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THEVELI INTERNATIONAL CONFERENCE 2023

# ABSTRACTS

RESEARCH FOR INFORMED POLICY DECISIONS

Theveli

The Maldives National University  
21<sup>st</sup> and 22<sup>nd</sup> August 2023

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## About Theveli Conference 2022

Theveli is an international research conference, held annually since 2017, with an overarching theme for each year. The theme for 2022 is “Research for Nation Building”. Papers are categorised under the following sub-themes for this year:

- Fishery, agriculture, and marine resources
- Housing, infrastructure, land use and transport
- Environment and climate change
- Science and engineering
- Disaster risk management
- Education and training
- Fostering good governance and leadership
- Innovation and computer technology
- Religion and language
- History and culture
- Population and demography
- Governance and politics
- Journalism and social media
- Medicine and nursing
- Health, nutrition, fitness, and mental well-being
- Hospitality, travel, and tourism
- Entrepreneurship and management
- Industry and trade
- Economics and finance
- Law, justice, defence and security
- Gender and human rights

“Theveli” is a Dhivehi (Maldivian language) word which means rays spread on the sea (or water) at sunset or sunrise. The Maldives National University strives to spread rays of knowledge throughout the nation, region and beyond.

## Conference programme

<b>Day 1:</b>	<b>21<sup>st</sup> August 2023</b>
07:45-08:20	Registration
09:00–9:30	Opening ceremony
09:30-10:30	Keynote 1, Professor André Droxler
10:30-11:30	Break
11:30-12:30	Panel Discussion by MNU, UNFPA, MBS (In the year 2050: who works where?)
12:30-13:30	Lunch
13:30-14:30	Keynote 2, Professor Mark Sutton

### Concurrent Sessions

	14:30-14:50	14:50-15:10	15:10-15:30	15:30-16:60 (Tea/Poster Sessions)
<b>Room 1 (E2-10)</b>	Sasa Watanapokakul	Aaidha Hammad	Zayabalaradjane Zayapragassarazan	
<b>Room 2 (E2-11)</b>	Aminath Shafiya Adam	Thanis Tangkitjaroenkun	Mohamed Abdulla	
<b>Room 3 (E2-16)</b>	Mariyam Azeemath	Amir Taj	Tanvir Ahmed	
<b>Room 4 (E3-06)</b>	Ali Zahir	Fayyaz Ali Manik	Ali Ahmed Omran	
<b>Room 5 (E3-07)</b>	Aishath Sudha	Pushpa R Ekanayake	-	
<b>Room 6 (E3-12)</b>	Noora Khaleel	Nashwan Matheen	Christopher Doropoulos	
<b>Room 7 (E2-32)</b>	Aishath Shanoora	Sheena Moosa		
<b>Room 8 (E2-33)</b>	Monica Apte	Aminath Rinzy	Monica Apte	
<b>Room 9 (E2-34)</b>	Ismail Shiyar	Ahmed Munawwar	-	

**Day 2:**

**23<sup>rd</sup> August 2022**

9:00-10:00

Keynote speech 3, Dr. Rukhsana Ahmed

**Concurrent Sessions (10:00 – 11:40)**

	10:00 - 10:20	10:20 – 10:40	10:40- 11:00	11:00- 11:20	11:20- 11:40
<b>Room 1 (E2-10)</b>	Aminath Shiyama	Dinali Ariyasinghe	Muhammad Ullah	Faruhana Abdullah	-
<b>Room 2 (E2-11)</b>	Aminath Shafiya Adam	Mohamed Abdulla	Ruwan Gamage	Imad Salih	-
<b>Room 3 (E2-16)</b>	Ahmed Faisal	Fathmath Noora	Mohamed Anoof Shaheem	Ziuna Zubair	Saifulla Muslim
<b>Room 4 (E3-06)</b>	Aminath Haifa	Batool Z Qazi	Abdul Sattar Abdul Rahman	Fayyaz Ali Manik	-
<b>Room 5 (E3-07)</b>	Aishath Basma	Zameela Ahmed	Nafha Asim	Shazla Mohamed	Harshita Singh
<b>Room 6 (E3-12)</b>	Fathimath Nashfa	Selima S.Q.C Chowdhury	Tharanga S Disanayaka	Ahmed Khan	-
<b>Room 7 (E2-32)</b>	Suma Khalid Mohamed	Mariyam Jumana Abdulla	Ibrahim Miflal Fayaz	Sachintha P Malawige	-
<b>Room 8 (E2-33)</b>	Ahmed Inaz	Nasheeda Rasheed	Hinna Khalid	Ibrahim Didi	-
<b>Room 9 (E2-34)</b>	Pushpika P Masakorala	Ananda Y. Karunaraathne	Ashvin Wickramasoriya	Georgiou , E. Kyriakos	Salis Deris Artikanur

11:40-12:40

Keynote speech 4, Dr. Tobias Bernaisch

12:40-13:30

Lunch Break

13:30-14:30

Keynote speech 5, Professor Željko Bačić

### Concurrent Sessions (14:30-15:30)

	14:30-14:50	14:50-15:10	15:10-15:30	15:30-16:00
<b>Room 1 (E2-10)</b>	Mohamed Shareef	Ahmed Mohamed	Aminath Zifna	<b>15:30- 16:00 (Tea/ Poster Session)</b>
<b>Room 2 (E2-11)</b>	Mohamed Shihab	Shuhudha Rizwan	Batool Z Qazi	
<b>Room 3 (E2-16)</b>	Zeba Un Naher	Zeeniya Kamil	-	
<b>Room 4 (E3-06)</b>	Mohamed Mursaleen	Mohamed Mursaleen	Mustaffa Abdullah	
<b>Room 5 (E3-07)</b>	Irthisham H. Zareer	Christopher Doropoulos	Hana Amir	
<b>Room 6 (E3-12)</b>	Shiuna Ahmed	Azeeza Afeef	Aminath Zahir	
<b>Room 7 (E2-32)</b>	Sarah A. Elgezary	Noboru Zama	Sarah A. Elgezary	
<b>Room 8 (E2-33)</b>	Aishath Sinaau	Ifham Hassan Zareer	Mariyam Ashfa Hamdi	
<b>Room 9 (E2-34)</b>	Ulfah CN Litasari	-	-	

	16:00-16:20	16:20-16:40	16:40-17:00	17:00-17:20
<b>Room 1 (E2-10)</b>	Mohamed Zaid	Niuma Mohamed	Roza Ibrahim	-
<b>Room 2 (E2-11)</b>	Fathimath Ahlam Niyaz	Dinali Ariyasinghe	Fathimath Muna	-
<b>Room 3 (E2-16)</b>	Saadhath Moosa	Aminath Rinzy	Aishath Rafaahath Rameez	Tatiana Karabchuk
<b>Room 4 (E3-06)</b>	Usman Yoosuf	Nimal Mohamed	Norazam Khair Mohd Ithnin	Ishak Suliaman
<b>Room 5 (E3-07)</b>	Mohamed Alif Arif	Anoop Das	-	-
<b>Room 6 (E3-12)</b>	Shahuma Ali	Ahmed Hashim	-	-
<b>Room 7 (E2-32)</b>	Zeest Waris	Abhay Jith	Tejashree Sagaonkar	-
<b>Room 8 (E2-33)</b>	Dr. Aly Shameem	Aminath Sudha	Mobin	Zeenath Solih

## Keynote speakers

Professor André Droxler





## Professor Mark Sutton



Professor Mark Sutton is an environmental physicist based at the UK Centre for Ecology & Hydrology (UKCEH), in Edinburgh. An expert on atmospheric ammonia, he leads international research activities on nitrogen at the science–policy interface. He is a former chair of the International Nitrogen Initiative (INI) and currently directs the UNEP/GEF International Nitrogen Management System (INMS) and the UKRI Global Challenges Research Fund’s South Asian Nitrogen Hub (SANH). Professor Sutton is also a co-chair of the UNECE Task Force on Reactive Nitrogen (TFRN) and vice chair of the Global Partnership on Nutrient Management (GPNM).

## Dr. Rukhsana Ahmed



Rukhsana has a diverse career with several years of experience in child health and field research. She is a pediatrician with her focus on pediatric infectious diseases and child nutrition. In addition to her medical degree, she has a PhD in tropical infectious diseases and epidemiology. She has been trained in Pakistan, India, Australia, and the UK. She has worked as a clinician and academic researcher in low, middle and high-income countries and has experienced health systems across the globe together with her research career taking her to Indonesia, several African countries, and the USA. She has worked as a Research Associate at the Liverpool School of Tropical Medicine during which time she has managed several challenging field research studies as the Principal Investigator. She is a founding member of Clinesia, CRO in Indonesia where she leads the health research team and is Senior Advisor in Epidemiology at the Exiens Health Initiative in Jakarta where she continues to manage diagnostic malaria research. She has disseminated her research at notable international forums and congresses and has authored several publications in reputable peer reviewed journals. She has travelled widely for both work and leisure and is fond of experiencing different cultures, cuisines, and nature. She is global in her education, work and travels and can express herself fluently in English, Hindi, Urdu and Dhivehi, her native country language.

**Dr. Tobias Bernaisch**



Tobias Bernaisch is a tenured senior lecturer for English linguistics at Justus Liebig University Giessen, Germany. His research into dialects of the English language is dedicated to South Asian Englishes with a particular focus on Indian, Maldivian and Sri Lankan English and the interaction between regional and gender-related variation. Methodologically, his work is based on empirical methods including state-of-the-art statistical approaches. Among numerous other publications, he is the author of the first empirical monograph on Sri Lankan English and he edited a volume on gender in world Englishes. With the help of colleagues, he compiled several large-scale text databases for the study of South Asian Englishes and acted as (co) principal investigator in three third-party-funded research projects studying dialects of English.

## Professor Željko Bačić



Professor of satellite geodesy and geoinformatics sensor integration at University of Zagreb and University of Split. Prof. Bačić's research is covering wide range of satellite techniques applied for earth observation, positioning and navigation and their integration with other sensors for disaster risk reduction, smart cities development and spatial data infrastructure. The recent earthquakes in Croatia (2020) were an impetus for research into the development of smart cities in an environment threatened by potential disasters and the introduction of these contents into study programs using smart education. Dr. Bačić graduated at the Faculty of Geodesy University of Zagreb and did his postgraduate study at the Technical University of Graz. Beside academic career he also served as director general of National mapping and cadastre authority of Croatia 1999-2012.

## Abstracts

A total of 161 abstracts were submitted for this year's conference. Out of these 143 were accepted.

Authors affiliated with institutions from Bangladesh, Australia, Cyprus, UK, Japan, Malaysia, Indonesia, Oman, Bahrain, Croatia, India, Pakistan, Sri Lanka, and Maldives, are to present their papers at this conference.

MNU staff and students are to present 70 papers. Nearly 60 papers are from authors affiliated with foreign institutions.

This year's abstracts are compiled in the following pages, arranged by sub-themes 1 to 9.

Abstracts of poster presentations are also included here within their respective sub-themes.

*Sub-theme 1:*  
Science and Engineering  
Innovation and Computer Technology

10



## Temporal Variation of Indoor Air Quality (PM<sub>2.5</sub>) in a Residential Space, in Comparison to Outdoor Air Quality in Male', Maldives

Nooral Khaleel

*The Maldives National University*



### Abstract

There is a common misconception that air pollution is only an outdoor phenomenon, this problem is inevitable indoors as well. There is no study conducted on indoor air quality in the Maldives. Particulate Matter 2.5 (PM<sub>2.5</sub>), one of the criteria air pollutants, are particles suspended in air that is  $\leq 2.5$  microns. They are, potentially toxic, carcinogenic, allergenic, and irritating, and are associated with many respiratory and cardiovascular diseases. This study aims to assess the indoor air quality in a one-room apartment of approx. 240 sq ft in the Henveyru district of Male', Maldives. PM<sub>2.5</sub> concentrations were measured every 15 min inside the building using a low-cost PM BlueSky sensor, for 99 days; from 10-09-2021 to 18-12-2021. The results were compared with another BlueSky sensor installed outdoors in the same district at approx. 300m away from the Indoor sensor for the same duration. The average mass of PM<sub>2.5</sub> measured indoors was  $8.6 \mu\text{g}/\text{m}^3$ , while that from the outdoors was  $5.4 \mu\text{g}/\text{m}^3$ , both of which surpass the annual average of  $5 \mu\text{g}/\text{m}^3$  recommended by WHO. The recommended 24-hour mean PM<sub>2.5</sub> concentration of  $15 \mu\text{g}/\text{m}^3$  exceeded for 5 days inside the building, while it was only 3 days for the outdoors. The highest 24-hour mean value recorded inside was  $26.4 \mu\text{g}/\text{m}^3$  on 18-12-2021, which did not account for any notable activity. Higher pollution levels were observed inside the building and the hourly PM<sub>2.5</sub> shows a trend of accumulation inside at specific times of the day, which aligns with the household activities. It was noteworthy that pollutants were accumulating inside the building due to lack of ventilation. Based on these findings, efforts should be directed towards continuous monitoring of indoor air quality in different locations for longer periods and ensuring proper ventilation in residential spaces.

**Keywords:** *Indoor air quality, PM<sub>2.5</sub> (Particulate Matter 2.5), Air pollution, Maldives, Ventilation*

## Technology Selection for Wastewater Treatment in the Maldives

*Suma Khalid Mohamed*

*Fenaka Institute for Training and Research*



### Abstract

In the Maldives, the discharge of untreated wastewater into the sea poses a significant threat to public health and the marine environment. This study proposes sustainable, economically feasible, and socially accepted wastewater treatment technologies for small islands in the Maldives. The WAWTTAR software was used to simulate the performance of different wastewater treatment processes. The feasible alternatives identified from these simulations were analysed using an Multi-Criteria Analysis (MCA), considering various indicators that influence the decision-making process. Wastewater quality assessment revealed that the wastewater generated in the three islands studied, produced low concentrations of chemical and biological oxygen demand (COD and BOD) ranging from 267 – 309 mg/L and 128 – 219 mg/L, respectively. Nitrate and phosphate concentrations were also low (5.7 – 18.0 mg/L and 2.8 – 14.9 mg/L, respectively), where these concentrations in Dhidhdhoo and Hoarafushi were already within the maximum allowable limits of 15 mg/L and 10 mg/L, respectively, for discharge into the deep sea. Based on the findings, secondary treatment technologies such as membrane bioreactors (MBR) and sequencing batch reactors (SBR) with Ultraviolet (UV) disinfection were found to be the most feasible options for treating the wastewater. Additionally, sludge drying beds were recommended for sludge treatment as they were found to be the most economically feasible option. These results were further checked for robustness using a sensitivity analysis. This study demonstrates that the proposed methodology is suitable for technology selection and can provide valuable information for policymakers and stakeholders in the country and serve as a basis for future studies.

**Keywords:** *Maldives, wastewater treatment, Decision Support Tools (DST), WAWTTAR, Multi-Criteria Analysis (MCA), Weighted Sum Model (WSM)*



## **Optimizing Industrial Operations with Digital Twins**

*Lidiya Jose*

*The Maldives National University*

### **Abstract**

Digital Twins applications started emerging with the recent development of the Internet of Things (IoT). Both technologies share the same nature - connecting a physical artefact and its digital counterpart. Digital twin solutions in industry can help track resources (i.e., materials, labor, and equipment), monitor safety, make accurate assumptions and predictions, facilitate easier communication with stakeholders, automate progress monitoring and conduct resource planning and logistics. Digital twin creating software can connect disparate data sources, accurately model physical systems, and create a 3D view. This paper addresses the challenge of creating a digital twin of flour factory, with an emphasis on monitoring factory works. It involves (1) defining components to connect various data sources, (2) creation of entities that represent and capture the capabilities of physical equipment, processes and spaces, (3) specifying the relationship between entities and connect them to different data sources which creates a digital twin (4) uploading existing 3D models and visual assets to create 3D visualization and position them to match those physical environment and finally binding the real world data created using sensors and video components from the digital twin graph, (5) integrating the digital twin into a web application which allows operators and engineers to use the digital twin to monitor and optimize operations.

*Key Words: Digital Twin, Industry, Internet of Things (IoT) sensors, 3D models, physical environment, Digital platform*

## Improving Water Distribution Network Models with Data Assimilation: Unleashing the Power of Real-Time Improvements

*Ibrahim Miflal I.M Fayaz*

*Fenaka Institute for Training and Research*



### Abstract

To maintain an effective and reliable water supply, water distribution networks (WDNs) are essential infrastructures requiring precise modeling. Existing WDN models created from historical data, however, are often unable to adapt to changes in real-time and incorporate new data to increase their accuracy. The challenge at hand is to improve WDN modeling by utilizing data assimilation techniques, allowing models to dynamically evolve and capture the dynamic behavior of water distribution systems in real-time. To lower model errors in WDN models, this study explores the possibility of a three-step Data Assimilation (DA) method that makes use of the Ensemble Kalman Filter. The study explores the effectiveness of the DA method, factors influencing its performance, such as assimilation steps, number of ensembles, and measurement uncertainties. The study shows that the DA approach is more effective when the assimilation steps and ensembles are increased. Additionally, using sensors with higher precision and lowering measurement bias produces improved results. The effect of measurement uncertainty on the effectiveness of the DA technique, varies depending on characteristics of each WDN. In conclusion, this study highlights the potential of data assimilation methods to improve WDN modeling. Water utilities can gain from more precise predictions, greater system performance, and efficient decision-making for the management and maintenance of water distribution networks by allowing models to adapt and improve dynamically.

*Keywords: Wastewater Characterization, Wastewater Treatment Trains, WAWTTAR, Multi-Criteria Analysis, Maldives*

## **Unexpected rain ruins the drying process in the open sun: Solution for a household and small-scale industry.**

**Sachintha P Malawige**

*Sri Lanka Institute of Information Technology*



### **Abstract**

Open sun drying (OSD), is the simplest and cheapest method of drying foodstuffs at the household level. However, the losses to food quantity and quality due to unexpected rain are substantial. Protecting food from unexpected rain is a major problem for modern homemakers as they are predisposed to spoilage once they become wet during drying. Various artificial methods are used to overcome food spoilage problems. Renewable sources are often sought after for the purpose as they can save energy for preservation and maintain the natural flavour of the product. There are no alternative methods to open sun drying for household and small-scale industries which can satisfy customer needs. Therefore, this research aims to introduce a low-cost, easy-to-use, reliable, and durable open sun dryer that can ease the drying process at the household and small-scale industrial level. A process in a sequence of steps is followed to achieve the goal. First, customer needs were studied by using qualitative survey methods and need analysis was conducted. The objectives were identified, and the problem statement revised accordingly. Second, maps and Ishikawa diagrams were produced which led to the development of conceptual designs. Five conceptual designs were developed, and one design was selected after evaluation of the alternatives. Thirdly, the cost of production was calculated following the principles of economics in designs for selected designs. Finally, an Automated Open Sun Drier (AOSD) was introduced that protects foodstuff from unexpected rain while drying them under the open sun in households and small-scale industries, which can satisfy customer needs. AOSD is expected to change the present attitude of buying processed foods from the market and facilitate the trend to process our foods in our homes.

**Keywords:** Open Sun Drying, Food Preservation, Renewable Energy, Household Drying Technology, Automated Sun Dryer

## **Preventing Energy Theft through Predictive Analytics and Deep Learning Techniques**

*Zeest Waris, Abdul Jaleel*

*University of Engineering and Technology Lahore*

### **Abstract**

In recent years, energy companies have faced increasing challenges in detecting fraud and theft in their networks. Conventional methods of detecting fraud and theft have proven to be time-consuming and resource-intensive, making it challenging to identify the instances of fraud and theft in a timely manner. To tackle this challenge, energy companies have turned to advanced analytics techniques such as machine learning and deep learning. This paper aims to discuss the use of Artificial Intelligence (AI) in energy fraud and theft detection, specifically focusing on the use of decision tree algorithms, ensembling techniques, and deep learning models. This paper demonstrates the application of a decision tree algorithm to predict the risk of fraud or theft in energy networks using customer billing history and demographic information. The use of bagging to improve the performance of the model is shown. In addition, the use of deep learning models, specifically Transformers and neural networks, to analyze large amounts of data and identify complex relationships between various factors such as energy usage patterns, billing history, and demographic information is discussed. Performance of the models using metrics such as accuracy, precision, recall, F1-score, and AUC-ROC is evaluated to demonstrate that the use of AI in energy fraud and theft detection results in more accurate predictions compared to conventional methods. The results of the paper provide a roadmap for energy companies to leverage AI and advanced analytics techniques to tackle the challenge of fraud and theft in their networks. In conclusion, this paper highlights the potential of AI in energy fraud and theft detection and provides a framework for energy companies to adopt AI-based solutions to enhance their anti-fraud efforts. The paper provides a promising outlook for the future of AI in the energy industry and opens avenues for further research and development in this field.

