj system, collective action, common pool resources.

**Partnerships in Achieving SDGs: Exemplars from SEAMEO RECSAM.**

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**Abstract**

**Purpose** – This paper exemplifies selected blended-mode Training, Research and Development (R&D) programmes initiated by RECSAM in fulfilling SDGs. These programmes are (1) Search for SEAMEO Young Scientists' (SSYS); (2) SEAMEO Basic Education Standards (SEABES) Common Core Regional Learning Standards (CCRLS) in Science and Mathematics; (3) SEAMEO Learning Science and Mathematics Together in a Borderless World [LeSMaT(Borderless)].

**Design/methodology/approach** – Qualitative research design is implemented that included collaborative inquiry involving groups of SEAMEO's educators in series of curriculum development, training workshops/programmes as well as cross-case analysis on the students' investigative projects presented in the most recent congress.

**Findings** – Data analysis revealed that students participated in the 11th SSYS congress were able to present research output in line with SDGs as reflected in set theme. The project SEABES CCRLS in Science and Mathematics aspiring for regional integration and sustainability was anchored on United Nation's SDGs. The e-courses entitled 'The Real World of Immersive Augmented Reality' and 'LearnT-SMArET through championing use of digital tools and e-platforms' [an offshoot programme of LeSMaT(Borderless)] involving collaborative partnerships with various SEAMEO centres also produced numerous output that reflect SDGs.

**Research limitations/implications** – Due to the diverse backgrounds of numerous nationalities, such aspirations would not be achievable without careful planning and smart partnerships involving stakeholders in the region and beyond.

**Practical implications** – More support should be obtained from educational partners and stakeholders to promote investigative research with fundings to participate in SSYS congress as well as ensuring good technological infrastructure and to promote wider participation of blended-mode training courses.

**Social implications** – Apart from fulfulling SEAMEO Education Agenda Priority Areas No.3 (Resiliency in the face of emergencies), No.5 (Revitalising teacher education) and No.7 (Adopting 21st century curriculum) to ensure sustainable living through quality education, exemplars that integrate SDGs were also showcased.

**Originality/value** – SSYS biennially held congress as well as online training courses served as excellent platforms for networking and disseminating of project output that reflect SDGs. This study concludes that more efforts to promote quality education for all considering gender equality supported by technological tools should be continued to reach out to wider audience and raise awareness on SDGs.

**Keywords** – Sustainable Development Goals (SDGs), Partnership, Blended-mode training, Congress, Learning standards, Science and Mathematics Education, Investigative project, Networking.

**Focus Areas** – All SDGs especially No.4 (Quality Education) and No.17 (Partnerships for the Goals)

**Education for Sustainability: Addressing Sustainable Development Goals through Project-Based Learning Approach.**

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**Abstract**

**Purpose** – The purpose of this paper is to showcase an immersive project-based learning (PjBL) platform which enables learners to combine knowledge, skills and innovation to contribute towards sustainable development goals.

**Design/methodology/approach** – Eighteen collaborative learning groups (4-5 learners per group) were formed to develop edible food products by repurpose of food wastes. Each group worked independently from conceptualization of ideas to presentation of final products, alongside consultation with supervisor. Questionnaires were administered to learners before commencement and after completion of the project to assess skills improvement.

**Findings** – This study demonstrated that PjBL approach can serve as an effective platform in education for sustainability. In addition to successful development of food products, learners had the opportunity to immerse into global issues, and heightened their soft skills and value of civic responsibility through their learning experience.

**Research limitations/implications** – The implication is this PjBL approach is transferable and scalable to other disciplines in all higher education institutions (HEIs). Learners developed knowledge and skills that are transferable to their workplace. Learners have also published articles in scientific journals and received awards for some of the products developed.

**Practical implications** – This PjBL approach enabled learners to apply knowledge and skills to implement appropriate and workable solutions to address complex global problems.

**Social implications** – Learners in this PjBL approach take informed and responsible actions to address social and environmental challenges in global systems.

**Originality/value** – This study concludes that current PjBL approach is unique as learners participated in teaching and learning activities that are aligned to sustainable development goals (SDGs).

**Keywords** – Project-Based Learning (PjBL), repurpose, food waste.

# Empirical Evidence Of Community Resilience Elements And Community Response At Banda Aceh Province.

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**Abstract**

**Purpose** – The purpose of this study is to examine four relationships: (1) community attitude and community response; (2) community awareness and community response; (3) community exposure and community response; (4) community perception and community response.