*Keywords: Energy Fraud Detection, Artificial Intelligence (AI), Machine Learning, Deep Learning, Ensembling Technique*

## Dual Holographic Method for Real-Time Monitoring and Analysis of Stress Formation in Photopolymer

*Abhay Jith<sup>1</sup>, K. Rajeev Kumar<sup>1</sup>, Ajith Kumar P.T<sup>2</sup>*

*<sup>1</sup>Cochin University of Science and Technology, <sup>2</sup>Light Logics Holography and Optics*

### **Abstract**

Photopolymer materials have demonstrated remarkable versatility in the development of various photonic devices, and the market now offers photopolymers with efficiency exceeding 90%. This breakthrough has opened a multitude of applications, including high-efficiency holographic solar concentrator elements. A significant challenge that arises during the exposure of photopolymer materials to light is the formation of internal stress. In real-life conditions, the presence of stress can adversely affect the performance of the recorded diffractive structure and the device itself. Hence the study of stress formation in Photopolymer materials is of paramount importance. In this work, a method for remote monitoring of stress formation during live recording of photopolymer holograms is reported. The technique utilises a dual holographic arrangement with two diode-pumped solid-state (DPSS) lasers (532 nm and 639nm). The green branch of the optical arrangement is a live fringe holographic interferometer, based on a standard commercial photopolymer material. The red branch records hologram (H2) in a red sensitive photopolymer (Holomer 6A) test sample film coated on a microscope slide. As a first step, a reflection hologram (H1) of the secularly reflecting side of the test sample is recorded and fixed with white light. After this, a transmission hologram H2 is recorded in the test material, by exposing the red arm. As the recording process commences, high-contrast live stress fringes become visually apparent and can be observed directly with the naked eye, in both the reference and object beam directions of the green arm. The observed results on various test samples can be compared to have a comprehensive study of the stress formation phenomenon.

**Keywords: Photopolymer Materials, Stress Formation, Holographic Interferometry, Remote Monitoring, Photonic Device**

## Determination of Heavy Metals in Seawater of Thilafushi Island

*Mariyam Jumana Abdulla*

*The Maldives National University*



### **Abstract**

Heavy metals are persistent pollutants that can be toxic when it exceeds certain levels in the body. Aquatic species can absorb heavy metals present in the water, and get biomagnified up the food chain. Thilafushi Island is a landfill area where majority of the waste produced in the Maldives is accumulated and managed. The waste piles in the island are in close proximity to the sea, and the possibility exists for heavy metals to leach from the piles into the surrounding waters. Maldivians highly depend on fish as a staple food source. Even though pelagic fish is more popular among locals, there is a considerable number of people who consume reef fish as well. Reef fish species in the surrounding waters to Thilafushi Island are likely to absorb metals and toxic substances resulting from leachate and the locals could be exposed to ample levels upon consumption. Hence, it is important to prevent this by evaluating and monitoring the pollution status of the marine ecosystem. The study evaluated the presence of copper, zinc, and iron, in sea water surrounding Thilafushi Island and whether they exceed the permissible limits of the World Health Organization (WHO) guidelines. The metals are detected in the landfill area and the non-landfill area which served as the control. The concentrations of the metals detected in all samples were significantly lower compared to the WHO guidelines. However, this does not eliminate the problem of pollution by heavy metals as quantities not detected in the water samples might be present in the aquatic species. Therefore, further evaluation and monitoring covering both environmental and bionic sampling is necessary.

**Keywords:** *Heavy Metals, Bioaccumulation, Thilafushi Island, Contamination, Water Quality Monitoring*

## Designing for Serenity: A Study on the Impact of Public Open Spaces on the Well-being of Residents in the Maldives

*Sarah A. Elgezary*

*The Maldives National University*



### **Abstract**

The design of public open spaces plays a vital role in promoting the well-being of residents in urban environments. This study investigates the influence of public open space design on the well-being of residents in the Maldives, an archipelago nation renowned for its natural beauty and unique island communities. Recognizing the significance of providing serene environments in the context of the Maldivian lifestyle, this research examines the relationship between public open space design and the well-being of its residents. The research adopts a mixed-methods approach, combining quantitative surveys and qualitative interviews to collect data from a representative sample of Maldivian residents. The quantitative survey measures residents' perceived well-being and satisfaction with various dimensions of public open spaces, including aesthetics, accessibility, amenities, and natural elements. Preliminary findings suggest that well-designed public open spaces positively influence the well-being of residents. They reported higher levels of well-being when public open spaces incorporated elements such as lush greenery, water features, recreational facilities, and cultural expressions that align with the unique cultural heritage of the Maldives. Additionally, accessibility, safety, and opportunities for social interactions were identified as key factors contributing to a sense of community and well-being. This study contributes to the growing body of knowledge on the importance of public open space design in promoting well-being in urban environments. The findings provide valuable insights for urban planners, architects, and policymakers in the Maldives and other similar island communities, highlighting the significance of incorporating serenity-inducing elements in public open space designs.

*Keywords: public open spaces, well-being, residents, Maldives, design, serenity, urban environments*

## **Blockchain and its application in Airline system and Image processing application in hospitality industry**

*Monica Apte<sup>1</sup>, M.B. chandak<sup>2</sup>*

*<sup>1</sup>MIT-World Peace University, <sup>2</sup>Shri Ramdeobaba College of Engineering and management*



### ***Abstract***

The objective of the study was to explore the application of blockchain in Airline system. A critical review was conducted using the keywords, 'blockchain', 'security', 'Airline system' and 'access control'. The results showed that blockchain is a distributed database system where the data is contained/stored in the form of blocks. These blocks containing information are distributed across a network and are connected to each other. Hence the name blockchain. Each node follows the same set of protocols in the same network and users in blockchain can communicate with each other. The data in blockchain cannot be manipulated and hence it is highly secure. Due to the security feature of the blockchain technology it can be utilized in various ways to enhance security in airport operations like identity verification, tracking and management of baggage, maintenance of flight records, loyal passengers record, security, and access control. Blockchain can support air ground handlers, air traffic control and airports to share and access real-time data securely. This can improve communication, optimize flight schedules, reduce delays, and enhance overall operational efficiency.

***Keywords: Blockchain, security, Airline system, access control***



*Sub-theme 2:*  
Environment and Climate Change  
Fishery, Agriculture and Marine  
Resources

17



## Status and Trends of Hard Coral Cover Derived from Long-term Monitoring Sites in The Maldives: 1998-2021

**Hana Amir**

*Maldives Marine Research Institute*



### **Abstract**

Climate change driven increases in sea surface temperatures and intensifying El Niño Southern Oscillation episodes are increasing the magnitude and frequency of coral bleaching events worldwide. The 1998 global mass bleaching event, triggered by a strong El Niño episode, decimated Maldivian hard coral cover nationwide to a mean of 2%. The MMRI initiated the National Coral Reef Monitoring Program to assess coral reef recovery, health, and resilience over time. In this study, hard coral cover data collected over a 23-year period through repetitive reef surveys of 16 long-term monitoring sites was analysed using Bayesian Hierarchical Generalized Mixed Modelling to generate coral cover trends and investigate the factors that affect its patterns. National, combined management and depth, and regional coral cover trends were derived using three separate models. The national model showed signals which closely matched stress events including minor and major bleaching events. Whilst the combined model showed a difference in coral cover with management regimes, the effects of the regimes were weak. Meanwhile, the regional model showed notable latitudinal similarities and differences in the coral cover trend across regions. Additional site level analyses corroborated the variability of recovery with sites showing distinct intra-regional differences in recovery patterns. The assessment provided an increased confidence that coral reefs of the Maldives can resist and recover from combined impacts of global and local stressors of various magnitudes. Yet, simultaneously the assessment emphasized that hard coral cover is only a facet of coral reefs, as well as its recovery, health, and resilience, whereby using hard coral cover as the sole indicator of these parameters is insufficient. Thus, while trends in coral cover can indicate reef recovery over time, these same trends underscore the need to assess additional metrics to fully understand the overall reef recovery.

**Keywords:** *Climate change impact, Coral reefs, Coral bleaching, Reef recovery, Trend analysis*

## **Vegetation density and its relation to land surface temperature distribution in Malang, Indonesia**

*Salis Deris Artikanur; Widiatmaka Widiatmaka, Yudi Setiawan  
Marimin Marimin*

*IPB University,*

### **Abstract**

Malang is an area in East Java Province, Indonesia that consists of a regency and a city. This area is experiencing rapid growth of built-up land due to its proximity to the metropolitan city of Surabaya. The growth of built-up land often results in reduced vegetation cover and density owing to massive development. Vegetation is very important for the balance of environmental conditions, including the production of oxygen, water storage, and temperature control to prevent global warming. This study aimed to analyze the vegetation density using the normalized difference vegetation index (NDVI) and its relationship to land surface temperature (LST) in Malang, East Java, Indonesia. The method used was to calculate NDVI and LST along with their distribution using Landsat 8 satellite imagery from Google Earth Engine. This study found that the NDVI in Malang ranged from -0.40 to 0.99. A higher NDVI value indicates denser vegetation in a location, and vice versa. Meanwhile, LST ranged from 13.0°C to 34.5°C. The distribution of NDVI and LST had a negative relationship; namely, the higher the NDVI (dense vegetation), the lower the LST. Conversely, the lower the NDVI (sparse vegetation), the higher the LST. In general, areas of Malang, which have dense vegetation and low temperatures, are in forest and mountainous areas, while areas with sparse vegetation and high surface temperatures are in built-up and urban areas. Based on the results of this study, the vegetation density must still be considered and allocated in development activities to achieve sustainable development, maintain ecological balance, and mitigate global warming.

*Keywords: normalized difference vegetation index, global warming, google earth engine, built-up land, sustainable development*

## **Analysis of Flood Inundation Areas with The Variation of Water Levels in Kalu Ganga in Sri Lanka Using GIS-Based Flood Model**

*Ashvin Wickramasooriya*

*University of Peradeniya*

### **Abstract**

The main objective of this study is to analyze flood inundation areas with the variation of water levels of the Kalu river. To achieve this task initially drainage basins in Sri Lanka were created using the Shuttle Radar Topographic Mission (SRTM) and the Kalu ganga basin is extracted from these basins. Then using hydrology tools in the ArcMAP spatial analyst, Kalu Ganga drainage network has extracted. Thereafter, ten-meter contour map is used to prepare the verified version of DEM of the Kalu ganga basin. A buffer zone was demarcated for the whole drainage network of the basin. Then the DEM and raster version of the buffer zone data layers were transferred to ArcScene. The next step of the study was to create 1m water levels of the study area. Finally, flood inundation model has introduced using ArcScene. This model helps to identify flood inundation areas with different water levels in the river. Thus, this model can be utilized as an early warning of flood event occur in future.

*Keywords: Flood, Inundation, Digital Elevation Model*

## Developing a guidance framework for larval-based restoration of Maldivian coral reefs

*Christopher Doropoulos<sup>1</sup>, George Roff<sup>1</sup>, Hana Amir<sup>2</sup>, Lauren Hardiman<sup>1</sup>, Damian Thomson<sup>1</sup>*

<sup>1</sup>*Commonwealth Scientific Industrial Research Organisation (CSIRO),*

<sup>2</sup>*Maldives Marine Research Institute*



### **Abstract**

In response to recent reef declines, the MMRI initiated a 5-year Coral Reef Restoration and Rehabilitation program in 2019. As part of the program, restoration of coral reefs using coral larvae was identified as a low impact and scalable approach. The method involves harvesting coral larvae, culturing them, and settling them on devices or releasing them directly onto the reef. While it has been practiced in other parts of the world, larval-based restoration has hardly been attempted on Maldivian reefs. Hence, there is a need to determine how best to adapt larval methods used in other parts of the world to the Maldives. To apply this method, MMRI and CSIRO have taken a staged approach. The first stage involves quantifying the timing and spatial variability of coral spawning across different atolls in the Maldives. Reefs across six atolls from the central and south region were sampled for fecundity, with reefs from three atolls sampled repetitively. The second stage involves training local stakeholders on how to collect, culture, and release coral larvae onto reefs through a series of online and hands-on workshops. Participants from different atolls, backgrounds and professions were trained in coral biology and larval restoration methods which provided insight into how transferable such knowledge is in the Maldives. The results and experiences of these stages were synthesised to create a standard that can be followed to pursue larval based restoration methods in the Maldives. Thus, to provide practical guidance for this process we present the Standard Operating Procedures for the use of larval-based restoration in the Maldives.

***Keywords: Climate Change, Coral reefs, Restoration***

## Evidence for asynchronous cycles of reproduction and spawning among corals in the Maldives

*George Roff, Hana Amir, Risla Ibrahim, Ahmed Hadhif Hassan, Aminath Zana Shiraz, Damian Thomson, Christopher Doropoulos*  
*CSIRO, Maldives Marine Research Institute*



### Abstract

Restoring corals on a large scale can be achieved through larval-based restoration, a technique that has minimal impact on existing corals. The approach involves collecting eggs and sperm released during spawning events, rearing them into larvae, and then deploying them onto reefs to kickstart recovery. However, to successfully collect the gametes that can be used in coral reef restoration, it is important to understand when corals reproduce and spawn. Unfortunately, there is limited information on the timing of spawning in the Maldives. Information regarding which species of corals spawn at what time of year and whether there are differences in timing based on which region of the Maldives the coral reefs are located is sparse. To address this knowledge gap, we used three methods (1) collating information from public sources that have recorded or reported either coral spawning or observations of coral spawn slicks, (2) conducting temporal sampling of corals in North Male', South Male', and South Ari atolls, and (3) surveying across a latitudinal temperature gradient using extensive sampling throughout Thaa, Laamu, and Huvadho atolls. Our preliminary findings reveal that spawning in the Maldives is largely asynchronous. Spatial and temporal sampling supports this notion as there were notable differences in the fecundity of sampled corals in space and time. This is further supplemented by the collated information which reveal coral spawning events throughout most of the year. These preliminary results highlight the need for further data collection to inform larval-based restoration efforts.

Keywords: Coral, reproduction, restoration, spawning, surveys

## A case study of coastal change in the Maldives during the 2019 extreme Indian Ocean Dipole event

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<sup>1</sup>CDE Consulting, <sup>2</sup>Maldives Space Research Organisation, <sup>3</sup>Simon Fraser University, <sup>4</sup>National University of Singapore



### Abstract

While the influence of the Indian Ocean Dipole (IOD) on winds, waves, and water levels have been studied in detail, the effect of these IOD-induced met-ocean anomalies on coastal zones has so far received limited attention. This study evaluates the effect of IOD events on sandy coastlines by undertaking a case study of five islands in the Maldivian archipelago during the 2019 extreme positive IOD (pIOD) event. A six-year dataset of shorelines before, during, and after the pIOD event was analysed to establish the seasonal oscillation trends in the shorelines, and thereby identify variability induced by the pIOD event. The results indicate a departure in the shorelines beyond the magnitude of the year-on-year variability during the mature phase of the pIOD event (September to November 2019) and interestingly, a substantial lagged response of the shorelines in the months immediately following the end of the pIOD event (November 2019 to April 2020). It was identified that the anomalous met-ocean conditions during the pIOD event resulted in a change in the seasonally varying sediment buffer around the island, with potential implications on the medium-term island change and overall stability for the vegetated island core. The results showed that it took up to two years after the end of the pIOD event for the shorelines to return to the pre-pIOD equilibrium state.

Keywords: Indian Ocean Dipole, Atoll Islands, Island Morphology, Shoreline Variability, Remote

## **Mangrove Management in Small Island Developing States - Comparison of Management Practices in B. Goidhoo, Maldives and N. Kendhikulhudhoo, Maldives**

*Aishath Enash<sup>1</sup>, Mohamed Alif Arif<sup>1</sup>, Ahmed Aslam Waheed<sup>1</sup>*

*<sup>1</sup>The Maldives National University*

### ***Abstract***

Mangrove ecosystems provide a range of benefits including raw materials, coastal protection services, tourism attractions and carbon sequestration. However, these ecosystems are under threat due to factors such as habitat destruction, over-exploitation of resources and climate change. To reduce pressure on mangrove resources and sustainably manage them, it is important to have mangrove management systems that are managed either by the government or by the local communities. In this study, we evaluated the mangrove management practices found in the islands: B. Goidhoo and N. Kendhikulhudhoo. B. Goidhoo mangrove is in the biosphere reserve of the Maldives and is managed by the biosphere reserve office, under the Ministry of Environment, Climate Change and Technology. On the other hand, N. Kendhikulhudhoo mangroves are managed by the local community in collaboration with the local island council. Data on the management practices of these two islands were collected through stakeholder interviews and field observation. The study finds that the management of N. Kendhikulhudhoo mangrove is more in line with the principles of governance such as legitimacy, transparency, accountability, inclusiveness, fairness, integration, adaptability, and procedural justice. Findings from this research depict that bottom-up and co-management models of managing mangroves lead to more sustainable outcomes when compared with top-down management due to increased transparency and inclusiveness because of direct involvement of the community in the management of mangroves. Furthermore, bottom up and co-management models are more in line with the principles of legitimacy and fairness as there is more stakeholder acceptance of management actions.



## **Habitat preferences of fruit feeding butterflies at natural tree fall gap, forest edge and canopy in a tropical forest in the Western Ghats, Kerala, India- Insights to the climate change scenario.**

**Anoop Das<sup>1,2</sup>, Freerk Molleman<sup>3,4</sup>**

<sup>1</sup>M.E.S Mampad College, <sup>2</sup>Wildlife Research and Conservation Trust,

<sup>3</sup>Indian Institute of Science Education and Research, <sup>4</sup>University of Tartu

### ***Abstract***

Insect communities in tropical forests tend to be structured vertically and with respect to gaps, because insects are usually habitat specific. Furthermore, insect communities vary over time. The limited geographic coverage of insect community structure studies show that certain community structure attributes vary among regions. We compared fruit-feeding butterfly communities among understory, canopy, natural treefalls, and forest edge, in a sub-tropical forest of the Western Ghats, a strip of tropical rain forest isolated from the large rain-forest belt of South-East Asia. We caught 3021 individuals belonging to 35 species and representing 14 genera during 2173 trap days in a year-long study. While some butterflies were caught in the canopy, no species was significantly more abundant in the canopy than in the understory, in contrast to studies elsewhere where 14-55% of the species could be classified as canopy specialists. Even though the largest numbers of species were caught in the traps at forest edges, species diversity was highest in the gaps. The communities at the forest edge differed importantly from those in treefall gaps, as in traps at the forest edge we caught more grassland species and less forest species. Larger tree falls gaps had richer butterfly communities. Both abundance and diversity peaked during the late monsoon season, and this was true for all common species in our sample. Our results and published studies suggest that insect community structure of isolated rain forest biomes may differ from the main rain forest blocks regarding vertical stratification. We discuss why this may be and emphasize the importance of gaps in tropical forest ecology.

Keywords:

## An Assessment of the Effectiveness of the EIA System in the Maldives

Mohamed Alif Arif<sup>1</sup>, Ahmed Aslam Waheed<sup>1</sup>

<sup>1</sup>The Maldives National University



### *Abstract*

Environmental Impact Assessment (EIA) is a decision-making support tool, which informs decision makers of the environmental impacts of proposed developmental projects. The main goal of EIA is to promote sustainable development. Such tools are particularly important to small island developing states such as the Maldives, who rely on surrounding ecosystems to support their economies. Hence it is important to understand how well EIAs are achieving their goals in these countries. This study assesses the effectiveness of the Maldivian EIA system, specifically the procedural dimension of effectiveness, using twenty-four review criteria. The procedural dimension of effectiveness is focused on the EIA system's laws, regulations, guidelines and how they are implemented. The twenty-four review criteria used in this assessment are divided into systemic measures and foundation measures. The systemic measures look at EIA legislation, EIA administration and EIA process, while the foundation measures examine guidelines, training and maintenance relating to the EIA system. Data for the assessment was obtained from laws, EIA regulations, stakeholders, and expert interviews. The study aims to identify areas that need improvement, and suggest recommendations based on internationally established best practice and expert opinion. The assessment of the EIA system reveals that it satisfies most of the criteria. However, stakeholders and experts interviewed have identified critical areas in its implementation that require improvement. To address these areas, it is recommended that the country implements strategic environmental assessment (SEA) and establishes mechanisms for setting appropriate baseline conditions and regulatory requirements for the EIA system implementation monitoring. Furthermore, the public and stakeholder participation process needs to be improved.

Keywords: EIA, Effectiveness, Procedural, Maldives, Sustainable  
Development

## Social Acceptance and Social, Economic and Environmental Impact of Renewable Energy – A Case Study from the Maldives

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*<sup>1</sup> Sophia University, <sup>2</sup>Japan International Cooperation Agency Maldives Office, <sup>3</sup>The Maldives National University*



### Abstract

Social acceptance particularly public opposition on renewable energy have been key obstacles for renewable energy deployment in many developed nations particularly in Europe. Although the situation in the global south such as Small Island Developing States (SIDS) was not well known. This study applies cultural theory with data collected from household questionnaire surveys, focus group discussion and individual interviews conducted in Haa Dhaalu Atoll Hanimaadhoo island in the Maldives to develop deeper understandings of how individuals' worldviews inform opinions and behaviour in relation to renewable energy. This study also attempts to understand the expected social, economic, and environmental impacts of renewable energy. Key findings from a local's lens are addressed which the authors believe important to consider for further deployment and dissemination of renewable energy in the Maldives.

Keywords: Social Acceptance, Renewable Energy, Social, Economic and Environmental Impacts, Cultural Theory, Maldives

## Assessment of Oceanic Manta Ray (*Mobula birostris*) and Whale Shark (*Rhincodon typus*) sightings in Fuvahmulah using Local Ecological Knowledge (LEK)

*Irthisham Zareer*<sup>1</sup>, *Mariyam Nashath*<sup>1</sup>, *Tam Sawers*<sup>2</sup>, *Clara Canovas*<sup>3</sup>

<sup>1</sup>The Maldives National University, <sup>2</sup>The Manta Trust- Maldives Manta Conservation Programme, <sup>3</sup>Maldives Whale Shark Research Programme



### Abstract

Marine megafaunas are considered culturally, economically, and ecologically significant in the Maldives. They generate substantial monetary benefits through tourism and are extremely popular with local communities due to their charismatic nature and sheer size. Studies on megafauna species where significant hotspots coincide with remote locations are limited globally. One such example is the unique population of oceanic manta rays (*Mobula birostris*) and whale sharks (*Rhincodon typus*) in Fuvahmulah, which has only garnered dedicated research attention over the past few years. Citizen science data, dive logbook records and anecdotal reports from fishers have reported the presence of both species throughout the years. This study aims to collate data on both species with the use of fishers and scuba divers' Local Ecological Knowledge (LEK) using semi-structured interviews. A total of 25 participants were interviewed, and the data gathered was analysed using a mixed method approach. The four main themes identified include (1) Experience levels and background information, (2) LEK on focus species, (3) Threats and (4) Perception and awareness of research and conservation efforts. Results suggest that both fishers and divers have a wealth of knowledge that can be used to better understand both species. They also indicated that the sightings of oceanic manta rays and whale sharks have decreased throughout the years, both in terms of sighting frequency and numbers of individuals seen at a time, in contrast, the locations and time of species sightings remain similar. The study identifies the need, as well as opportunity, for research and conservation efforts to be more inclusive of the local communities in their research communications, as participants were seen to be keen,

supportive, and willing to learn about the research. Having the support of these experienced fishers and divers could be key to bringing improvements in future efforts informing conservation and management strategies.

Key Words:



## Understanding Behavior Change Perceptions for Use of Plastic Water Bottles in the Restaurant Industry

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*<sup>1</sup> The Maldives National University, <sup>2</sup>Small Island Geographic Society*



### Abstract

This formative research is conducted to understand the current behaviors and perceptions in the use of polyethylene terephthalate (PET) water bottles and its alternatives by the restaurant industry. The use of PET water bottles is increasing, leading to plastic pollution, affecting marine ecosystems and human health. This quantitative survey, including 38 restaurants in Hulhumale' is the first step to behavior change, known as empathizing. This focuses on initially understanding the current behavior of using PET water bottles, and their perception on changing to sustainable alternatives, such as glass bottles and filtered water. The survey shows that 73.7% of the restaurants use PET water bottles and 26.3% use sustainable alternatives. The reason for the use of PET water bottles includes it being more convenient, safe, and hygienic. Based on the findings, most feasible change can be made by implementing rules and regulations and providing necessary information on material incentives.

*Keywords: sustainable alternatives, plastic water bottles, plastic pollution, behavior change, empathizing*



## **A systematic review on biodegradable waste management system**

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<sup>1</sup>MIT-WPU

### **Abstract**

The objective of the study was to explore the biodegradable waste management system. A systematic review was done using the keywords, waste management, monitoring, biodegradable waste, and recycling. The results showed that the waste management system plays a crucial role in addressing the challenges posed by increasing waste generation and its environmental impacts. Waste is an unnecessary input to or any undesirable output from any system comprising all types of resources. Waste management is all those activities and action required to manage waste from its final disposal. This includes -collection, transport, treatment, and disposal of waste together with regulation and monitoring. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling. The amount of waste generated by humans was insignificant due to low population density and low societal levels of the exploitation of natural resources. Common waste produced during pre-modern times was mainly ashes and human biodegradable waste. technological advancements in waste management, such as composting, anaerobic digestion, and waste-to-energy processes, showcasing their potential in reducing waste volumes and recovering valuable resources.

Keywords - waste management, monitoring, biodegradable waste, recycling

## Implementation of Waste Minimization and Sustainable Practices Among Tourism-Related Businesses in The Maldives

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Abdulla Nazeer<sup>1</sup>*

*<sup>1</sup>The Maldives National University, <sup>2</sup>Parley Maldives*



### **Abstract**

Micro, Small, and Medium Enterprises (MSMEs) from the tourism sector including guest houses, liveaboards, cafes, restaurants, and related businesses in the selected islands in the Maldives are supported in implementing waste minimization options in their business operations. The activities are in line with the Sustainable Consumption and Production (SCP) approach focusing on switching from single-use plastics to alternatives, waste segregation, and other waste minimization options. The PROMISE methodology, an amalgamation of the internationally recognized Resource Efficient Cleaner Production (RECP) approach and the Avoid, Intercept, and Redesign (AIR) scheme developed by Parley for the Oceans has been adopted for this action. Mobilization of MSMEs is undertaken through quick assessments and audits, direct consultancy, and training by visiting the participating MSMEs. Currently, 128 MSMEs have been given 833 options of which 58.8% are recommendations for switching from single-use plastics to a more sustainable alternative. So far, MSMEs have implemented 21.3% of the recommended alternatives. For example, switching to glass water bottles as an alternative to commonly consumed PET water bottles is one of the major waste reduction options along with plastic amenity bottles, straws, bin liners, bags, and other packaging materials. Even though MSMEs are willing to switch to sustainable products, there is a need for capital support for high-cost implementations such as installing water filtration systems, glass bottle cleaning systems, or solar panel installments. Also, the lack of availability of other financial and capital resources is a major challenge along with the scarcity of sustainable products available locally. These actions will contribute to adopting sustainable tourism which is crucial in preventing marine litter and

preserving the pristine environment on which we are very much dependent for our social and economic well-being.

Keywords: Waste Minimization, Plastic Pollution, Marine Litter, SCP, Single-Use Plastics

## Effectiveness of single- use plastic ban policy in the Maldives

*Sofooru Kausar Usman<sup>1</sup>, Zameela Ahmed<sup>1</sup>, Nahid Shakir<sup>1</sup>*

*<sup>1</sup>Live and Learn Environmental Education*



### **Abstract**

USAID - Ocean Plastic Reduction Activity, conducted a study which documented discussions with government institutions, private agencies, and island communities, on the opinions and strategies for solving one of the most prominent environmental issues: marine plastic pollution. Specifically, the study explored perceptions of the public on the plastic ban and its effectiveness on reducing plastic pollution from entering the marine environment. The study was conducted from December 2022 to May 2023, directly after the Government announced its Directive to ban the most used single-use plastic items. The study applied the snowball method as a methodological choice to identify stakeholders in this space – identifying businesses and private sector players. Systems thinking was utilized as a participatory modelling approach, which allowed for the creation of conceptual mind maps from the 14 focus group discussions and 51 consultations with 108 participants, to understand perceptions, and to map out challenges on plastic reduction and marine pollution. Plastic pollution takes place on a global scale and stakeholders discussed their individual perceptions of solutions and how it relates to their local context. Communities were more accepting of policy but placed weight on the government to introduce alternatives, a unified behavior change approach and a systematic solid waste management process. Businesses emphasized that disincentives were introduced and the need to incentivize change. Future generation stakeholders (aged 18 - 34), highlighted consumer behavior change as the way forward in line with 3R. Enforcing plastic ban policy, in line with a functional regional waste management facility will be crucial in providing a sustainable waste management solution. This should be linked with unified social behavior change initiatives that emphasizes approaches such as the circular economy and zero waste to protect and reduce plastic leakage to the marine environment.

Sub-theme 2: Environment and Climate Change, Fishery, Agriculture and  
Marine Resources

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Keywords: SUP, marine pollution, community, circular economy,  
waste management

## Understanding Types, Sources and Sinks of Marine Litter on Hulhumale Phase II Beach in the Maldives

Shazla Mohamed<sup>1</sup>, Paolo Facco<sup>2</sup>, Fathimath Nafha Asim<sup>1</sup>, Shaahina Ali<sup>3</sup>

<sup>1</sup>The Maldives National University, <sup>2</sup>Adelphi Research gemeinnützige GmbH, <sup>3</sup>Parley Maldives



### Abstract

A pilot material flow study was conducted to understand the composition of marine litter and their sources and sinks on the SE beach of Hulhumale' Phase II, Maldives. This included manual sampling from beach segments, collection of drone imagery and stakeholder interviews. Three transects (20m x 10m) were laid on the stretch of the beach based on the pollution level (high, medium, low) of the segment. All litter in each transect were collected and characterized based on the nature and use, which were then quantified and weighed. Qualitative interviews were conducted with relevant stakeholders (n=10) to support the information. Based on the high-polluted transect, plastics (51.6%), paper and cardboard (20.1%) and styrofoam (10.3%) were the most common types of litter present. Other categories include polylaminates (7.2%), metals (5.5%), glass and ceramics (0.2%), textiles (0.2%) and others (3.9%). Majority were disposable or single use items such as PET bottles and caps, food wrappers, cigarette butts and aluminium cans. Several sources and types of municipal waste, specifically plastic waste on the beach originating from either waste drifted by the sea or waste littered on site were identified. They were found to originate from tourism activities (mainly from docked liveaboards and guest houses), domestic activities, commercial activities (from boats in the harbour, shops, consumers, cafés), and from city level activities. The solid waste management practices that contribute to litter on the SE beach of Hulhumale' Phase II require better municipal services, improved regulation of waste management practices of vessels, and increased awareness of the community.

Keywords: Marine litter, waste characterization, plastic pollution,  
circular economy

*Sub-theme 3:  
Disaster Risk Reduction*

5





## Role of Broadcasting Media in Management of Natural disaster

*Hussain Waheed*

*Maldives Met Service*



### **Abstract**

The media plays an important role in all phases of the disaster. In social aspects, the media is a tool used to influence people's behaviour, awareness, and response to natural disasters. The Maldives is prone to natural disasters. The geographical location and its physical characteristics make it vulnerable to natural disasters. The 2004 tsunami was the most disastrous event in the history of the country. Apart from the tsunami, other natural hazards, such as severe weather, were experienced in the country on different spatial and temporal scales. After the 2004 tsunami, the broadcast media, especially TV channels, played a vital role in creating awareness about disasters and helping the community in all phases of disasters. The objective of the study was to understand the role of media in disaster communication and to know the preparedness of different media during and after disasters and their coverage. Finding out people's perceptions about broadcast media was also an objective of the study. The researcher conducted a public survey to find out the role of the media in disaster handling and information dissemination. Along with this survey, the researcher also talked to different broadcast media heads to know their preparedness in broadcasting information about disasters during all phases. In-depth information was collected to determine the capacity of the main broadcast TV and radio channels in the Maldives. There has been a significant increase in the number of broadcast TV and radio channels in recent years and progress in broadcasting in different contexts. The researcher's findings show that all broadcasting channels, whether public media or private media channels, have made remarkable progress in disaster broadcasting contexts. The researcher also examines some case studies of natural disasters and their handling by the media. Also, find out people's perceptions about media in disaster management.

*Key words: disaster broadcasting, media, perceptions, preparedness*

## Enhancing the Early Warning System in the Maldives: A Focus on Dissemination and Communication Strategies

*Azeema Ahmed<sup>1</sup>, Ahmed Aslam Waheed<sup>2</sup>, Sonath Abdul Sattar<sup>3</sup>*

*<sup>1</sup>Maldives Meteorological Service, <sup>2</sup>The Maldives National University,*

*<sup>3</sup>Ministry of Higher Education*



### Abstract

This paper examines the establishment and effectiveness of the Early Warning System (EWS) in the Maldives, with a specific focus on dissemination and communication. It explores how the Maldives Meteorological Service (MMS) initiated the process of establishing the EWS and implemented Standard

Operating Procedures (SOPs) to disseminate warning messages to the public and first responders. The study highlights the introduction of various communication mediums and the adoption of the internationally recognized Common Alerting Protocol (CAP). Additionally, it investigates the ongoing Early Warning Broadcasting System (EWBS) project and presents findings from an online qualitative survey that analyses the effectiveness of communication in the EWS. The survey gathers information on the frequency of receiving natural hazard-related information, the understanding and reliability of warning messages, and the accessibility and usability of alert messages. The results reveal the importance of facilitating public awareness by including impact information and precautionary measures in warning messages. The study emphasizes the need for effective communication to make early warnings accessible to all, thereby enhancing the EWS in the Maldives.

**Keywords:** *. Natural hazards, Warning messages, Accessibility, Usability, Early warning system*

## Tsunami Preparedness Geo-Database for Coastal Areas of Sri Lanka

*Pushpika P Masakorala<sup>1</sup>, Rekha Nilanthi<sup>1</sup>*

*<sup>1</sup>University of Peradeniya*

### Abstract



Sri Lanka was heavily affected by the tsunami of December 26, 2004, with over 30,000 people dead, almost a million displaced, and an estimated 150,000 people losing their primary source of livelihood. Geodatabases and GIS have become increasingly important for natural

disaster risk reduction, like tsunamis. The need for a systematic integrated approach to disaster preparedness and response systems will be very vital to minimize loss of life and damage to property. Although many institutions have tried to develop spatial databases and produce maps, a national-level spatial database for future tsunami risk management is not available. The objective of this research is to develop a spatial database schema for tsunami risk management in Sri Lanka. Data was collected from the administration boundary map of Sri Lanka and TIF maps of the 2004 tsunami developed by various institutions. The study identified the spatial and non-spatial information needs for database design for tsunami risk management. The data are categorized into three components: (i) pre-disaster baseline geographical data of the high-risk areas; (ii) 2004 tsunami data; affected areas and mortality attribute data, etc.; and (iii) real-time and post-disaster attribute data. The geographical data layers can be prepared before a tsunami, and these layers can be used in a real-time tsunami for quick decision-making. The geographical information layers are associated with attribute data in a quantitative and qualitative manner. The attribute data was stored in a database file, which is an integral part of the data layer. Pre-disaster baseline data is stored in the ArcGIS software to prepare the layers required for making quick decisions by combining Landsat image data such as damaged roads, areas, etc. The spatial database is developed at the micro level, and the procedure can be applied at the national level too.

*Keywords: tsunamai, GIS, disaster preparedness, disaster risk management*

**Efficacy of Social Capital vis-à-vis Financial Capital in terms of revivifying the livelihoods of rural flood victims: A solution for the implications of Global Climate Change scenarios on Sri Lankan Flood Disasters**

*Lasantha Manawadu<sup>1</sup>, Ananda Y. Karunarathne<sup>1</sup>,*

*<sup>1</sup>University of Colombo*

***Abstract***

Sri Lanka, as an Island country situated in the Indian ocean, has adversely been faced with a range of climate crisis-induced disasters. Hydrometeorological events are the predominant natural disasters that have been experienced in Sri Lankan nation for decades. These are mainly torrential rains, floods, landslides (wet), storms and droughts. Among all the Hydrometeorological disasters, mass flooding events can be identified/recognized as the serious disaster that has impacted the country for years. This is because many hundreds of thousands of people have experienced severe and more forbidding consequences from mass flood disasters. Especially, people who are living in down-valley areas of major rivers are flood victims. The situation has worsened in the areas that experienced such cascading disasters. In this context, this research sheds some light on investigating the efficacy of Social Capital vis-à-vis Financial Capital in terms of revivifying the livelihoods of rural flood victims of 2017 mass flooding events. The study considered, randomly selected 114 flood affected rural households which are situated in seventh Grama Niladari Divisions (GNDs) in Kuruwita District Secretariat Division (DSD) of Rathnapura District, Sri Lanka for the empirical data collection. A Household survey was conducted to collect social capital and financial capital data of selected flood affected households. General normalization procedure was occupied for processing the collected empirical data. The study considered the normative notion of social networks and monthly income of flood victims. Analysis of the results revealed that the social capital metaphors and their resource mobilizations have gigantically helped to revivify the livelihoods of flood victims. Of greater significance, the metaphors of social capital have been enhanced through the legacies of reciprocal

support networks, proving to be more effective in alleviating a spectrum of concerns and traumas stemming from floods as compared to their financial resources. The results of this study will be implicated on the extant literature for the resiliency research foci on networked disaster victims and on ongoing climate change related policy studies/implementations.

*Keywords: Social Capital vis-à-vis Financial Capital on disaster risk reduction; global climate change and mass flooding events; Sri Lanka.*

*Sub-theme 4:  
Medicine and Nursing*

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## Initial assessment of Inborn Error of Metabolic Screening in Government Referral Hospital, Maldives

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### Abstract

Neonates born with inborn errors of metabolism (IEM) are almost always asymptomatic. If left untreated it can result in significant morbidity and even death. Early detection and management are crucial to decrease health cost related to these conditions. It is critical to screen babies at birth for IEM. Primary objective of this study is to describe findings from neonatal metabolic screening done in government referral hospital in Maldives (Indira Gandhi memorial hospital) in the year 2022. Secondary objective is to guide policy makers in establishing a universal neonatal health screening program (UNHS) in Maldives. Data is analyzed from neonatal metabolic screening done in IGMH in 2022. These babies include those born in and outside IGMH. Dried blood spots from heel prick were used. Time-resolved fluoroimmunoassay technique was method used. The kits were Delfia kits from Perki Elmer. Annual total births in Maldives are at average of 6500. There were total of 2294 babies (35% of annual birth) tested in IGMH for 7 different metabolic disorders that include G6PD deficiency, congenital hypothyroidism, congenital adrenal hyperplasia, biotin deficiency, cystic fibrosis, galactosemia and phenylketonuria. There were 416 cases of G6PD deficiency with another 29 cases of borderline low. This makes 19.4% of tested cohort to have significantly low G6PD. There were also 18 cases (0.8%) of impaired thyroid hormone level, 6 cases of impaired galactose, 19 cases of significantly abnormal results for phenylalanine. There were no cases of abnormal trypsinogen, biotinidase and 17 hydroxy progesterone. Most common IEM in Maldives are G6PD deficiency and congenital hypothyroidism. Other significant diseases include phenylketonuria, cystic fibrosis and galactosemia. When establishing UNHS program in Maldives, it is important to base the conditions depending on the prevalence of disease in the country.

**Keywords; Inborn Errors of Metabolism, Maldives**

## **Factors associated with elimination of soil transmitted Helminths in the Maldives.**

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*<sup>2</sup>Ministry of Health, <sup>1</sup>The Maldives National University*

### **Abstract**

The aim of the study was to find out the effectiveness of the school-based deworming program by determining the prevalence and intensity of STH in children aged 2-14 years by identifying factors associated with Soil Transmitted Helminth (STH) infections. A cross-sectional survey consisting of 1432 participants was carried out. The study adopted a clinical component (examination of stool samples) along with administration of a questionnaire to the selected sample to determine the prevalence and intensity of the worm infestation in the population. The laboratory results show that the presence of STHs was not observed in most of the samples tested. *Trichuris Trichiura* was found in one stool sample from the one of the northern islands (Nolhivaram). Pin worms were found in three samples from one of the Southern islands (Isdhoo). The deworming program is effective in eliminating STHs in most of the parts of the Maldives. The current frequency of administration of deworming tablet in the school health programs needs to be revised to treat children with deworming tablets once a year according to WHO guideline.



## Association between vitamin D status and lifestyle factors in women

Zeba un Naher<sup>1</sup>, Punya Laxmi Manandhar<sup>1</sup>

<sup>1</sup>The Maldives National University



### Abstract

Vitamin D deficiency has been documented to be widespread, even in low-latitude regions, and this may be related to sun exposure behaviors. The current study sought to examine the relationship between serum 25-hydroxyvitamin D [25(OH)D] concentrations and lifestyle-related factors in different populations. Three databases (PubMed,

Google Scholar, EBSCO) were searched for articles covering the association between serum 25-hydroxyvitamin D [25(OH)D] concentration and level of exposure to ultraviolet radiation (UVR), smoking habits, alcohol consumption, and physical activity levels. Age, body mass index (BMI), and postmenopausal status. The Search time frame was within the last 7 years to get the most updated scientific evidence studies with vitamin D deficiency other than a total of 250 eligible articles was retrieved by authors. No matter their age or racial background, half a billion woman worldwide are at risk of developing hypovitaminosis D. Vitamin D deficiency can be brought on by several factors, including decreased synthesis, increased catabolism, or metabolic expectations, and increased urinary loss. Different articles show the evidence from observational studies linking vitamin D deficiency/insufficiency to an overall increased risk of acute respiratory tract infections as well as ongoing illnesses like osteoporosis, hypertension, cardiovascular disease, myocardial infarction, cancer, diabetes, and more recently, comorbid conditions. However, it is necessary to confirm whether the patient has significant risk factors for vitamin D deficiency, such as osteoporosis, osteomalacia, malabsorption, use of drugs that can affect vitamin D metabolism, or institutionalization, before indicating supplementation. likewise conducted on vitamin D and mood disorders in women that used both experimental and non-experimental designs raise the possibility that vitamin D may be a crucial nutrient for women's mental health in addition to their physical well-being.