**Design/methodology/approach** – A cross-sectional research design was employed to collect data from local community who lives at Banda Aceh Province (Meuraxa, Jaya Baru, Banda Raya, Baiturrahman, Lueng Bata, Kuta Alam, Kuta Raja, Syiah Kuala and Ulee Kareng) in Aceh, Indonesia. A total of 542 usable questionnaires were returned and analyzed using SmartPLS version 3.5.2 by testing the confirmatory factor analysis and test the research hypotheses.

**Findings** – The results revealed four important findings: community attitude, awareness and exposure are significantly correlated, therefore it's supported. While, community perception is not significantly correlated.

**Research limitations/implications** – This study relevant to local community lives at Banda Aceh Province in Aceh, Indonesia who responding to future disaster.

**Practical implications** – In the context of this study, the majority of community feel that proper planning on community resilience will increase community interest and enhance disaster response.

**Social implications** – This study found out with proper community resilience programme are given more attention, it's may help the community heads to manage their community both individually and groups to enhance better community disaster response.

**Originality/value** – This work deals with community resilience in response phase of disaster situation. This result demonstrates that community resilience is an important determinant of community response in the studied organization.

**Keywords** – Community resilience, Response, Perception, Awareness, Exposure, Attitude.

**Urban Farming as Sustainable Strategy to Revive Interstitials in Community Housing.**

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**Abstract**

**Purpose –** The aim of the study was to investigate the preferences of urban residents to use interstitial housing spaces to encourage urban farming as a means to reconnect people with nature while providing a healthier living.

Design/methodology/approach - Mixed mode research using qualitative and quantitative approach, investigating residents' living in high-rise residents and terraced houses.

**Findings –** the study revealed that i) a large number of urban residents are do not make use of interstitial spaces for growing plant due to the lack interest, space and time and skills. ii) an increase of awareness, establishing policies to promote and support urban farming and architectural intervention such as building orientation and adequate size of interstitial spaces can play an active role to encourage urban farming.

**Research limitations/implications –** This paper focuses mainly on the residential interstitial spaces, the courtyard, the balcony, and front yard/backyard, where urban farming could directly benefit the household members; aesthetically, climatically and psychologically. Further research on the economic incentives of urban farming can be a future topic to address.

**Practical implications –** The results can be used to advice architect and urban residents on the critical role of the interstitial spaces in the urban fabric, and the interventions can support urban farming – in promoting sustainability.

**Social implications –** Possible interventions to increase sustainability of the interstitial spaces can stakeholders socially and economically.

**Originality/value –** This study concludes with possible intervention can improve the effectiveness of the interstitial spaces thus contribute towards a more sustainable space and living.

**Keywords –** Interstitial spaces, urban farming, sustainable living, architectural intervention.

# Socio-spatial Sustainability
# The Dialectic of the City of Kuala Lumpur.

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**Abstract**

**Purpose –** The paper aims to discuss the socio-spatial sustainability, of the city of Kuala Lumpur, as a synergistic relationship between the space (form) and society (content). The city of Kuala Lumpur faces rapid urbanization and is growing into one of the significant metropolitan cities of the South East Asia. Being a highly competitive city in the global market, the city and its conurbations face tremendous change in its structure and land use.

**Design/methodology/approach –** The authors conducted content analysis by using a specific… The Sustainable Design Goal 11 (SDG) proposes ideas to make cities and human settlements inclusive, safe, resilient and sustainable. The paper approaches this goal through land use integrated to an effective network of connectivity. On these lines of thought in order to offer a scientific and systematic approach, the research employs Space Syntax (Hiller, et. al., UCL) software as a tool for urban analysis and Sustainable Street Networks developed by Congress of New Urbanism (2012) as a tool to respond the issues on connectivity.

**Findings –** Firstly, the study is undertaken to understand the spatial logic of the city through Space Syntax software to enlighten on the hierarchy of connectivity of the urban configuration, the streets. Secondly the research is carried out to analyse the areas of high integration values in the Space Syntax Maps to the land use map of the city in order to find social synergy or the functional usage. Lastly the conclusions are drawn on how the Space Syntax maps could be useful to develop the key characteristics for the SDG11.

**Research limitations/implications –** Future research could use the results of this study as a basis for many folds on social sustainability such as effective accessibility of public spaces, safety in the city, public realm, urban design interventions, and the like wise.