## **Perceptions of leprosy in the Maldives: A study of knowledge attitudes and Practices**

*Sheena Moosa, Raheema Abdul Raheem, Nasma Yoosuf*

*The Maldives National University*

### **Abstract**

The aim of the study is to assess the knowledge, attitude, and practices regarding leprosy. A cross sectional survey of a nationally representative sample was implemented among the resident adult population (18 years and above) across the islands of Maldives. The survey sample size estimated was 1181 and a total of 1024 respondents completed the survey accounting for a response rate of 86.7%. The questions to measure indicators of knowledge, attitude and practices regarding leprosy were adopted from existing validated instruments used for leprosy KAP studies. The findings show a low level of knowledge with a mean of 3.5 in the KAP measure, where the maximum score is eight. However, the attitude and practices score does not indicate a high level of negative attitudes and practices (below the mid-point). The mean score of EMIC-CSS is 12, slight inclination towards less negative attitudes (EMIC-CSS scale scores ranges from zero = no negative attitudes, to 30 = most negative attitudes). The mean score of SDS is 8.9 indicating moderate level of negative practices (SDS scale scores ranges from zero = no negative practices to 21 = most negative practices). As Leprosy in Maldives is no longer a public health burden, and the disease prevalence is extremely low, it has created a situation where there is very little awareness and correct knowledge about the disease among the public as well as health care workers. The attitudes and practices from the family and community are not at alarming levels in terms of stigma and social distancing. However, the low level of knowledge raises the concern that cases may be missed and as patients may be missed as they may not seek healthcare for early diagnosis and treatment.

## **Knowledge of Pelvic Floor Dysfunction among Maldivian Females**

*Asiyath Saeed, Ammar Suhail*

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### **Abstract**

Pelvic floor dysfunction (PFD) occurs when the muscles or connective tissues of the pelvic area weaken or are injured. The most common dysfunctions are urinary incontinence (UI) and pelvic organ prolapse (POP). PFD negatively impacts these women's lives physically, mentally, and economically. The prevalence of PFD is under-reported mainly in developing countries with fewer females seeking health advice, indicating a lack of knowledge of PFD. Therefore, exploring the understanding of PFD among Maldivian women is imperative to establish a guide in designing educational initiatives for women with PFD. To determine the baseline knowledge of PFD among Maldivian females between 20 to 64 years. A cross-sectional survey was conducted among Maldivian females living in the Greater Male area. The sample size was selected via convenience sampling technique. The validated prolapse and incontinence knowledge questionnaire (PIKQ), a 24 items questionnaire was used as the research instrument to measure participants' knowledge of PFD. Sociodemographic questions and relevant questions were added to identify treatment-seeking behavior. 139 responses were received. Most participants were in the age range 30 to 39 (42.4%) while the least number of participants were from 60 to 64 (1.4%). The mean score of knowledge proficiency for UI and POP were 8.28 (3.3) and 6.81 (3.4) respectively. The mean score of knowledge proficiency of PFD was 15.09 (6.4). The knowledge of PFD among Maldivian females living in the Greater Male' area was found to be fair. Simple strategies can be utilized to further improve the knowledge via community health education programs which will aid in early treatment-seeking behavior.

***Keywords: Pelvic floor dysfunction, Women's Health, Pelvic Health, Health Promotion***

## Significance of CRP in Complicated and Uncomplicated Appendicitis

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*<sup>1</sup>The Maldives National University, <sup>2</sup> Indira Gandhi Memorial Hospital*

### Abstract

To determine whether there is a significant increase in serum C-reactive protein (CRP) levels in complicated and uncomplicated appendicitis patients. Retrospectively reviewed 167 patients from January 2021 to December 2022 at the Indira Gandhi Memorial Hospital (IGMH). All patients aged 6–59 years, who underwent emergency appendectomy for clinically diagnosed acute appendicitis were included in the study. Data was collected from the hospital databases. In addition, Clinical findings were used to calculate the Alvarado scores. Using Receiver Operated Characteristics (ROC) curve, inflammatory markers and Alvarado score were compared between complicated appendicitis (perforated, peri-appendicular abscess, or gangrenous appendix) and uncomplicated appendicitis (inflammation of the appendix in the absence of gangrene, perforation, or abscess around the appendix). ROC analysis was used to determine the cutoff value above which complicated appendicitis would most likely be diagnosed. There were 37 and 130 patients with complicated and uncomplicated appendicitis, respectively. There was a significant increase in CRP levels in acute appendicitis patients (82.6%). The mean CRP was significantly higher in the complicated group. The cutoff value of CRP was set at 5.94 mg/dl using the ROC curve, with 81.1% sensitivity and 76.9% specificity. Alvarado score is significant ( $p=0.032$ ) in complicated appendicitis, however CRP is superior to Alvarado score with  $p<0.01$ . CRP level is superior to other diagnostic markers in differentiating between complicated and uncomplicated appendicitis. CRP cutoff value of 5.94 mg/dl is statistically significant in diagnosing complicated appendicitis. This value should be used cautiously in conjunction with other clinical findings as more studies are needed to confirm these findings.

*Keywords: Acute appendicitis; Complicated appendicitis; Uncomplicated appendicitis; C-reactive Protein; Alvarado score*

## **Effectiveness of COVID-19 Vaccines against Delta Variant: The case of Maldives**

***Raheema Abdul Raheem<sup>1</sup>, Aminath Hudha<sup>1</sup>, Thaalooth Rasheed<sup>2</sup>  
et.al***

*<sup>1</sup>The Maldives National University, <sup>2</sup>USAID*

### **Abstract**

Drawing on previous research, this study aims to assess the impact of vaccines on the Delta variant specifically within the context of the Maldives. The study employs a retrospective design to analyze existing data and identify trends. The sample comprises comprehensive COVID-19 case datasets obtained from multiple databases, including those collected by the Health Protection Agency (HPA) from the initial reported case until the end of December 2021. Notably, the data highlights that the surge in Delta variant cases in 2021 occurred a mere three months after administering the first dose of the vaccine to more than two-thirds of the population, suggesting that a single dose was not effective against the Delta variant in the Maldives. However, with the administration of the second vaccine dose and the implementation of additional restrictions, a gradual decrease in the number of COVID-19 cases is observed in the Maldives. It is crucial to emphasize that WHO-recommended preventive methods should be implemented if cases start to rise, even in the presence of mass vaccination, as supported by studies conducted in other countries.

## Satisfaction of caretakers towards government's home visit program for bedridden patients in Greater Male'/Maldives: A descriptive study

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<sup>1</sup>Dhamanaveshi, <sup>2</sup>The Maldives National University



### Abstract:

Bedridden patients' home visit program by the government of Maldives has been operational since 2015 without an evaluation. The objective of the study was to assess the satisfaction level of caretakers towards government's home visit program for bedridden patients. A descriptive study was carried out during February to July 2022 of all the registered bedridden patients at the main urban primary health care centers in the Greater Male' region of the Maldives. 123 caretakers were interviewed using a 49 item instrument. The most common caretaker of the bedridden patients were the offspring of the patients (67%). Only 10% of the bedridden patients were taken care of by hired caretakers. The majority of the caretakers of bedridden patients were not trained (78%). The median score for the overall satisfaction on the home visit program and for the services provided by the program were found to be high at 10 out of 10 (IQR: 2) and 11 out of 14 (IQR: 7). However, the median score for the satisfaction on procedures and trainings conducted during the program was low at 2 out of 12 (IQR: 6) and 5 out of 10 (IQR: 8). The study found that caretakers appreciate the overall program, and were satisfied with the services such as drug prescription services, general consultations and examinations. However, satisfaction level was very low on the procedures conducted during the home visits and the trainings provided for the caretakers.

**Keywords:** Caregivers/caretakers, satisfaction, bedridden patients, home-visit program, Greater Male'

## **Pandemic and Moral Philosophy**

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### **Abstract**

In the face of pandemic outbreaks, the significance of moral philosophy emerges as a vital area of inquiry, exploring how moral values can guide us in navigating ethical challenges. Within the realm of health ethics, traditional ethical principles have long provided guidance in diverse medical scenarios, including abortion, euthanasia, organ transplantation, patient-physician relationships, and medical resource allocation. However, there is no precise ethical standard for the conduct that should be followed or the course of action to be done in an epidemic involving a virus with a high contagiousness level, such as the recently discovered coronavirus (COVID-19). Under the circumstances of a pandemic outbreak, physicians have to face some dilemmas, both critically and morally. In addition to the personal moral decisions taken by a medical practitioner in a developing country, s/he has to face administrative decisions taken by the hospital authority. Hence, a re-evaluation of ethical theories concerning medical policy becomes imperative, along with the global reassessment of ethical steps to effectively combat such an epidemic. This research will endeavor to shed light on the importance of integrating moral philosophy into the discussion surrounding pandemics. It aims to provide a comprehensive framework for ethical decision-making during health crises by investigating how moral values can offer valuable solutions.

## **Effect of obesity on developing surgical site infections: A study among post-operative patients in Indira Gandhi Memorial Hospital**

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*<sup>1</sup>The Maldives National University, <sup>2</sup>Indira Gandhi Memorial Hospital*

### **Abstracts**

The objectives of this study are to describe the Body Mass Index (BMI) profile of patients as per WHO categories and the status of Surgical site infection (SSI) and obesity in the study population. This cross-sectional analytic study was carried out among patients who had undergone surgery in the General Surgery department of Indira Gandhi Memorial Hospital (IGMH) from 28th May 2023 to 4th August 2023. All the patients included in the study consented for participation in the study and their height and weight were calculated prior to surgery. The surgical sites of the same patients were examined two days following their surgeries and classified as either SSI or healthy wounds. From the 45 patients included in this study, 40 (88.9%) patients were overweight or obese, 1 (2.2%) patient was underweight and 4 (8.9%) were normal. Out of these patients, 40 (88.9%) did not develop SSI. SSI was seen in 5 (11.1%) of the patients who participated in this study. Out of the patients who were overweight or obese, (12.5%) had SSI whilst (87.5%) of the obese patients had clean and healthy wounds following surgery. Patients with normal BMI did not develop SSI. Chi-square test showed that there was no statistically significant relationship between BMI and SSI ( $p > 0.05$ , Pearson's chi-square 0.7). T-tests showed that there was a statistical difference in the mean age between people who had SSI ( $65.4 \pm 5.7$ ) and who did not have SSI ( $44.9 \pm 15.7$ ). The group of people who had SSI had a significantly higher mean age ( $p < 0.001$ ). Linear regression tests also showed a significant association between age and SSI ( $p < 0.01$ , OR:0.4, CI:0.002-0.013). The results of our research provide evidence for the need of preventive programs targeting SSI in overweight and obese patients, as well as obesity within the general population.

*Keywords: Surgical site infection, obesity, post-operative, infection*



## Back pain Beliefs among Maldivian Adults

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### Abstract

Evidence suggests that people's attitudes and beliefs about low back pain influence their clinical outcomes. However, there is a scarcity of studies on the topic of back pain attitudes and beliefs in Southeast Asia. Therefore, it is imperative to understand Maldivian's attitudes and beliefs about low back pain to effectively allocate healthcare resources to address this public health concern and to optimize the clinical outcomes of patients suffering from low back pain. This research aimed to explore the attitudes and beliefs toward back pain among Maldivian adults. This study was conducted as a cross-sectional survey among the Maldivian adults residing in the Greater Male' Area. Attitudes and beliefs toward back pain were measured using the 10-item version of the Back Pain Attitudes Questionnaire (Back-PAQ). The questionnaire was completed by 419 people. Many participants were between 18 to 28 years old with 71% of the participants being female. Back pain was prevalent among the participants with 369 (88.5%) people having back pain. The average intensity of back pain in the studied sample was 5.34/10. Many people experienced back pain for less than 4 weeks (51.2%), and 34.1% had experienced it for longer than 12 weeks. 90.6% of participants believed the back to be a vulnerable structure, 32% were unsure of the connection between back pain and injury, 61% had unfavorable beliefs or were unsure about engaging in activities while suffering from back pain, 95.6% did not think that psychological factors could affect back pain, and the prognosis of back pain was perceived negatively by 82.5% of the population. The most prevalent unhelpful beliefs are that the back is a vulnerable structure, that psychological factors do not play a role in back pain, and that back pain has a poor prognosis. To provide a holistic approach to back pain management, steps must be taken to reduce the level of unhelpful beliefs and attitudes toward back pain. As a result, these findings must be considered when creating a back pain educational program.

## **Associations of Knowledge, Attitudes, and Practices of Doctors on Postoperative Pain Management: A Cross-sectional Study in The Greater Male'**

*Ziuna Zubair<sup>1</sup>, Asra Ismail<sup>1</sup>, Yasra Ismail<sup>1</sup>, Suha Ibrahim<sup>1</sup>, Mariyam Niusha Naseer<sup>1</sup>, Abdulla Ubaid<sup>2</sup>*

*<sup>1</sup>The Maldives National University, <sup>2</sup>Indira Gandhi Memorial Hospital*

### **Abstract**

Our study aimed to investigate the knowledge, attitudes, and practices (KAP) of doctors in perioperative care towards postoperative pain (POP) management in the Greater Male' Area. A cross-sectional study was conducted between May and July 2023 in three tertiary hospitals of Greater Male'; IGMH, ADK Hospital, and Hulhumale Hospital. Our study population was doctors who perform surgeries or manage POP. Stratified random sampling was used to select 134 participants from the three hospitals and data was collected through a self-administered questionnaire. Descriptive and inferential analysis was run in Microsoft Excel 365 version. Linear regression, independent samples t-tests and analysis of variance were performed between KAP and selected variables; designation, years of experience as doctors, age, and gender. According to the research findings, the respondents attained a mean score of  $15.28 \pm 2.48$  SD (out of 22),  $7.92 \pm 1.94$  SD (out of 12) and  $6.38 \pm 1.80$  SD (out of 9) for knowledge, attitudes, and practices respectively. The data revealed a positive correlation between knowledge and attitudes of the doctors, while their practice was unaffected with increasing knowledge. A significant negative relationship was found between doctors' years of experience and knowledge ( $B = -0.07$ ,  $R^2 = 0.039$ ,  $p < 0.05$ ). The difference in mean score of knowledge between the departments was significant ( $F = 3.31$ ,  $df = 113$ ,  $p < 0.05$ ), with the Anesthesiology department having scored the highest. The findings further revealed a significant difference in mean practice score between those who did and did not receive training on POP management ( $t(132) = 3.02$ ,  $p < 0.01$ ) The results of our study provide crucial insight regarding the need for proper and regular training among doctors in order to improve their pain management practices towards postsurgical patients.

*Keywords: Postoperative pain management, Knowledge and attitudes, Practice, Doctors, Greater Male'*

## Prevalence of musculoskeletal pain symptoms among undergraduate medical and allied health students at Maldives National University (MNU)

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*The Maldives National University*



### Abstract

The prevalence of musculoskeletal pain symptoms (MPS) is on the rise in both occupational and educational settings. It is commonly found that among various occupations, workers in the health sector have an increased risk of developing musculoskeletal pain symptoms. Similarly, the exposure risk among students enrolled in different medical and allied health courses is high. There is a need to assess the magnitude of the problem among students enrolled in medical and allied health courses in Maldives as well. To investigate the prevalence of MPS among medical and allied health course students studying at the Maldives National University. A cross-sectional survey was done among undergraduate students enrolled in medical and allied health courses at the Maldives National University. They were recruited using a stratified sampling technique. Participants completed a structured self-administered questionnaire which was based on the Nordic questionnaire. A total of 410 participants participated in the survey with 90.2% of the participants being females. The mean age of the participants was  $21.8 \pm 3.6$  years. Among the study respondents, 94.01% (n= 401) had experienced MPS in at least one body site at any time in the past year. Among students affected with MPS 66.23% (n= 382) said it prevented them from doing their daily tasks. A similar trend was observed in terms of MPS prevalence in the last 7 days with 80.92% (n= 388). Low back pain was found to be the most prevalent musculoskeletal pain, followed by neck pain and upper back pain. The study found a high prevalence of MPS among the respondents. The high occurrence of MPS and its impact on their educational and personal activities suggests that there is a need for strategies aimed at preventing and educating students about MPS.

**Keywords:** *Musculoskeletal pain, undergraduate students, MNU, Health Care Providers, Occupational health*

## Antimicrobial Resistance Patterns of Bacterial Isolates in a Tertiary Care Hospital in The Maldives: A Retrospective Study

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*The Maldives National University*



### Abstract

Antimicrobial resistance poses a significant and escalating global public health threat. However, there is limited knowledge about the specific situation in the Maldives. This study aimed to investigate the prevalence and patterns of antimicrobial resistance among common bacterial isolates obtained from clinical patient specimens at a tertiary care hospital in the Maldives. This retrospective study reviewed the records of bacterial culture and antimicrobial susceptibility testing conducted at ADK Hospital, a tertiary care hospital in the Maldives, over a two-year period from 2019 to 2020. Clinical specimens were processed according to standard microbiological techniques. Antimicrobial susceptibility testing was performed using the Kirby-Bauer disk diffusion method. Results: Among the 3,669 culture-positive samples, urine specimens constituted the majority (76.20%), followed by pus (19.20%) and eye swab samples (1.20%). Gram-negative organisms accounted for 51% of the isolates, while gram-positive organisms constituted 27.13%. *E. coli* was the most commonly isolated organism (38.40%), with 99.93% of these isolates originating from urine samples. Other frequently isolated pathogens included coagulase-negative Staphylococci (21.59%), *Klebsiella* (15.02%), *S. aureus* (13.22%), *Pseudomonas aeruginosa* (7.60%), and *Klebsiella pneumoniae* (4.17%). The isolated bacteria displayed varying levels of resistance to commonly prescribed antibiotics. *E. coli* demonstrated high resistance to ampicillin and amoxicillin, while coagulase-negative Staphylococci and *S. aureus* exhibited the highest resistance rates against penicillins. Conversely, *Pseudomonas* species exhibited the lowest resistance rates among all tested antimicrobials. This study offers valuable insights into the prevalence and patterns of antimicrobial resistance among bacterial isolates in a tertiary care hospital in the Maldives. The

findings highlight the urgent need for the implementation of robust infection prevention measures, enhanced antimicrobial stewardship programs, and strengthened surveillance systems to effectively address the widespread antibiotic resistance within the hospital and the broader community. Continuous monitoring of resistance trends, promotion of judicious prescribing practices among physicians, and increased public awareness are critical in ensuring optimal treatment outcomes and mitigating the impact of antimicrobial resistance.

*Keywords: Antimicrobial resistance, bacterial isolates, infection control, Maldives.*

## **Common Gram Positive and Gram Negative Bacteria Isolated from Intensive Care Unit of Indira Gandhi Memorial Hospital, Male', Maldives**

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To determine and isolate common Gram positive and Gram negative bacteria from high touch surfaces and to identify the most contaminated high touch surfaces in the intensive care unit (ICU) of Indira Gandhi Memorial Hospital (IGMH) of The Maldives. A total of 45 samples were collected over a 50 days' period. Which included the nursing station, patient bed, and patient surrounding. Sterile swabs moistened with sterile normal saline were used to collect samples from these surfaces, which were then transported to the School of Medicine multipurpose laboratory for analysis. Swabs were inoculated into sterile nutrient broth tubes and incubated, followed by inoculation onto three different solid culture media. Bacterial colonies were identified based on colony morphology, Gram staining and biochemical tests. Quality control strain was used as a control. Data was analyzed using Microsoft Excel and stored securely. Results: Among the 45 samples that were collected, 75.5% of them exhibited positive growth and a total of 37 bacterial isolates were identified, out of which 81.1% and 18.9% were Gram positive and Gram negative respectively. The most frequently isolated bacteria were coagulase-negative *Staphylococci* (CoNS) 51.4% followed by *Staphylococcus aureus* (*S.aureus*) 29.7%. The most common Gram negative bacterial species were lactose fermenting (LF) enterobacteriaceae 10.8%. Nursing station was the most contaminated surface which has a 100% positivity rate. Conclusion: High-touch surfaces in ICUs, including nursing station, patient bed and patient surrounding were contaminated with potentially pathogenic bacteria. This research marks the first study in the Maldives to identify common Gram-positive and Gram-negative bacteria on high-touch surfaces within the ICU of IGMH, providing valuable insights for further studies in this area.

***Key words: High touch surface, ICU, Maldives, Bacteria, Nosocomial infections.***

## Knowledge, attitude, and perceived barriers to medication administration error reporting among registered nurses in a private hospital in the Maldives.

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### Abstract

The failure to report medication administration (MAE) errors is a worldwide problem associated with patient safety. The first step towards increasing the reporting rate is recognizing nurses' attitudes toward errors and perceived barriers to reporting.

Hence, this study explores the knowledge, attitude and perceived barriers to medication administration error reporting from the nurses' perspective. In this descriptive, institutional cross-sectional study, a structured, self-administered questionnaire was distributed to 172 randomly selected nurses at ADK hospital, Maldives. Data analysis was done using IBM® SPSS Statistics (Version 26) and level of knowledge and attitude were categorized using Bloom's cut-off point. A total of 165 nurses participated in this study with a response rate of 95.93%. 87.8% of the participants had a good to excellent level of knowledge. 54.9% had a positive attitude towards reporting medication administration errors. 50.5% of the participants agreed or highly agreed to "Nurses could be blamed if something happens to the patient because of the medication error". The results showed a statistically significant, strong negative relationship between MAER attitude and perceived barriers to MAER,  $r(163) = -.801, p < .01$ ; and a statistically significant weak negative relationship between MAER attitude and perceived barriers to MAER,  $r(163) = -.187, p < .05$ . The findings revealed that all the participants possessed good to excellent levels of knowledge in MAE and that they had a positive attitude toward medication administration error reporting. Administrative factors related to MAE reporting and blame due to adverse events to patients were the top-ranked barriers to MAE reporting among the participants of the study. Efforts to enhance MAE reporting and creating a safe organizational culture and developing a trustable, fast, and convenient reporting system is crucial to eliminate these barriers.

## Patient Safety Culture Among Nurses Working in Hulhumale Hospital

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### **Abstract**

Due to the increasing number of adverse events, concerned healthcare organizations are facing challenges in addressing patient safety among healthcare workers. In addition, little is known about patient safety culture in the Maldivian context.

Therefore, considering the importance of patient safety culture to the patient's health outcome, healthcare organizations recommend assessment and evaluation of the level of patient safety culture and factors influencing patient safety culture. The objectives of the study were to determine the level of patient safety culture, explore the factors, and evaluate their relationship with patient safety culture. A cross-sectional study conducted at Hulhumale Hospital in Male City involved a descriptive approach. The study encompassed a total population of 184 nurses working at the hospital. Of these, 111 nurses from different departments participated in the research. The assessment of patient safety culture among these nurses was carried out using the Hospital Survey on Patient Safety Culture (HSOPSC), which also included inquiries about workload. The Hulhumale Hospital exhibits a positive response rate of 48.2% in terms of the overall patient safety culture, reflecting a relatively low level of patient safety culture. The various dimensions of patient safety culture ranged from 27% to 87.6%. The frequency of reported incidents scored the highest at 87.6%, while team collaboration within the units also received a strong score of 82.8%. The dimensions with the lowest scores, at 27%, were hospital management support for patient safety and the non-punitive response to errors, even though the frequency of incident reporting was recognized as a strong point. There was a notable distinction ( $p < 0.001$ ) in the total score for workload and patient safety, and a significant difference ( $p = 0.002$ ) was also observed in the frequency of incidents reported in the last 12 months and the non-punitive response to errors. The majority of patient safety culture dimensions



at Hulhumale Hospital demonstrated a weak score, indicating a lower level of patient safety culture. To establish a strong patient safety culture, it is imperative to reinforce the organizational aspects that show weaknesses. Policymakers and managers should accord the utmost importance to patient safety culture. Strategies aimed at enhancing patient safety culture should encompass interventions addressing workload management, both at the staff and organizational levels, including measures like suitable staffing arrangements and well-defined working hours. Additionally, fostering a culture of non-punitiveness among nurses to promote an environment devoid of blame is vital for facilitating effective incident reporting among the staff.

*Keywords: Workload, Educational level, working experience, working unit, working hours*

## **A review on Pedagogical content knowledge among nurse educators**

*Aminath Rinzy*

*The Maldives National University*



Pedagogical Content Knowledge (PCK) is a blend of content knowledge and pedagogy knowledge, which enables and enhances a teacher to facilitate teaching in a way learners achieve the objectives. Organisations governing employment analysis and practice have identified teaching as an essential responsibility of all.

The role of educators, no matter whether their audience consists of patients, family members, nursing students, nursing staff or other agency personnel, they must have a solid foundation in the principle of teaching and learning. Professional nursing standards of practice have been made that teach patients and educate other staff as part to deliver higher-quality nursing care. The aim of this literature review is to explore the need to transition in the nurse role as an educator from being a content transmitter to being a process manager.

The literature review implies the use of PCK is not just imparting instructor knowledge of didactic content, knowledge of specialized clinical content, or knowledge of nursing students; it is all those entities articulated together. Faculty are content experts but not yet experts in teaching. Relatively few nurse educators receive the formal graduate pedagogical training needed to smoothly transition from bedside nursing or advanced practice roles to the nurse educator role. Novice nurse educators who lack pedagogical preparation may experience frustration and failure. The transition, experience and formal teaching training in nursing education matters. Nurse educators would be retained in their job. Clinical nursing mentors can perform well on their role. The application of pedagogical content knowledge among nurse educators can enhance nursing education. Propose recommendations for formal pedagogical training among nurses and nursing educators.

The author has no conflict of interest in this study

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## **An exploratory study of the Maldivian children's holistic well-being: children's perspective**

*Leela Ahmed, Mariyam Laiza, Aishath Shehenaz Adam, Aishath Naila, Fathimath Ahlam Niyaz, Aishath Shaheen Ismail, Raheema Abdul Raheem*

*The Maldives National University*

### **Abstract**

The mental health and overall well-being of children are influenced by diverse factors spanning various aspects of their lives. School interactions, family relationships, and peer connections consistently play pivotal roles in promoting positive mental health. Additionally, factors such as physical health, nutrition, sleep patterns, economic conditions, safety, behavior, education, and physical activity contribute significantly to their holistic well-being within their family and social contexts. This study's objective was to discern the elements associated with the holistic well-being of Maldivian children. Employing a quantitative cross-sectional survey design, data was collected from 533 children aged three to 18, residing in the Maldives. The survey incorporated variables like 'daily activities,' 'physical engagement,' 'self-perception,' 'school experiences,' 'sleep patterns,' and 'nutrition.' The findings unveiled that 47.8% of children didn't spend time playing with friends or family beyond their homes, and 29.8% allocated less than an hour for such activities. Regarding emotional states, 11.4% reported feeling incredibly positive, 12.8% felt great, 31.8% reported feeling fine, 14.3% experienced boredom, 13.7% expressed a desire to be at school, and 11.1% wished to play outdoors. A notable 62.9% believed they consistently met parental expectations. About 49.6% spent over an hour on tuition, and 53.1% received seven to nine hours of sleep, while 69% doubted the nutritional quality of their diets. Around 60% indicated that spending time outdoors with family and friends would enhance their daily happiness. This study has substantial implications for policymakers, parents, caregivers, and communities, urging them to devise strategies that foster supportive nurturing environments and essential resources that foster children's happiness, facilitating their growth into content adults and the fortification of resilient communities.

## The intellectual landscape of Knowledge Base on Authentic Leadership: A Bibliometric Analysis

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<sup>1</sup>The Maldives National University, <sup>2</sup>Chulalongkorn University



### Abstract

This review illustrates the knowledge base on authentic leadership, including contributing authors, countries, and journals. This paper also aims to analyze this knowledge base's intellectual structure to identify key concepts. The authors used 1,274 published documents generated from the SCOPUS database to analyze the literature on authentic leadership. Bibliometric indicators such as authors, countries, and journals were used in the analysis. In addition, science mapping analyses such as keyword co-occurrence and co-citation were also performed using VOSviewer. The findings revealed that scholarly work in authentic leadership is rising. Furthermore, while the contribution from different world regions was observed, the emerging regions are Asia and the Middle East. The analysis identified that William L. Gardner and Bruce J. Avolio are the most significant contributors to the field. In addition, most publications came from *Leadership and Organization Development Journal*, *Leadership Quarterly*, and *Frontiers in Psychology*. Finally, it was found that literature on authentic leadership could be classified into five schools of thought, and keywords can be grouped into nine meaningful co-word clusters. This study contributes to the knowledge base on authentic leadership by creating an intellectual landscape of the existing literature. These findings could benefit researchers in exploring the most relevant and critical areas of authentic leadership.

**Keywords:** *Authentic leadership, Bibliometric analysis, Science mapping, Co-citation, Co-occurrence*

## Concept Analysis of the concept eHealth (Electronic Health)

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### **Abstract**

With endless innovations in technology, people became ubiquitous to the concepts of eHealth. The inception of the concept of e-Health is coalescing of two words which are 'Electronic' and 'Health'. Health as a mere absence of infirmity articulated with 'electronic meaning', a system of operations involving the flow of electrons and various devices submerging into technological advancements brought the concept of eHealth. The aim of this paper analyse the concept and, propose an operational definition of eHealth. The methodology used as the framework in this paper is Walker & Avant's steps in concept analysis, which were underpinned by Wilson's model of concept analysis. The attributes of eHealth identified are (1) Networking, (2) Connectivity and (3) quality of care. The antecedents influence these attributes: Accessibility to healthcare professionals, digital support and unmet healthcare need. Hence, followed by the consequences: Patient empowerment, equity of health care and lack of control over the role by health care professionals. Conclusion: eHealth is used contemporary to provide healthcare access for all. Understanding e-health components is made easier for patients, healthcare professionals, and informatics through this analysis, limited healthcare facilities have digitized patient records and data, and these proprietary systems are incompatible, resulting in duplicate procedures and data. This will, however, require a country-wide, government-led system given the privacy implications of having a central system. There is no conflict of interest of the author in this paper.

## Challenges of developing scholarship of teaching and learning: Action research in a university context

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*The Maldives National University*



### **Abstract**

Understanding the development of the scholarship of teaching and learning (SoTL) among university academics is challenging as it involves a range of aspects, including the nature of higher education workload. Initially, the research aimed at offering ongoing professional learning opportunities for academics to help them view teaching as a scholarly activity and develop their SoTL. This paper reveals the challenges of becoming a SoTL scholar in the context of higher education in the Maldives. The research adopted an action research process within three cycles, inviting academics to engage in scholarly activities to become scholars of their own teaching. A baseline survey was carried out with 70 lecturers prior to organizing professional learning opportunities for them. The findings of the baseline survey indicated that 90% of the participants were interested in working as co-researchers and being actively involved in developing research and publication skills. In the initial action research process, 14 participants agreed to work with the research team and voluntarily showed their keenness. However, as the project continued, the number of participants reduced to only five academics due to the challenges they faced with their workload issues. The findings have critical implications, advising on the importance of academics' active engagement in scholarly work to help them become scholars of their own teaching.

## Our World Our Future

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*The Maldives National University*



### Abstract

“Our World, Our Futures”, is an ongoing small-scale, cross-cultural participatory study project which explores what transformative environmental and global citizenship education might look like in primary schools across two contexts. The aim of the study is to explore how teachers can innovate curriculum through a flexible, cross-curricular approach and within the constraints of the existing formal school curriculum. Informed by a culturally situated, responsive approach for researching with students and teachers, the team developed learning activities which foregrounded the students’ situated knowledge’s, ideas, and concerns about the environment. The students were invited to create and share art and other texts about their perspectives on local environmental issues, their aspirations for their future spaces, and their active roles as global citizens. Teachers were invited to reflect upon how, and the extent to which, ideas of empathy, global citizenship and sustainability can be incorporated into the curriculum exploring how the project supported teachers’ pedagogical praxis, autonomy, and professional learning. The data generated from these activities were analysed by the research team, to identify ways students’ cross-cultural dialogue developed along with teachers’ pedagogical development in integrating transformative and contextually relevant pedagogical approaches with the existing curriculum. The findings demonstrate the complexities and challenges of collaborating across distances, cultures, time zones and using virtual platforms. Finally, it presents curriculum development as a lived, dynamic, and experimental process that develops teacher autonomy and promotes collaborative teacher research.

**Key words:** *global citizenship education, sustainability education, SDG4.7*



## What works in the Designing and Implementing a professional learning experience at MNU: A Facilitator Reflection?

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### **Abstract**

This paper will be focused on one of the professional learning experiences (PLE) which the facilitator has designed and implemented at MNU. The PLE was designed by adopting the ADDIE instructional design model and the guidelines for implementation were inspired by the adult learning theory principles. A total of 33 participants were enrolled in a Moodle page which included learning pathways, readings, learning tasks and assessments. The participants were invited to contribute to a discussion class where they need to follow before, during and after the discussion class activities with the help of a discussion planner. The duration of the PLE was 30 hours spread over the duration of six weeks. The findings of the author reveal that (1) the total duration and the end date of PLE should be decided by keeping in mind that the professionals might need extra time in completing the assessments; (2) The curation of the learning materials needs to be reconsidered based on the participants' learning needs, experiences and expectations. (3) To give a space for the participants to discuss and share their practices. (4) To communicate the facilitator's expectations verbally in the discussion class. (5) To come up with the mechanism to bring back the participants who feel that they cannot complete the PLE on the given duration.

***Keywords: Professional Learning Experience (PLE), ADDIE instructional design model, Adult learning theory, Moodle platform, Discussion class***

## Teaching Legal Research skills at Maldives National University: Law Academicians' perspective

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*<sup>1</sup>The Maldives Islamic University, <sup>2</sup>Bar Council of the Maldives,*

### Abstract



Legal research is an indispensable element of legal education and profession. There exist three major models viz frontload, integrated and online to teach legal research skills to law students. The purpose of the research is to explore the practices of the law academicians of Maldives National University in imparting the legal research skills to undergraduate and postgraduate law students. The study adopted a qualitative approach by conducting semi structured interviews with ten academicians currently teaching at the Faculty of Shariah and Law. Upon transcription, coding and analyzing the interviews the following results were achieved. Firstly, the academicians focus more on teaching legal research skills rigorously in the first year of the undergraduate degree programme and acknowledging its importance throughout the undergraduate degree programme. Also, most academicians appeared to emphasize legal research for the postgraduate programmed rather than the undergraduate programme. The study concludes that to effectively teach legal research the current practice must be modified, and legal research should receive equal attention both at the undergraduate and the postgraduate level.

*Key Words: Legal Research, Maldives National University, Undergraduate programme, Post Graduate programme.*

## Stories of principalship: Lessons learned by principals of two selected regions in the Maldives.

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*<sup>1</sup>The Maldives National University*



### **Abstract**

Developing a professional learning community (PLC) requires careful planning and arranging collaborative activities among the team members. This paper presents stories of several principals about what they have learned over the duration of a research project that principals were facilitated for their development of PLC. The research used a mixed-method approach using a sequential exploratory study design to explore how a PPLC can be established with principals. The research process involved working with 20 school principals across two regions of the Maldives. Principals also received ongoing professional learning ideas and several webinars focusing on improving their leadership practices. In the end, principals were engaged in focus group discussions on sharing their learning of the journey. They also collected their portfolio revealing their stories of accomplishments and dilemmas over the project period. Participant principals revealed that they were engaged in multiple tasks that helped them improve their leadership practices and student learning along with their sharing of knowledge among the team members. This research has great potential to improve leadership practices in schools. The paper also draws useful implications to enhance student learning as well as the professional learning of teachers.

## **English Medium Instruction in Technology Classrooms: Perspectives of First Year Undergraduates in Sri Lanka**

**Dinali Ariyasinghe**

*Gampaha Wickramarachchi University of Indigenous Medicine*



### **Abstract**

English Medium Instruction (EMI) is widely practiced in Sri Lankan Higher Education and specifically, it is evident in the degree programmes offered by disciplines such as applied sciences, medical sciences, technology, and management.

However, since most of the undergraduates who enter the state universities in Sri Lanka has completed their secondary education in vernacular languages: Sinhala or Tamil, those students encounter barriers due to the sudden transition to English Medium Instruction. Thus, this limitation in current language policy and planning in Sri Lankan education system has affected the students who must suddenly embrace a change in the medium of instruction. Hence, the present study is conducted in a Technology faculty of a Sri Lankan state university, with the objective of determining the perspectives of the first-year undergraduates in the change of medium of instruction and the effect EMI has on their academic activities in general. To gather data from the participants, questionnaires and interviews were utilized as research instruments in the present mixed-method study and the later the collected data was analyzed thematically. From the findings, it was evident that the participants face issues in comprehending lectures as well as in understanding the reading material given during the lectures. Further, participants claimed that because of EMI, various challenges occur in preparing and facing the evaluations and assessments of the modules. However, it was also found that irrespective of the language barriers faced by the participants, they are motivated to improve their English language skills since they understand the necessity of English in their academic activities and career prospects. Thus, it can be stated that though there are challenges in EMI, participants are willing to sharpen their English language competencies.

*Keywords: English Medium Instruction, Higher Education, Language Policy and Planning, Sri Lanka, Technology Undergraduates*

## Understanding How Contextual Factors Influence Direct Nature Experiences Among Island Children: Insights from A Mixed Method Study

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<sup>1</sup>The Maldives National University,



### Abstract

Increasing children's direct nature experiences (DNEs) is central to realizing a sustainable society. Substantial evidence demonstrates that trends in DNEs are underpinned by multiple contextual factors, often linked to children's everyday lives. Although scant evidence suggests a disconnection of present-day Maldivian children from nature, specific studies exploring this issue remain understudied. Therefore, a concurrent embedded mixed method study was conducted to investigate differences in DNEs and factors that influenced DNEs, as well as understand how contextual factors influence DNEs among 11–12-year-old Maldivian schoolchildren in different island environments. Results of the quantitative survey data (n = 429) demonstrated significant differences in the frequency but not in the variety of DNEs based on the island environment. The qualitative data from focus group interviews (n = 34) revealed that DNEs are determined by four broad contextual factors – *opportunities*, *preferences*, *constraints*, and *freedom*. This visualization was then analysed to identify possible associations between DNEs and contextual factors. The analysis suggests that *opportunities* contribute most to the significant differences in the frequency of DNEs, while *preferences* drive the variety of nature experiences. High *constraints* and low *freedom* may hinder the use of opportunities, especially in the less biodiverse capital area. It is clearly imperative to facilitate a variety of meaningful DNEs for children within the limits of their nature affordances to foster strong connections with nature. The findings have important implications for integrating DNEs into education for sustainable development programs, both formally and informally, as a step towards long-term biodiversity conservation and successful sustainable development. Future work that examines nature-based education at the school level is recommended.

## **“Who is the cleverest of us all?”: Motivation in the Maldivian schools.**

***Fathimath Ahlam Niyaz***

*The Maldives National University*



### **Abstract**

In Maldivian secondary schools, students learn in a competitive environment where student competency is defined by their grades, placing high regard to external motivational factors. Such extrinsic incentives in motivating students can be detrimental to student performance, as studies reveal high levels of extrinsic motivation can undermine the intrinsic motivation (Deci and Ryan (1985) which is the driving force for self-determination, personal well-being, enjoyment, self-fulfillment, academic achievement, and challenges needed for successful learning to take place (Liu, Hau, Liu, Wu, Wang, and Zheng (2019). Hence, the need to identify the extent of external motivational strategies employed by Maldivian Secondary School teachers is needed. This research aimed to examine the extent to which Maldivian teachers use extrinsic forms of motivational categories: external regulation, introjected, and identified. The study was carried out using an online survey method with a sample of 1407 secondary school teachers across the nation. Data was collected utilizing the Academic Motivation Scale (AMS-HS 28) for High School students, developed by Vallerand, Blais, Brière, & Pelletier (1989), which was based on Deci & Ryan’s Self Determination Theory (1985, 2001), and was adapted to Maldivian teachers for the current study. The results of the study were analyzed using SPSS software. Any missing values were replaced using the expectancy maximization method. The results revealed approximately 99% teachers used high levels of extrinsic motivational strategies to enhance student motivation in all three categories. Our findings suggests that the high use of external goal orientations may be the case for low success rates observed in a great majority of secondary school leavers.