**Practical implications –** The paper summarizes a set of attributes that could offer such social synergy and integration between the form and content, which could be considered while revitalizing the city of Kuala Lumpur.

**Social implications –** The recommendations will invariably improvise the socio-spatial sustainability towards effective land uses for the urban communities.

**Originality/value –** The investigated setting is unique and the first attempt in generating Space Syntax map to the city of Kuala Lumpur and the findings therefore offer a new set of knowledge-base to the city planners, urban designers and architects.

**Keywords –** Sustainability, Space Syntax, Connectivity, form and content.

# Vertical Public Realm
# The Application of Urban Theories in Creating Public Domain in High-Rise Buildings.

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**Abstract**

**Purpose –** The purpose of this study is to explore the feasibility of expanding public realm vertically, as an extension to the ground plane activities. The contemporary issue being the lack of public or community realm in the high-rise buildings of the cities in Malaysia. The process of urban intensification is currently happening in major developing Asian cities. As revealed by United Nations, population growth within urban areas in Asia is rapidly increasing and thus, denser cities are needed to create greater efficiency in land use and more sustainable pattern of life. While focusing on creating compact vertical cities, the occupants' activities and the human interfacing with the built form have not been the major priority in the discourse. Therefore, it is essential to ensure the quality of public realm despite increased density within an urban area. The question is; what are the aspects that can be assimilated in designing vertical public realm?

**Design/methodology/approach –** Combination of thematic analysis through a theoretical framework and through a set of case studies where aspects of urban theories contributing to the formation of urban structure and public spaces. Additionally, case studies will be used to examine the thematic framework and discussion on aspects contributing to the design of elevated public spaces will be carried out.

**Findings –** The findings are on the aspects that contribute to the successful design of vertical public realm. It will be devoting to the effort of creating an alternative way of accessing to the public spaces above ground.

Research limitations/implications - Future research could use the results of this study as a basis for developing design principle informing spatial narration in the design of vertical public realm.

**Practical implications –** The results could be used to improve the contemporary literature and design of vertical public realm.

Social implications - The level of reporting on the social dimension could be multi-qualitative such as safety, sense of community, ease of movement and the like-wise.

**Originality/value –** The investigated setting is unique and contributes several findings on the vertical public realm in terms of typologies and alternative ways of accessing the public spaces above ground. It will be benefiting to the urban planners, architects, designers and policy makers in creating sustainable environment for the present and future.

**Keywords –** Urban intensification, vertical cities, elevated public spaces, livability, spatial narration, population growth.

# Architecture Students' Attitude Towards Sustainability and the Use of Digital Simulation.

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**Abstract**

**Purpose –** This study aims to investigate architecture students' attitude towards sustainability through learning of digital simulation and their intention of integrating it to their architecture design studio project.

**Design/methodology/approach –** The study employs a quantitative study using the survey design to 205 participants year two (2) undergraduate architecture students in a private higher educational institution that uses simulation in teaching sustainability. A total of 188 complete questionnaire was analysed using quantitative method of descriptive analysis. Technology Acceptance Model (TAM) was used to understand the factors that influenced students' acceptance. In this study the factor Attitude (ATT) and Behavioral Intention to Use (BI) is discussed in detail.

**Findings –** The results of this study demonstrated positive attitude among undergraduate architecture students that demonstrated positive behavioral intention to use digital simulation in architecture design studio.

**Research limitations/implications –** The sample size came from a private higher educational institution as other institutions did not use digital simulation as part of sustainability teaching in architecture education and it is a self-reported construct.

**Practical implications –** The result can be used to improve sustainability teaching in architectural education, incorporating e-learning /simulation using Building Information Modelling (BIM) and to emphasize integration in studio teaching.

**Originality/value –** The finding discovered that architecture students' sustenance of using digital simulation to create sustainability approach in design studio can only be achieved through constant motivation and clear guidance.

**Keywords –** sustainability; architectural education; attitude; motivation; digital simulation; e-learning; architecture design studio (ADS); Technology Acceptance Model (TAM); Building Information Modelling (BIM).

**Project Team's Benefit in Constructing Green Building in Malaysia.**

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**Abstract**

**Purpose –** This study is to identify the current and available project team's benefit in constructing green building in Malaysia. Green buildings in the built environment is the initiative to achieve sustainability. The results of this study is to determine the positive motivation among construction players that can encourage them to be involved in green building projects thus promoting sustainability in Malaysia. Project team in this study consists of quantity surveyors, architects, engineers, contractors and developers.