## Improving Writing through Self-Directed Language Learning

*Dinali Ariyasinghe*

*Gampaha Wickramarachchi University of Indigenous Medicine*

### **Abstract**



In English as a Second Language (ESL) classrooms, students usually struggle in improving their writing competency. Various factors such as issues in the organization, grammatical accuracy, and lack of knowledge in vocabulary contribute to the matter, which adversely affect students' confidence and motivation in language learning and language production. Thus, to eradicate the identified issue, ESL teachers can introduce novel approaches to improve the writing skills of the students. Hence, through this study, the effectiveness of implementing Self-Directed Language Learning (SDLL) to improve students' writing competency was investigated. In this mixed-method study, a pre-test, a post-test, and a questionnaire were used as research instruments. Further, the participants of the present study were students who were following an ESL course at a Sri Lankan university. To conduct this study, a Computer Assisted Language Learning (CALL) platform was developed as an SDLL tool. Then, a pre-test was given to the students addressing one writing lesson, prior to implementing the SDLL tool in the classroom. Thereafter, the SDLL tool was introduced in the classroom and participants were given instruction on using the tool to improve their writing skills. Finally, two weeks after the introduction of the SDLL tool, participants were given a post-test, to test whether their writing competency has improved, because of SDLL implementation. Further, a questionnaire was provided, to gain an in-depth understanding of the effect of SDLL implementation. Thereafter, the gathered quantitative data was analyzed using SPSS whereas the qualitative data was thematically analyzed. From the findings of the present study, it was evident that the implementation of the SDLL tool was beneficial for the participants to improve their knowledge in writing. Therefore, it can be concluded that the implementation of SDLL has a greater impact on enhancing learner autonomy in ESL classrooms

## Exploring Research Culture: Analyzing the Scholarly Landscape using Edgar Schein's Model of Organizational Culture

Fathimath Muna<sup>1</sup>, Aishath Waheeda<sup>1</sup>, Asokan Vasudevan<sup>2</sup>

<sup>1</sup>Islamic University of Maldives, <sup>2</sup>INTI International University



### Abstract

Recent expansion of Higher Education in the Maldives leads to the creation of many Higher Education Institutes (HEIs). In addition to the teaching aspect, some of the HEIs have led new developments in research. Therefore, the purpose of this paper is to explore the research culture through the lens of Edgar Schein's

Model of Organizational Culture. The study used a qualitative approach based on case study design. Data was collected using semi structured interviews from 5 research heads and 10 lecturers from all 5 HEIs in Maldives which have a research unit. Participants were selected purposively based on their involvement in research work. Documents available from the institutions and participants interviews were used to triangulate the data. The findings were generated using thematic analysis method. The findings revealed that the HEIs share characteristics of the three different levels of Schein's organizational cultural model, namely, artefacts, espoused values and underlying assumptions or beliefs. As artefacts, research units, publications, activities, conferences, and technology exist in the institutions. Verbal communication, policies, SOPs, staff, and institutional growth were found to be as espoused values. At the last level, as underlying assumptions, perceptions on research and mismatch of skills were found to be present in these HEIs. Considering the findings, the study concludes that there is a long way to go for the HEIs to establish a progressive research culture. It could be argued that these HEIs are trying to communicate the importance of research for the growth and development of the staff, which will lead to the development of the institutions. The HEIs are trying to promote a research culture by providing opportunities and encouraging open dialogue.

*Keywords: culture, higher education, research, Schein's Model of Organizational Culture*



## Transition from KS3 to KS4: How Far KS3 Education Is Helping the Transition Seamless?

**Mohamed Abdulla**

*National Institute of Education*



### **Abstract**

There is a tendency among many stakeholders of the education system of the Maldives to oversimplify the issues in the students' transition from primary to secondary grades. Schools addressing the transitional issues by conducting simply a "career guiding session" just to give information on selection of stream and related job opportunities is valid evidence for the above-mentioned claim. However, a sharp drop in students' performance in the KS4 examinations seems to signal that there are serious transitional issues still to be addressed. No research has been done to understand the issues related to KS3 to KS4 transition in the Maldivian schools. This research therefore attempted to fill this gap by adopting qualitative approaches in gathering and analyzing the data from the teachers and students of two schools. From each school, 10 students from grade 8, and 5 science stream students and 5 business stream students from grade 9 were chosen for the interview. As for the focus group interview of teachers, from each school, at least a teacher for business studies and science from the last year of KS3 (grade 8) and a teacher from business stream and science stream of the first year of KS4 (grade 9) were chosen. The research revealed that there are structural issues and operational issues of the curriculum to be addressed to streamline the transition. Although there are some benefits associated with the structural change made in the new national curriculum to introduce designated subjects to teach the fundamentals of business and science stream subjects in KS3, students still face challenges of taking informed decisions on stream selection and estimating the academic workload of each stream in KS4.. Therefore, KS3 teachers tend to skip some contents and KS4 teachers tend to start from scratch the GCE O level contents the students already have studied in KS3 which give a chance to question about the significance of KS3 Business Studies and Science.

## A Development of Enrollment Management Integrated Model for the Private Colleges of the Maldives

*Imad Salih*

USIM



### **Abstract**

The purpose of this study is to identify the current enrollment management practices and models used by the private colleges in the Maldives and develop an integrated enrollment management model that could be utilized by the private colleges in the Maldives. The researcher employed interpretive and qualitative research design to collect data related to enrollment management practices, and models available in the private colleges of the Maldives based on the experience of enrollment management related staff with in-depth individual interview as the main source of research data. A total of 5 participants from each of the 4 private colleges purposively chosen for this study were interviewed via face-to-face to collect data. Document analysis focused on enrollment reports, enrollment plans, college websites, college strategic action plans etc. The current private higher education institutions have become extremely focused on redefining student enrollment management strategies to take full advantage of the resources of the institutions. An institution's optimum enrollment can be represented by the figure that indicates revenues and expenditures are in balance and is in between the maximum and minimum fiscal and physical capacity of the institution. The research will ultimately provide substantial contribution to the body of knowledge on strategic enrollment management private higher education. Future researchers should be able to use the findings of this study to determine how to improve enrollment management of small and developing private higher education systems through the development of new models for integration of various enrollment functions of private colleges.

*Keywords: Enrollment Management (EM), Strategic Enrollment Management (SEM), Strategic Enrollment Management Model (SEMM).*

## Higher Education for Sustainability in a Small Island State: A Case Study of Maldives.

**Mohamed Shareef**

*The Maldives National University*



### **Abstract**

Sustainability is a subject of importance to the Maldives, because of the urgency of the ecological, social, and economic challenges the world is facing today and the vulnerability of the Maldives. Long-term sustainable development can be achieved only if individuals and societies change the way they think and act. Education is key to achieving this transformation. This research examined academics and students' dispositions, abilities and behaviour towards sustainability and their experience of Education for Sustainable Development (ESD) in the context of one institute of higher education in Maldives. At the time of this research, there is no extant literature concerning higher education for sustainable development in Maldives. Study design involved detailed, in-depth data collection to explore academics and students' perception and engagement with ESD. Social constructionism, critical theory and the dispositions, abilities, and behaviour (DAB) framework provide the theoretical foundation for the study. The result of this study suggests that sustainability is not embedded throughout the degree programs of the institution in a holistic manner. Environmental dimension of sustainability is most frequently represented in the curricula. Discrepancies exist between different faculties in terms of opportunities for students to learn and engage with sustainability. Limited understanding of sustainability, lack of collaboration between faculties, increased online teaching, and financial constraints were perceived as challenges for academics and students to engage with sustainability education in a meaningful way. This research suggests that the current strategy being used by the institution to meet the self-funding domain is creating space where it is harder for students to engage deeply with pedagogies that would strengthen their skills and knowledge for sustainability.

## **International Collaboration in Higher Education: A Regional Approach for South Asia**

**Muhammad Ullah**

*Jahangirnagar University*



### **Abstract**

The prosperity of a nation largely depends on the degree of the human resource utilization. The national goal of a country determines its organizational pattern and the required qualities of the resource personalities. To ensure qualified human resources quality education and training is a prerequisite. The expected outcome of education is directed to fulfill the national goals. This direction can be represented in a goal-achieving approach to actualize the national visions within a particular region. Functionalism, especially in education, which focus on the role of education to serve the needs of society through the development of skills, and excellence and encourages social cohesion, can be instrumental in developing such an approach. In this approach, the concept of nation and that of a region are not in diametrical opposition, as they are often seen when it comes to the discussion of nationalism and regionalism. Here, nations are integral parts of the geo-cultural regions we live in. Hence, nation-building is also imperative in building the region. In the same way, dealing with the common regional problems and solving them is essential in building nations in a regional set-up. As South Asia has common socio-economic problems, cultural similarities, and political structures, a collective force through regional cooperation in higher education may be more effective to address those issues. A close connection of the universities in South Asia may develop knowledge and expertise through the exchange, collaborative research, sharing and developing curriculum etc. Our research attempts to develop such an approach and model using the functionalist theories. The qualitative research methods will be employed to that end. This research may promote current educational output to an unprecedented measure which could create a new region with a new outlook.

**Keywords:** *Collaboration, Higher Education, Regional Approach, Functionalism, South Asia*

## Distance learning and e-learning for maritime studies

*Mohamed Zaid*

*The Maldives National University*



### **Abstract**

E-learning has a long relationship with the shipping industry having been utilized as a mode of training by shipping companies which were mostly short-duration “value-added courses” offered by training providers such as the Ocean Learning Platform. The objective of this paper is to examine the requirements of the International Maritime Organization’s (IMO) Standards of Training, Certification, and Watchkeeping (STCW) convention about distance education, and e-learning. Furthermore, to analyze how widely e-learning and distance learning is used to train present-day maritime personnel and see how effectively learning management systems can be used for distance learning and e-learning for maritime education. A systematic review of IMO Standards of Training, Maritime Training Insights (METI) Database 2021 Training Practices Report, Google Scholar, and Maritime Commons, World Maritime University was carried out to answer the objectives. The IMO addresses the use of distance learning in the STCW Code B-1/6(6) which states that parties may allow the training of seafarers by distance learning and e-learning in accordance with the STCW convention. According to METI, 63% of METIs used face-to-face teaching despite the presence of the Covid-19 pandemic, e-learning using internet-based sources was used by 38% of the METIs and 51% of the METIs used Simulation. Simulation as an e-learning mode grew 37% in 2021 from the previous year and a further 58% growth is forecasted for 2022. The use of a Learning Management System (LMS) at a state University in Russia is described which is based on the Moodle platform and outlines the STCW compliance levels in the LMS. Educational needs are changing in the maritime industry as well and distance learning has become a key mode to spreading knowledge and fostering the understanding of key maritime issues for students and maritime professionals around the world. (IMO, 2022)

## Improving 3D Geometry Learning at secondary School

*Mohamed Shihab*

*The Maldives National University*



### **Abstract**

Three-dimensional geometry learning is a challenging part of secondary mathematics learning. Including the visualization, construction, and reasoning (Duval) in the learning process provides greater opportunity for better understanding of the 3D geometry concepts.

The geometric concept building should start from the very basic hierarchy of geometric points (0D) to lines (1D) to planes (2D) to solid objects (3D) for a comprehensive understanding of the shape and space students learn at secondary schools. This paper reports findings from a classroom experiment, in which 9th grade (age 14-15) students work through numbers of 3D geometry problems, which was challenging to them. The students' reasoning about the 3D shapes were analyzed based on a framework of levels of 3D geometrical thinking. The result shows that lower level of 3D geometric thinkers is unable to manipulate the 3D shapes effectively. On the other hand, those operating at higher levels can manipulate 3D shapes in a controlled manner and reason accurately.

*Key Words: 3D geometry learning, geometric thinking, levels of 3D geometric thinking, secondary school, Classroom experiment*

## Seven years of struggle: why schools were unable to implement key competencies properly.

*Mohamed Abdulla*

*National Institute of Education*



### **Abstract**

Since 2015 the schools of the Maldives are mandated to focus on teaching key competencies and reporting the progress of the key competencies to the students and parents in a similar way of reporting the content knowledge of the subjects. The aim of doing this is to develop 21st century skills of the students. However, the findings of the school review report of the Quality Assurance Department reported that 43% of the schools need to improve delivering of key competencies. This research aims to find the reasons for schools not being able to implement key competencies adequately. Aiming to achieve this, the research collected data via documentary analysis and observations. The research revealed that there are serious issues in planning and implementing the lessons. First, schools do not have proper plan in implementing the key competencies. Second, teachers tend to write the major aspects of the key competencies rather than writing the specific outcomes/indicators of the main key competencies. This makes difficult for the teachers to focus on it during the lesson. Third, teachers' pedagogical approaches do not create opportunities for implementing key competencies in the regular teaching. Fourth, most of the times, teachers do not teach key competencies purposefully but leave it to happen in the classroom making it less impactful. Finally, teachers do not make conscious efforts on assessing the key competencies and giving feedback. The research revealed that, to implement key competencies better, schools should make a proper scheme of works for the key competencies and teachers, through lesson panning and delivering, need to make purposeful efforts on implementing key competencies.





## Student Engagement in Online Learning Environment during COVID-19 Pandemic: A Systematic Review

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### **Abstract**

Almost all the daily activities were affected by COVID-19 Pandemic, and education was one among them. The immediate shift from traditional face-to-face teaching and learning to online learning leaves no time for educators as well as students to get familiar with the new modality of teaching and learning. The new normal practices such as shutdowns and lockdowns, and isolations and quarantines forced educators to adapt to the new approach and implement new tools. This study aimed to systematically review the literature on the impact of the pandemic on student engagement in online learning environment during COVID-19 Pandemic, focusing on the benefits and challenges of online learning environment on student engagement. Additionally, the most preferred tools for student engagement in online learning environments during the pandemic. Published papers that were focused on student engagement in online learning environments concerning the pandemic were searched and obtained 36 papers to include in the review. The PRISMA technique was used for the review, and qualitative approach was applied in the data collection process. The essential advantage recognized was that online learning environments were convenient and easily adapted by students during the pandemic, with the main challenge being connectivity issues and failure to adapt to the new, non-traditional methods. For the most preferred tools, Google Cloud proved to be popular because it has several tools that include Google Meet for distance learning, Google Forms for quizzes, Google Docs and Slides for collaborative works and Google Drive for sharing files. The findings from this review provides an insight into how universities adapted to a complete shift from the physical classroom setting to using fully online learning environment using various LMS tools and how that affected the student engagement during the pandemic.

*Keywords: COVID-19 pandemic; digital tools; learning management system; online learning environments; student engagement*

## **Instructors Readiness to Teach eLearning in Higher Education**

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### **Abstract**

Electronic learning (e-Learning) is becoming ubiquitous in the current practice of higher education. The use of e-Learning resources, such as LMS (Learning Management System) and the unified tools provides immense power to the learners as well as to the instructors to be successful in their learning. This mixed method study aimed to gain insights of the instructor's readiness to teach in eLearning in higher education courses. Data gathered from the 22 participants of the targeted subject, Educational Technology and Blended Learning in Higher Education in the Post Graduate Diploma in Higher Education conducted at the Faculty of Education of MNU (The Maldives National University), using a survey, semi-structured interview, and students' final exam results. The survey and interview focus on the five specific areas of e-Learning, namely ICT skills, digital communications, use of LMS, online course design skills and online teaching delivery. This study provides vital information on enhancing educational technology courses, specifically in the context of higher education institutions targeting lecturers/instructors' competency and readiness to use educational technology and deliver e-Learning programs. Based on the preliminary findings of the study, lecturers who completed the subject showed high confidence in their ICT skills, digital communication skills, online course design skills and use of LMS. However, the online teaching delivery area needs greater attention and requires further opportunities for the lecturers to practice the skills learnt in the subject. The survey result shows that more than 83% of the lectures are confident on the skills gained in the subject.

## **A Needs Analysis for English as a Foreign Language Instruction for Thai Senior Secondary School Students with Hearing Impairment**

*Sasa Watanapokakul*

*Mahidol University*

### **Abstract**

Currently, English plays a crucial role in many countries, including Thailand. In the case of students with hearing impairment, English instruction is different from that of ordinary students, due to their physical limitations. Also, hearing impaired students have different and specific needs for English as a Foreign Language (EFL) instruction. To design and develop an EFL course for them, information (from 68 questionnaires completed by Thai senior secondary school students at two schools for the deaf in Bangkok, Thailand, and 15 stakeholders; interviews of eight randomly selected senior secondary school students with hearing impairment and six stakeholders; and eight structured classroom observations at two schools for the deaf in Bangkok) was quantitatively and qualitatively analyzed and finally reported. The findings revealed a wealth of both implications and recommendations for developing an EFL course for Thai senior secondary school students with hearing impairment.

*Key words: needs analysis, English for students with hearing impairment, English as a foreign language (EFL), special education, mixed method, triangulation.*

## Addressing Academic Integrity in the Age of Artificial Intelligence: Instant Reactions of HEIs on AI Detection Tools

*Ruwan Gamage*

*The Maldives National University*



### Abstract

The increasing use of artificial intelligence (AI) technologies, particularly AI-generated content in higher education, poses significant challenges to academic integrity. This abstract explores the insights higher educational institutions (HEIs) provided in tackling this issue in the wake of the Turnitin plagiarism detection tool introducing AI detection in April 2023. The main objective of this study was to understand how HEIs consider the impact of AI on academic integrity. The author surveyed how HEIs reacted to the rise of AI use and the Turnitin plagiarism detection software's recent inclusion of AI detection. The author executed two search queries on Google search engine. The searches were conducted on 22<sup>nd</sup> May 2023. All results were included in the sampling frame. Results, which had no information on university-wide policy-level instructions or decisions, were excluded. ChatGPT version 4.0 (2023 May 12 version) was used to efficiently summarize content from Web sites. Statements from 31 HEIs were analyzed. HEIs who had reported their concerns on official Websites were mainly from USA, Australia, and Turkey. They are dealing with the growing impact of generative AI tools like ChatGPT on education, emphasizing the necessity for academic integrity measures. All institutions think it is too early to decide on student academic misconduct based on AI detection data. Some institutions have emphasized the right to check work for AI usage retrospectively. However, they stress the importance of citing AI tools in academic work to maintain integrity and avoid misconduct allegations. Despite AI's transformative potential in education, universities advocate for a comprehensive approach to detect academic dishonesty and encourage responsible AI use, considering ethical, legal, and policy aspects. While helpful, Turnitin's AI detection tool should not be the only basis for determining academic misconduct.

## Is there a Mismatch between the Intended and Implemented Curriculum in the Maldives? An Exploration of Classroom Practices among Teachers of Key Stage 1 and 2

*Shuhudha Rizwan*

*National Institute of Education*



### **Abstract**

The National Curriculum in the Maldives envisions the development of confident, competent and responsible individuals who are adequately prepared for life in the 21st century. The curriculum anticipates that every lesson or learning activity will bring students closer to this vision by providing authentic learning experiences that motivate all students to learn, encourage critical and creative thinking, develop self-management skills and cultivate positive relationships. The purpose of this study is to explore the extent to which teachers of key Stage 1 and 2 in selected schools of Maldives implement the National Curriculum as it is intended. Qualitative methodology was adopted in this study, conducting 40 classroom observations across 10 selected schools in Maldives. The teaching behaviors that were observed were then subjected to thematic analysis to extract meaningful patterns and insights. The findings revealed a significant gap in the pedagogical practices used in the classroom when evaluated against the National Curriculum's vision of preparing students for life in the 21st century. It was found that very little focus is given to make learning meaningful and authentic for students. It was also found that while teachers exert sincere efforts to incorporate key competencies and shared values into their lessons, the depth of this integration was found to be relatively superficial. The study concludes to draw potential for a significant transformation in teachers' pedagogical practices through the incorporation of key competencies as pedagogy of classroom teaching. Consequently, the study also recommends targeted training and support for teachers to create and carry out more authentic learning activities.

*Keywords: Pedagogy, 21 century learning, curriculum implementation*

## Thai engineering students and their English literature journey

*Thanis Tangkitjaroenkun*

KMUTT



### Abstract

At King Mongkut's University of Technology Thonburi, Bangkok, Thailand, engineering students are required to complete 9 credits of English courses: English I, English II and ESP-related subject. Given the nature of their field of study, it is not too far-fetched to say that English literature is not a popular subject and tends to be overlooked. Nevertheless, many studies have widely discussed the benefits of literary studies that EFL students can gain. To encourage our students' lifelong, sustainable skills and to develop their critical thinking skills through English literary texts, the course Reading Appreciation was created in 2011. In this presentation, the course structure, the content, the students' written assignments and the students' reflective journals will be used to pinpoint how English literature can enhance the students' English skills and widen their perception towards society and the world at large. It is hoped that the findings of the study will have an impact on EFL educators and policy makers especially in countries, Thailand included, where English is merely seen as a tool for economic efficiency.

## To study the impact of Data science in education sector

Tejashree Sagaonka<sup>1</sup>, Monica Apte<sup>1</sup>

<sup>1</sup>MIT- WPU

### Abstract

Data science is the study of how to extract knowledge and insights from data. In education, data science can be used to improve student outcomes, personalize learning, and make better decisions about curriculum and instruction. Predicting student performance: Data science can be used to predict which students are at risk of failing. This information can then be used to provide those students with additional support. Personalizing learning: Data science can be used to personalize learning for each student. This can be done by recommending different learning materials, activities, and assessments based on each student's individual needs and interests. Improving teacher effectiveness: Data science can be used to track teacher performance and identify areas where teachers can improve. This information can then be used to provide teachers with professional development opportunities. Data science is a rapidly growing field, and its applications in education are only just beginning to be explored. As data science continues to develop, it is likely to have an even greater impact on education in the years to come.

*Keywords - Data science, Student, Education sector, Learning*

*Sub-theme 6:*  
Language, History and Culture

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## **Exploring nature-related conceptual metaphors used to depict beauty in Maldivian lyrics**

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### **Abstract**

The objective of the study was to explore the experiences of five decades of development at the National Teacher Training Centre, JIPMER. A critical analysis was done by reviewing various documents and doing a situation analysis. The results showed that India's growing number of medical schools in the past two decades has created challenges in medical education, including a lack of trained teachers. Faculty development (FD) helps teachers become more aware of their professional responsibilities. The National Teacher Training Centre (NTTC) at the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, plays a vital role in FD by improving the quality of medical training by training teachers in educational technology. The NTTC was established in 1975 with WHO aid to promote training in educational technology and research in medical education and is now functioning under the aegis of the Department of Medical Education at JIPMER. The DME has grown and implemented various successful medical education programmes in India. The DME recognises the importance of innovation and improvement in the rapidly evolving field of medical education. It seeks international partnerships to broaden its scope of activities. This abstract provides a thorough overview of the crucial role that the NTTC and the DME played in reviving medical education through faculty development and creative partnerships, ultimately contributing to the advancement of medical pedagogy in an ever-evolving landscape.

*Keywords: DME, innovation, improvement, international partnerships*

## **Guardians of History: A Case Study on the Operational, Legal, and Organizational Infrastructures of the National Archives of Maldives**

*Fathimath Nashfa, Ajra Rafeeq, Aminath Nasiha, Thuzuhath Ahmed, Ruwan Gamage*

*The Maldives National University*



### **Abstract**

Established under the Archival Act 16/2011, the National Archives of Maldives (NAM) is responsible for preserving national official records and formulating archiving policies. The objectives were to understand the operational protocols, legal and policy foundations, and the organizational chart in influencing the performance and reliability of the institution. The study comprised a study tour of the National Archives record room and discussions with the key officials of the Records Management Section, including the Director. Through detailed examination, we have elucidated the strengths and weaknesses of the current archival system, identified potential areas for improvement, and illuminated such institutions' role in preserving and disseminating a nation's cultural and historical heritage. The Act details NAM's responsibilities for acquiring, appraising, and preserving historically significant records, managing records transfers, and facilitating public access. It requires official documents to be retained for 25 years within institutions before being transferred to NAM, with records predating 1980 preserved permanently. A policy of disposal is also in place for inactive records. The Act establishes the NAM's organizational structure, overseen by a Director General and an advisory board. Despite the NAM's mandate, it currently faces challenges such as space limitations, lack of standard transfer procedures, and lack of professional archivists, which prevent it from acquiring new records. Recommendations include establishing operational procedures for records acquisition, obtaining a larger archival building in or outside Male', professional archivist training, and better utilizing the existing preservation chamber.

*Keywords: National Archive of Maldives; Archives Act; cultural heritage; archival policy; digitization*

## Coastal Cities in Conversation: A Comparative Study of Architecture and Cultural Influences in Male, Maldives, and Alexandria, Egypt

*Sarah A. Elgezary*

*The Maldives National University*



### Abstract

Coastal cities have long served as centers of cultural exchange and architectural evolution, shaping the identities and narratives of their respective regions. This research presents a comparative study investigating the interplay between architecture and cultural influences in two coastal cities: Male, Maldives, and Alexandria, Egypt. By examining the architectural styles, historical contexts, and cultural dynamics, this study aims to shed light on the similarities and differences that exist between these two geographically distinct locations. The research employs a multidisciplinary approach, combining architectural analysis, historical research, and cultural studies to explore architectural expressions and cultural influences. Architectural styles and typologies prevalent in both cities are examined, considering factors such as geographical context, historical developments, socio-cultural interactions, and the impact of external influences. Additionally, cultural elements, including art, literature, religion, and traditions, are studied to identify the cultural influences shaping the architectural landscape of these cities. Preliminary findings reveal intriguing parallels and connections between Male and Alexandria. Both cities exhibit influences from their respective histories, with Male reflecting a fusion of indigenous Maldivian, Islamic, and colonial architectural elements, while Alexandria showcases a blend of ancient Egyptian, Greco-Roman, Islamic, and modernist influences. Furthermore, coastal factors such as climate, maritime trade, and cultural exchanges with neighboring regions have contributed to the development of unique architectural and cultural identities in both cities. This study contributes to an understanding of the interrelationships between architecture and culture in coastal cities. The findings highlight the significance of historical, geographical, and cultural factors in shaping the built environment and cultural expressions of cities.

**Keywords:** coastal cities, architecture, Culture, Development,

## Where are the Women? Gender, Traditional Ecological Knowledge, and Food Sovereignty in Native American Communities

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*New Mexico State University*



### **Abstract**

This paper analyses the interconnections between gender and traditional ecological knowledge in Native communities in the United States and highlights the significance of Native women's contributions to biocultural diversity conservation and food sovereignty in their communities. Drawing on ethnohistorical archival research from the works of anthropologists in the early 1900s, and more recent documentation of women's expertise in traditional ecological knowledge in online media such as podcasts and seminars, this study focuses on the permaculture practices in Native communities such as the Hidatsa, Navajo, Ojibwe, Coahuilla, and Haudenosaunee. Utilising post-colonial indigenous feminist theory and critical theory, the paper analyses data through discourse and narrative analysis, discussing Native women's knowledges pertaining to gardening, gathering, foraging, as well as extensive culinary, spiritual, and medicinal knowledge of plants that are passed down through the matrilineal kin. Furthermore, the paper highlights the relationship between food sovereignty and activist/resistance work as it relates to Native women, their identities, and their sacred roles in their cultures. The study sheds light on the shift in conversations on Native food sovereignty from Eurocentric academic spaces to spaces of decolonial resistance created by Native women to revive their ancestral connections with the land and their foodways, and the role of language in the gendering of traditional ecological knowledge in these communities. This paper is a contribution to Native perspectives on resource conservation and food sovereignty, and adds to the literature on environmental anthropology,

## Sub-theme 6: Language, History and Culture

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ecofeminism, and traditional ecological knowledge of Native communities.

**Keywords:** *traditional ecological knowledge (TEK), environmental anthropology, Native women, food sovereign*

## Representation of Female Body by Feminist artists of Bangladesh (1990s)

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### **Abstract**

Despite the considerable advancements Bangladeshi women have achieved since the nation's inception in 1971, the struggle for gender parity remains ongoing due to entrenched societal norms that reinforce limiting gender roles, coupled with inadequate enforcement of legislations designed to safeguard women's rights. The 1990s witnessed a proliferation of feminist artists such as Rokeya Sultana, Dilara Begum Jolly, Atia Islam Anne, Nazlee Laila Mansoor, and Tayeba Begum Libi, who courageously confronted the oppressive constructs of patriarchy and its established role for women throughout history. This research endeavors to delve into how Bangladeshi feminist artists of the 1990s harnessed the female body as a form of resistance against patriarchal norms. A prevalent stereotype has taken shape wherein women are frequently depicted in passive and subservient roles, perpetually objectified to cater to male desires. This study contends that feminist artists shattered these stereotypical representations of the female body, thus shaping feminist discourse. Employing qualitative interviews and drawing on literature encompassing gender politics, artistic nudity, notions of femininity, the gaze, voyeurism, feminist theory, eroticism, and sexuality in art, the analysis aims to scrutinize the portrayal of the female body. While art critics have offered subjective insights into the portrayal of the female body in contemporary Bangladeshi art, a dearth of critical literature exists in terms of analytical discourse on this subject. This paper fills this gap by contributing to the existing corpus of Bangladeshi art literature, thereby paving the way for further scholarly investigations.

*Keywords: femininity, objectification, empowerment, representation, cultural norms*



















## **Sinhala Social Culture and Dance Education System**

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*University of the Visual and Performing Arts*

### **Abstract**

Education is the transmission of culture. Culture is the wealth of spiritual and intellectual resources that man has achieved and created throughout his history. Accordingly, in historical and cultural contexts, dance education is built based on the view of life in which both the spiritual and intellectual aspects of man are developed at the same time. That education system has succeeded in creating a society made up of people with a balanced personality. It can be found in the information investigation that the pioneering mission of creating a Sinhala society with an excellent culture has been done through the education system based on the temple, *Pirivena* and *Guru Gedera*. Here the traditional dance education process is important. It is built based on the house. It has produced not only a traditional dancer but also a person who can contribute to humanitarian social progress. In the education process of the *Guru Gedara*, the teacher was known as *Gurunnanse*, and he has been able to play an important role in the process of social integration. Accordingly, the primary purpose of this research is to investigate the traditional *Guru Gedara* dance education process. What is the nature of the influence of the traditional dance education process in the building of Sinhala social culture? What are the positive features contained in it that can be used for the academic dance education process? In relation to the problems that arose, data was collected through qualitative research methods, analyzed, and interpreted, and conclusions were reached. Accordingly, this descriptive research will be important to identify the nature of the traditional teacher's home education process and its peculiarities and to identify the direction of modern dance education. It will help to build a good society.

*Key Words: Gurunnanse, Guru Gedara, well-balanced personality, social progress, social cohesion*

## Language Choice of Maldivian Bilingual Youth: In the Home Domain

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### **Abstract**

Declining of the use of native language, Dhivehi among the Maldivian bilingual youth has been observed as a huge concern. Some people seem to believe that, if necessary, steps are not taken soon, this decline of the native language of the Maldives might lead to the extinction of the language in the long run. Hence the main objective of this study is to identify the language choice of Maldivian Bilingual youth in the Home Domain. This quantitative study utilised an adapted survey questionnaire to obtain the data, from 400 Maldivian bilingual youth. Data was analysed quantitatively by using descriptive statistics. The findings indicate that, to communicate in the home domain, especially with the parents, more Dhivehi is used compared to English or Dhinglish. This floats some hopes for the revitalization of the Native language. However, as English and Dhinglish seem dominating in many other domains, it is an alarm for us to take the issue into consideration in a more serious manner.

*Key Words: Language Choice, Home Domain, Maldivian Bilingual Youth*





*Sub-theme 7*  
Law, Justice, defence and security  
Religion  
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## **Eloquence of the apostrophe technique in the Holy Quran**

*Ali Ahmed Omran*

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### **Abstract**

This study traces the phenomenon of apostrophe in the Holy Quran, which is one of the most frequent phenomena in the Inimitability of the Quran and the most widespread in the Quran. It has made those interested in the Holy Quran interested in studying it, analyzing it, and exploring its images. This study of the concept of apostrophe focused on Surat Al-Imran. It achieved its meaning, its intended meaning (its term), and monitored its images, and explored the aspects of the beauty of the rhetorical, and functional functions, and followed the views of several studies in many of these images and discussed their views. This research came in a preface, two examinations, and a conclusion. The preface served as an introductory to the study around the concept of apostrophe, and its most important linguistic, rhetorical, and literary features. As for the first topic: it was a theoretical study that examined the language, terminology, and the eloquence of the concept of apostrophe and its creative secrets. As for the second topic: the research focused on the applied part of the concept. Thus, the study analyzed the places where apostrophe occurred in the Holy Qur'an in Surat Al-Imran. The research found a set of results, developed at the end of the research.

*Keywords: apostrophe, Inimitability, rhetoric, images, language.*



## Child Custody: The Need for Better Legal Framework in Maldives

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*The Maldives National University*



### **Abstract**

In the Maldives, when a divorce or other custody dispute arises, the mother is often given primary custody of the child from the beginning, with the father typically only having access to the children on a restricted schedule or, at best, on alternating weekends. Section 40 of the Law No: 4/2000 (Family Act) emphasizes in favour of sole custody of the child and affirms custody of child shall be decided in the best interest of the child. However, there is no provision in the Family Act 2000 that dictates the amount of time allocated to fathers to spend with their children; nor does it provide any definition of the best interest of the child. This study aims to focus on exploring ways both parents can play an active role and have equal access to children. Thus, the author explored legislations, and judicial decisions of different countries to find equitable solution for the problem. Most of these legislations on child custody emphasize that the welfare of the child shall be the highest consideration. A brief explanation and application of shared parenting in Australia is detailed to show the importance of this concept. This research enlightens that the shared custody focuses on the child rather than the parents' own conflicts and rights. It further illustrates in the absence of clear law and proper guidelines the courts of the Maldives have obstacles in deciding cases and implementing such decisions. In addition, this research highlights that the shared custody concept does not contradict Islamic law and emphasizes the importance of having codified legal rules related to shared parenting and detailed procedural rules to ensure the child's welfare.

*Keywords: Child welfare; custody; family law; Islamic law; parental access*

## **Emerging Cyber Identity Theft Offences: Legal Analysis of the Applicability of Penal Law of the Maldives**

**Fathimath Waheeda**

*The Maldives National University*



### **Abstract**

Identity theft is not a new phenomenon. However, the modus operandi of the crime has changed with technology, internet, and the increased use of social media networks. This has created many challenges in the investigation and prosecution of cybercriminals committing this offence. The objective of this research is two-fold: (1) to identify the new emerging cyber-identity offences and (2) to recognize the applicability of the present provisions to the range of conduct which falls within the ambit of the crime.

The methodology adopted a qualitative approach through purposive sampling, which consisted of seven semi-structured interviews with criminal investigators, prosecutors, lawyers, and judges. The data gathered was examined and analyzed to extract the results.

The results show that (1) identity theft offences are ever evolving and with new scams, where the method differs, that leave the victims without redress, and (2) that there are several offences which are applicable, under the law, but there are challenges that prevent the successful investigation and prosecution of the crime. Overall, it is possible to address the identity theft offence under the present provisions of the criminal law. It is recommended to strengthen both the substantive and procedural laws governing the effective prosecution of cyber-identity theft.

***Key words: Identity theft, cyber fraud, cybercrime***

## **Implementation of Islamic Law in the Present Era in Maldives: Reality and Hope**

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*The Maldives National University*



### **Abstract**

The Islamic Shariah with its sources, texts and discreet rules has never been idly handed or tied to the feet in front of the changing reality of life since the era of the Companions and after them until Western colonialism came, which replaced it with its man-made legislation. This research aims to give a brief definition of the Maldives as it also deals with the concept of Islamic law, its importance, and its advantages over other legislations. The research sheds light on the implementation of Islamic law in the present era in the Maldives and studying it in the light of reality and hope. The research adopts the inductive and analytical approach to extrapolate what was mentioned in the Holy Qur'an, the noble Prophet's Sunnah, the sayings of scholars from the predecessors and the successors, and then analyzing them in a way that suits the present era. The research concludes that Islamic law is a divine system and it is valid for every time and place so that no one -whoever he is- can dispense with it or replace it with another system, and the implementation of Islamic law in the present era in the Maldives needs to take into account matters related to the state and its dependence on other countries with regard to financial and other assistance, as well as signing in international treaties and documents - like other countries - with regard to man-made laws. The research recommends that there should be a close study that deal with such sensitive topics in our present time so that people do not think bad of Islam, and that they do not rush to demand the implementation of Islamic law in the Maldives until after completing all its causes and reasons.

***Keywords: Implementation, Islamic Law, Maldives, Reality, Hope***

## Evaluating the requirement for statutory reform in regulating compensation for medical negligence within the jurisdiction of the Maldives

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The Maldives National University, Ministry of Health<sup>2</sup>*

### Abstract



The Maldives Health Care System has faced a number of medical negligence cases, of which only a handful have made it to trial and successfully claimed for compensation. An applicable statute exclusively compensating medical negligence in the Maldives is still being debated. The research

question of the study is whether there is a requirement to endorse legislative reform to effectively regulate compensation for medical negligence within the jurisdiction of the Maldives and what necessary amendments or additions are to be made to the current legislation governing compensation for medical negligence to make it more efficient. This document analysis research has been conducted by analyzing different documents retrieved from different databases. The MvLaw web page was searched for the duration of one week, retrieving statutes relating to medical negligence. The Maldives Civil Court website was searched for the duration of one week, retrieving key cases of medical negligence and compensation. Lexis-Nexis was searched for three weeks to collect articles relating to compensation for medical negligence. The Islamic Sharia perspective was searched within Quran, Hadith, textbooks and scholarly articles. The findings show that the legislative provisions governing compensation for medical negligence in the Maldives are inadequate and do not sufficiently address the remedies in a comprehensive manner. Further, this research reflects that Islamic Sharia has a flexible mode that bears resemblance to the no-fault system offered by Common Law. Hence, it is suggested that in the Maldives, no-fault compensation model is suitable as it also bears resemblance to Islamic Sharia principles. A statutory reform is required as the existing provisions governing compensation for medical negligence in the Maldives are inadequate, and a suggestive reform would be a no-fault compensatory model as it also bears resemblance to Islamic Sharia principles.

## Peaceful Coexistence Between Different Ethnicities in the Light of Contemporary Political Interpretation of the Qur'an: Malaysian Society as a Model

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*University of Malaya*



### **Abstract**

The research dealt with peaceful coexistence in the reality of Malaysia, which represents a basic rule in dealing and living with coexistence between eighty-three ethnicities with different languages as it has established in the Holy Qur'an: "O Mankind! we created you from a male and a female, and we made you races and tribes, so that you may come to know one another". As all the human beings were in the beginning one family, the State of Malaysia took this theory and applied it. It highlighted one of the meanings of peaceful coexistence dealt with by the interpretation of the shades of the Qur'an, as it is practically alive and practiced in the state of Malaysia in all its aspects: security, psychological, societal, and political peace. This concept also includes religious tolerance and freedom of belief in Malaysia. The state of Malaysia is also unique among Islamic countries by giving full rights to non-Muslim citizens, equality, and justice among the people of the country without slightest discrimination of religion, gender, or language. The state of Malaysia is spreading justice and eliminating all kinds of racism and fulfills its duty to the fullest in protecting lives from diseases, by providing free treatment to all citizens, Muslims, Hindus, Buddhists, and Christians, and protecting property. It is a basic principle that cannot be manipulated or compromised in the reality of Malaysian life, government, and people.

*Keywords: Peaceful coexistence, ethnicities, Contemporary, interpretation, Malaysian society*

## **Methodology of Imaam Muhammad bin Jareer al-Tabari in his Exegesis: Surat Saba' as a Model**

*Mohamed Mursaleen Mohamed Ismail, Shausan Waseem, Aishath Sheila, Khadeeja Hidaaya, Zimna Adam, Zaha Zakariyya*

*The Maldives National University*



### **Abstract**

Exalted scholars have served the Holy Qur'an with their many interpretations, and they have adopted a variety of different approaches in their interpretations. The interpretation of Imam al-Tabari was one of the most prominent and best of what was written in the traditional interpretation in the third century AH, as he had a special approach that he followed from the beginning of Surat Al-Fatihah to Surat Al-Nas in his exegesis which was named "Jami' al-Bayan fi Ta'wil Ayat al-Qur'an." This research aims to explain the concept of methodology in general and the methodology of the exegetes. The research also deals with the exegesis of Imam al-Tabari and the features of his valuable interpretation. The research deals with the methodology of Imam al-Tabari to know his methodology in his exegesis in general. The research also sheds light on Surat Saba' in its entirety and analyzing it on the methodology of Imam al-Tabari as a model study. The research relies on the inductive and analytical approach to extrapolate what Imam al-Tabari wrote in his exegesis and then analyzing it. The research concludes that Imam al-Tabari had a special methodology in his exegesis, and he relied in his interpretation of this noble surah on interpretation of Ma'thoor (Tradition) and opinion, as well as citing different types of qira'ath, poetry, and language and syntax. The research recommends that there be convergent studies in our university - The Maldives National University - to study the methodology of exegetes in the service of heritage books so that students can benefit in the field of interpretation of the Qur'an.

*Keywords: Methodology, Imam Muhammad bin Jareer, Exegesis, Surat Saba', al-Tabari,*

## Law Schools as Hubs of Justice: Exploring their Contribution in Enhancing Access to Justice through Legal Aid

**Batool Z Qazi**

*The Maldives National University*



### **Abstract**

Legal aid is an integral element of access to justice. A recent report on Political Process Monitoring study on Access to Justice in Maldives, highlighted that the progress in realizing the objectives of access to justice through legal aid services is insufficient. Further, non-enactment of a legal aid bill in Maldives has further accentuated the inadequacy of the legal aid, thus impeding access to justice. Hence the study seeks to explore and identify the unexplored synergy that can be built between the existing key agencies and law schools in bridging the gap through legal aid to enhance access to justice. The study adopted a qualitative approach using semi structured interviews with three lawyers providing pro bono legal aid and two NGO's providing legal aid and other key agencies including the Office of the Attorney General of Maldives, Bar Council of the Maldives, and academicians from two law schools in the Maldives. The interviews were transcribed, coded, and analyzed. The results revealed that at present the law schools are quite peripheral and do not appear to be actively engaged in providing legal aid. Furthermore, with the developments of the Bar council in establishing a pro bono clearing house, law schools can make a potential impact on the delivery of legal aid in Maldives. This would require active collaboration with the law schools and the key agencies. This can be achieved by promoting clinical legal education and developing the requisite skills among the law graduates.