**Method –** This study employs a quantitative study using the survey design to 671 participants in construction industry. Population in this research are quantity surveyors, architects, engineers, contractors and developers in Klang Valley. A total of 107 complete questionnaire was analysed using quantitative method of descriptive analysis. The project team's benefit in constructing green building in Malaysia was used to understand the benefit that influenced the team players to be involved in green building projects.

**Findings –** The result can be used to encourage the team players to be involved in green building projects and suggest improvements to the current benefit that would motivate the project team to be involved in green building projects.

**Practical implications –** The results can be used to review the project team's benefits and to make it motivating to encourage green building projects in Malaysia in promoting sustainability.

**Keywords –** Project team, Benefit, Green building, Sustainability.

## The Population Study of Longtail Tuna, *Thunnus tonggol* (Bleeker, 1851) in the South China Sea.

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**Abstract**

**Purpose** - The aims of the study were to identify level of genetic diversity and structure of *Thunnus tonggol* in the South China Sea.

**Design/methodology/approach** – A total of 328 samples from seven sampling locations namely; Muara (Brunei), Sihanouk Ville (Cambodia), Pemangkat (Indonesia), Kuantan and Kota Kinabalu (Malaysia), Trat (Thailand), and Vung Tau (Viet N am). Samples from Semporna (Malaysia) was also collected as an outgroup. The samples were examined by the mitochondrial displacement loop and cytochrome *b*.

**Findings** – The analysis revealed low of nucleotide diversity and high haplotype diversity. Analysis of population differentiation for both markers showed no significant genetic differentiation between the all sampling locations. The phylogeographic analysis also revealed that all samples were homogenous.

Research limitations/implications - Study could not manage to get sample from the Philippine.

**Practical implications** – Realizing that fishing is very important source of income and food for many coastal people in Southeast Asian region a good resource management is fundamental if economic and poverty alleviation is continually achieved.

**Social implications** – It is also known that due to inadequate management measures, fisheries resources in Southeast Asian region has become depleted. Therefore, this opportunity to attain sustainable use for *T. tonggol* is very vital.

Originality/value – The present study suggests a single panmictic/stock population of longtail tuna in the South China Sea.

**Keywords** – *Thunnus tonggol*, South China Sea, mitochondrial displacement loop, cytochrome *b*.

**DNA Barcoding for Effective Fish Diversity Assessment in Merbok River: Towards Developing Local Database of Metabarcoding Study.**

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**Abstract**

**Purpose** – Compelling to goal fourteen (14) of the United Nations Sustainable Development Goals – Life Below Water, the study was conducted to examine the reliability of DNA barcoding method for species level identification as compared to conventional identification using morphological characters. The performance of DNA barcoding method was tested to assess the species diversity of local fish catches in Merbok River, located in Kedah, Malaysia.

**Design/methodology/approach** – Molecular tools of DNA Barcoding was utilised and genetic data were analysed in order to delineate fish species.

**Findings** – Preliminary data analyses revealed a total of 11 orders, 44 families, and 54 species that were sequenced (barcoded) for a 655bp region of the mitochondrial cytochrome oxidase subunit I gene (COI). Most species were represented by multiple specimens with sample mean of 3 samples per species, and a total of 154 sequences were generated. In addition to the barcode-based species identification system, phylogenetic relationships among the species identified have also been attempted.

**Research limitations/implications** – The study was designed in critical importance due to the fairly limited taxonomic studies on fish diversity in this country.

**Practical implications** – This study also would greatly be contributing to the development of a local fish barcode database that could be utilized in sympatric metabarcoding analysis.

**Social implications** – The diversity documented here will be a useful resource for future researchers and managers seeking accurate information on species composition of commercial fisheries and ultimately aid the formulation of effective and sustainable conservation plans.

**Keywords** – Goal 14, DNA barcoding, Merbok River, COI gene, Metabarcoding.

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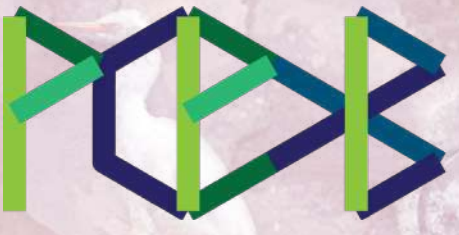

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