*Key words: Access to Justice, Legal Aid, Maldives, Law Schools.*

## **Reviewing the Implementation of Religious Affairs Regulation and Policy Regarding Female Circumcision in Malaysia and Its Implications**

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University of Malaya*

### **Abstract**

In 2009, the Fatwa Committee of the National Council for Islamic Religious Affairs in Malaysia (MKI) declared female circumcision as a mandatory Islamic practice, provided it does not cause harm. However, this practice has drawn criticism, likening it to Female Genital Mutilation (FGM) in Africa. The United Nations Human Rights Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) recommended in 2018 that Malaysia cease the practice, contending that it is merely a cultural tradition without religious obligation and questioning the authority of the hadith used to justify it. This qualitative study aims to identify the multifaceted aspects and implications resulting from the implementation of religious affairs regulation and policy regarding female circumcision in Malaysia. Through content analysis, this study explores the underlying reasons behind the ongoing polemics surrounding the practice. Disagreements persist among various stakeholders, with some considering it a local custom rather than a religious requirement. Contemporary scholars engage in debates concerning the authenticity of relevant hadith sources, further complicating the matter. Additionally, concerns arise from the varying methods employed and the need for better understanding and implementation among medical practitioners. The absence of authoritative guidelines from regulatory authorities in Malaysia contributes to the complexity of the issue. In conclusion, the findings of this study underscore the urgency of resolving the polemics surrounding female circumcision in Malaysia. There is a clear need for comprehensive research to develop guidelines that prioritize the safety and adherence to Shariah principles. By addressing these concerns, this study can ensure that future policies and practices regarding female circumcision in Malaysia are well-informed, ethically sound, and respectful of both religious and human rights considerations.

*Keywords: Female circumcision, Religious Affairs in Malaysia, Implementation, Religious Practice, Female Genital Mutilation*



## **The Reality and Challenges of Authoritative Regulation and Policy on Hadith Publication in Malaysia and Indonesia**

*Mohamad Khalid Bahrudin, Ishak Suliaman, Mohamad Azrien*

*Mohamed Adnan*

*University of Malaya*

### **Abstract**

Dissemination of inauthentic hadith in publications, ill-intent understanding of hadith text and its exploitations for personal or group interests are some of the contemporary issues faced by Malaysia and Indonesia. This article focuses on the reality and challenges of authoritative regulation and policy on hadith publication in both countries to tackle such issues. This phenomenological study uses interviews, observations, and document analysis as data collection methods. This study discovered that regulation mechanism is implemented in Malaysia in the form of guidelines issued by federal authorities. These guidelines, however, are not backed up by stern and clear enforcement by the government. At the state level, there are enactments gazetted but they are too broad in their interpretation and more to the context of maintaining hadith chastity from contemptuous acts. On the other hand, Indonesia at the federal level, does not have any specific and systematic methods to regulate the text of hadith and now, only depends on available general mechanisms especially the one applied in higher education institutions. The study concludes, to preserve hadith corpus from a faulty utilization and abusive application, both governments should pay more attention in introducing new laws as well as policies in strengthening the existing mechanism related to hadith text in this archipelago.

*Key words: authoritative, policy, regulation, enforcement, hadith, Malaysia, Indonesia.*

*Sub-theme 8*  
*Governance and Politics*  
*Gender and Human Rights*  
*Social*  
*Population and Demography*

6



## **Progress, Issues and Challenges of Ocean Governance: Policy Directions for Ocean Governance in the Maldives**

*Aly Shameem, Aishath Hassan, Asim Abdul Sattar, and Mohamed Sofwan Ahmed Adil*

*The Maldives National University*



### **Abstract**

Ocean governance is a crucial area of research and capacity building for the Maldives being an ocean state comprising 99 percent of its territory water and driving 60 percent of country's gross domestic product (GDP) from it. The Maldives lacks technical knowhow and expertise for engaging in multilateral politics and international regimes in protecting and advancing its national interests as a huge ocean state. This research paper aims to explore the status of ocean governance and subsequently recommend the policy directions and strategies that can be formulated and enforced to sustainably govern ocean or maritime affairs in the Maldives. This is done by reviewing primary and secondary documents that relate to ocean governance and maritime affairs in the Maldives. The outcomes of the progress and challenges of ocean governance in the Maldives that were presented at the symposium are reviewed and analysed. By drawing on the outcomes of the Ocean Governance Conference, focus group discussions were held with eight stakeholders to determine policy directions for ocean governance in the Maldives. The findings highlight the need to develop a legal framework for ocean governance and determine the strategies and the management of maritime affairs in the Maldives. The findings provide insights into the progress, issues, and challenges of ocean governance in the Maldives. It will provide: (1) a deeper understanding and recognition of the importance of ocean governance in the Maldives; (2) evidence for policy makers to provide an enabling environment for addressing ocean governance issues in the Maldives; (3) identify gaps in policy and invest in capacity building for ocean governance; and (4) serve as the basis for future priority actions on ocean governance, in particular on such aspects as maritime affairs, biodiversity, and climate change.

*Keywords: sustainability, ocean governance, stakeholder engagement*

## **Mapping The Structure of Actors and Constraints in Realizing Sustainable Settlement Development**

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Machfud Machfud*

*IPB University*

### **Abstract**

Settlement development is a complex process and involves various actors. Under these conditions, settlement development ends with the phenomenon of urban sprawl. Therefore, it is necessary to map the constraints of settlement development and the actors involved, to realize sustainable settlement development. The purpose of this research is to map the structure of actors and constraints in settlement development. The method used to map the actors as well as settlement development problems is interpretive structural model (ISM). The results show that the main obstacles in settlement development are at the spatial planning policy level, stakeholder coordination, and enforcement of spatial planning regulations. Key actors who have a major role in realizing sustainable settlement development can be divided into two, namely the level of regulators and the main actors of development. At the regulatory level, there are main actors, namely the Land and Spatial Planning Service; Department of Public Works, Housing and Energy and Mineral Resources; Regional Development Planning Agency; Provincial government; and District/City Governments. Meanwhile, the main actors at the program level and practical activities for settlement development are the Housing Council, Perum Perumnas Regional V Yogyakarta, developers, and the community. Thus, an effective planning process can be carried out by mobilizing the key actors and addressing the main issues.

*Keyword: ISM, land use plan, policy, regulation, settlement*

## **The cultural context of maritime trafficking from Bangladesh: The case of Dolphin Visa narrative of Rohingya women and children**

*Ahmed Abid<sup>1</sup>, Abdur Razzaque Khan<sup>2</sup>*

*<sup>1</sup>University of Liberal Arts, <sup>2</sup>University of Dhaka*

### **Abstract**

This article centres on the trafficking and maritime journeys of Rohingya women and children, drawing insights from interviews conducted with survivors of the Andaman crisis and a cohort of young Rohingya students in Chittagong. The primary focus lies on illuminating the role of cultural marriage practices as a critical factor rendering these individuals susceptible to cross-coastal trafficking from Bangladesh. This study posits that cultural norms surrounding marriage play a pivotal role in rendering Rohingya women and children vulnerable to cross-coastal trafficking. In the absence of viable alternatives, some girls opt to marry Rohingya males residing abroad, facilitated through telephonic communication, particularly among individuals based in Malaysia and Indonesia. Following these marriages, the young brides, women, and girls are expected to reunite with their spouses or family members, with the male partners bearing the expenses of smuggling operations. Given recent measures taken by the Bangladeshi government and immigration authorities to curtail the issuance of fake passports or travel documents to Rohingya females, the hazardous and perilous sea route remains their sole option to reach their partners or family members residing overseas. This study employs an ethnographic approach involving in-depth interviews and observational data collection during the aftermath of the Andaman crisis, concentrating on the trafficking-prone regions of Ukhiya and Cox's Bazar, including the vicinity of the old and new Rohingya camps as well as Chittagong city. The findings underscore the continuation of significant irregular trafficking of Rohingya women and girls along the Cox's Bazar coastal area, extending even to their recently established remote settlement, Bhasan Char, during the ongoing COVID-19 pandemic.

*Keywords: Rohingya crisis, Human trafficking, Data analysis , Trafficking-prone regions, COVID-19 pandemic*

## **Fertility Trends and Ideal Number of Children in Asia**

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*UAE University*

### **Abstract**

Over the last 40 years, there is a Global trend in fertility decline, including in the Asian region. Value shifts lead to the dominance of gender-egalitarian attitudes that are linked with lower fertility. This research tackles the puzzle of the relationship between perceptions of gender roles in society and the ideal number of children. Empirical survey data collected from Emirati, Nepali, and Maldivian youths revealed that a big share of youths supports the traditional perspective on marriage and think motherhood is the most important thing for women. For example, on average Emirati youth ideally wish to have in their future families 4-5 children, and sons are preferable to daughters. Youths who favor the economic independence of women and equal participation in household work contribution by spouses desire a lower number of children which is in line with the modernization theory and cultural evolution theory. The study provides a comparative perspective on current youth attitudes and fertility intentions.

*Keywords: future families, fertility, children*

## **Parent-Child Attachment and Romantic Relationship: Is There a Relationship Between Parent-Child Attachment and Young Adults' Romantic Relationships?**

*Aishath Shanoora, Hanina Halimatusaadiah, Haslinda binti Abdullah, and Azlina Mohd Khir*



### **Abstract**

Parent-child relationship quality is most often measured by attachment securities or insecurities during infancy and childhood. Many researchers have found that the key to the future adaptations or maladaptation's of children is the attachment they form with their parents. Early research on attachment has highlighted the impact of parent-child attachment continuing throughout life. Recent research has shown that insecure attachment during childhood impacts young adults' attachment with their parents and, in turn, impacts different aspects of their lives. However, limited studies have explored the direct relationship between attachment styles and young adults' romantic relationships among Maldivian young adults. This study aimed to assess the relationship between young adults parent-child attachment and the quality of romantic relationships among young adults in higher education institutions in the Maldives. A cross-sectional survey was conducted among 463 students aged 18 to 28 in higher education institutions in the Maldives. The data were collected using the Perceived Relationship Quality Scale and the Attachment to Parent/Carer Inventory. The results showed high levels of avoidant attachment with both mother and father among the participants, which was negatively associated with their current romantic relationship quality. In addition, it also showed an association between mother-child anxious attachment, father-child anxious attachment, and the romantic relationship quality of young adults. Hence, a direct connection between insecure attachment styles (avoidant attachment and anxious attachment) and low levels of relationship quality was established.

*Keywords: parent-child attachment, romantic relationship, Maldives, PLS-SEM, young adult*

## **Employer attitudes in hiring disabled people in the Maldives.**

*Mariyam Ashfa Hamdi*

*Villijoali*



### **Abstract**

This research project aimed to find employer attitudes towards hiring disabled people in the Maldives. Six employers from different industries in the private and public sectors were recruited for semi-structured interviews. Though all employers explicitly showed a positive outlook, close observation revealed that they harboured a mixed, ambivalent attitude towards it, reliant on certain factors stemming from the hegemonic ableism in Maldivian society and work culture. Stigma attached to disability in the community and issues from co-workers were perceived by employers as the main challenges, whereas the benefits of having disabled employees were only discussed in a broader community sense. Several recommendations were made, including crafting policies to enable accessibility and accommodation in all stages of recruitment and employment and starting a nation-wide awareness programme on disability employment, which incorporates how ableism can exclude disabled people from the workforce.

*Keywords: Co-workers, Employers, Challenges, Disabled Employees, Accessibility*



*Sub-theme 9*  
*Tourism, Economics and Finance,*  
*Entrepreneurship and, Management*

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## **Creative economy policies and practices in the Maldives tourism industry**

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*The Maldives National University,*

### **Abstract**

This study examines the relationship between tourism and the creative economy in the Maldives in the context of SIDS. The purpose of this research is to analyze the relationship between Maldives' (a Small Island Developing State) tourism and creative economy. It emphasizes how important it is to move away from relying so much on tourism and instead construct a creative economy to modernize and diversify the economy. This study explores whether such a change poses a threat to ongoing advancements within a political economy or presents a novel possibility for equitable and sustainable growth. By adopting a qualitative approach, data were collected through a total of 15 semi-structured interviews with government officials, tourism entrepreneurs, and skilled employees interacting with the tourism sector. It used purposive sampling to ensure that maximum data was gathered to be able to identify the opportunities and challenges. Furthermore, it allowed us to collect data on the various policies and strategies that were adopted by the government and tourism entrepreneurs for the effective formation, growth, and development of the creative economy within the tourism sector. The findings of this study highlighted many important facets such as that investments and technological advancements spearheaded by the private sector play a crucial role in linking the tourism and creative economy. At the same time, it also identified challenges and opportunities involving the development of human capital, innovation, organizational and institutional modernization, and the creative activity of all market participants within the operation of an evolving political economy.

*Keywords: tourism, Small Island Developing States, creative economy, economic diversification, entrepreneurship.*

## **The Challenges to Human Resource Management during Covid -19 Pandemic: Perspective of the Resort Operators of Maldives.**

**Zeenath Solih**

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### **Abstract**

The COVID-19 pandemic impacted the economic and social life of many nations in unprecedented ways. The hospitality and tourism industry worldwide with no exception faced numerous challenges. The human resource leaders and managers across the globe responded to this crisis at different levels. As of today, there is no research done on this aspect of the calamity in a small island nation like the Maldives. Thus, the aim of this research is to evaluate on a case study basis the human resource (HR) challenges that the Resort Operators in the Maldives had to manage during this crisis. The objectives of this research are to determine the workforce management challenges and the implication on human resource planning and disaster management, including an analysis of the strategic and operational level challenges of human resource managers during the pandemic. This research utilised qualitative research paradigm of two phases of data collection, stage one included focus group discussion of the employee perspectives, while stage two was semi- structured interviews of human resource managers of resort operations. The findings demonstrate the operational challenges such as staff burnouts, impacts on mental wellbeing, staff readiness and capacity to adapt to technological application for existing teams. Issues of man-power management, gaps of workforce re-design and other transformational initiatives that were applied by the human resource leaders were also analysed highlighting the importance of adaptability and responsiveness to the nature of the arising issues. These findings contribute towards the empirical research on how HR managers of resort operations respond to unprecedented challenges and the importance of developing a sustainable functional HR model that can tackle such a crisis in similar contexts.

**Key words:** *Human resource management, human resource challenges, COVID-19 pandemic, Resort Operators.*

## **Workforce localisation in the resort sector of the Maldives**

*Ismail Shiyar<sup>1</sup>, Hashma Adnan<sup>1</sup>, Hussain Naseer<sup>1</sup>, Aishath Shirumeen<sup>1</sup>, Zeenath Solih<sup>1</sup>, Aminath Afrah Mukhtar<sup>1</sup>, Mohamed Shafy Rasheed<sup>2</sup>*

*<sup>1</sup>The Maldives National University, <sup>2</sup>Villa College*

### **Abstract**

The inception of the tourism industry in Maldives in 1972 has played a vital role in contributing to the small island nation's development, particularly in economic growth, societal values, culture enrichment, environmental sustainability, and political regulations. The Ministry of Tourism of Maldives describes the tourism industry as one with the country's most significant number of employees. Currently, 20,794 expatriates and 15,093 locals work in the hospitality and tourism industry, totaling 35,887 workers. The Employment Act specifies that an employer is conditioned to prefer locals over expatriates and does not account for employment discrimination. Given the current labor market situation, the need to localise employment opportunities as much as possible within this sector is one area where action is needed. Identifying these opportunities can help to develop policies and strategic action plans toward formulating a localised human resource capital development policy. The study aims to evaluate the current challenges concerned with workforce localisation in the resort sector of the Maldives. As the current challenges in this area need a Maldivian context, this research adopts an exploratory case study approach. The target population is the managers and human resource managers of resorts in the Maldives. The sample population was selected using non-probability purposive sampling. Data was collected using semi-structured, open-ended interviews until data saturation. The interviews were transcribed and the codes and themes were generated using content analysis. The overarching themes indicate the need for national level strategies, collective effort from the industry, the regulatory authorities and educational institutions. The study suggests that groundwork is needed to develop local human capital regarding skills and passion for the service industry, the backbone of the Maldivian economy.

***Keywords:*** *tourism; workforce localisation; human capital; service industry; employment.*

## Diagnosing Halal Tourism in Maldives from a Systems Perspective

*Khairul Akmaliah A Adham<sup>1</sup>, Ahmed Munawar<sup>2</sup>, Mariyam Shihama<sup>2</sup>*

*<sup>1</sup>Universiti Sains Islam Malaysia, <sup>2</sup>Islamic University of Maldives*

### Abstract

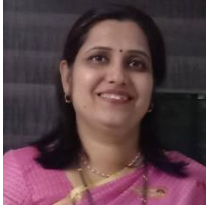
Maldives, whose entire population of half a million is Muslim, is aiming to diversify its tourism industry to further tap into the halal tourism market. In the last five years, tourism has accounted directly for over 27% of Maldives' GDP, making it the country's most important economic sector. Maldives currently ranks 19th among the leading 20 destinations for Muslim travellers. In competing with larger, more established global halal tourism players, the current state of this industry in the country must be understood. Therefore, the purpose of the study was to diagnose the current situation of halal tourism in Maldives from a systems perspective. In conducting this diagnosis, the authors utilised a framework based on the halal value chain concept and a systems framework, the Viable System Model (VSM). A qualitative research methodology was adopted, with data collected through in-depth interviews with policymakers, industry players and travellers. The findings show that Maldives has two distinctive tourism environments: private resorts and local islands. The private resorts can customize their services to meet the needs of the Muslim travellers. Interestingly, the environment of the latter has substantial readiness to serve the lucrative global halal tourism market. The practice of Islam on these islands means that Muslim travellers encounter a conducive environment of availability of halal foods and mosques, and existence of Islamic values. These aspects naturally address the basic concerns and needs of Muslim travellers. The fact that all Maldivian citizens are Muslims, spark the interest and trigger the actual decisions of Muslims to travel to the country. Nevertheless, the country requires a specific policy for the halal tourism industry, as well as the development of specific units that directly support the country's aspiration to diversify its tourism industry's offerings.

*Keywords: Viable System Model, VSM, systems perspective, systemic approach, halal tourism, tourism, Maldives*

## **Image processing application in hospitality industry**

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### **Abstract**

The objective of the study was to explore the application of image processing in the hospitality industry. A critical review was done using the keywords, 'image processing, Algorithm, hospitality, security, and services. The results showed that image processing is a technique of manipulating and analyzing digital images using different algorithms depending upon the type of operation to be carried out on the image. The various steps in image processing includes acquiring of image from source, storing the image in a database, retrieving the image from storage structure, enhancing the quality of image by using mathematical models, analyzing the image by using various algorithm and using statistical tools and the last step is the interpretation of image to extract valuable information from it or improve their visual quality. Image processing has one of its important applications in the hospitality industry. Image processing has several applications in the hospitality industry such as contributing to improved customer experiences, operational efficiency, and security. Here are two ways image processing can be utilized in the hospitality industry. Facial Recognition for Check-In/Check-Out, Surveillance and Security, and automated parking system. The application of image processing techniques in the hospitality industry continues to evolve, offering different opportunities for improved guest experiences, operational efficiency, and security.

*Keywords - Image processing, Algorithm, hospitality, security, services*

## **Attributes of Muslim-Friendly Airport Services: A Literature Review**

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*Universiti Sains Islam Malaysia*

### **Abstract**

Air travel is the main mode of transport for both international and domestic travelers. Travelers spend long hours in airports and onboard airplanes where passenger movement is relatively restricted due to the nature of the civil aviation industry. Research shows that it adds value to Muslim travelers when they are provided with halal food and other services that facilitate Muslim travelers to observe their religious duties during their travel journey. Muslim passengers' encounters inside the airports are not always friendly, and many feel anxious about their interactions with others in airports when they travel to certain countries. The objective of this study is to review extant studies on Muslim-Friendly airport (MFA) services and identify attributes of Muslim-Friendly airport services. In conducting this study, a search was conducted on relevant English language articles published between 2016 and 2022 and electronic databases including Google Scholar, Springer Link and ScienceDirect were accessed and papers that contain terms "Muslim-Friendly airport", "Muslim-Friendly tourism" "Muslim-Friendly airlines" and "Muslim travel" in the abstract or keywords were retrieved. Muslim-friendly airport/airline model remains an untapped business model, and researchers have begun to analyze this business concept and bring literature into surface only recently. Muslim-Friendly tourism, particularly the Muslim-Friendly airport/airline service, is arguably the most institutionalized segment of the tourism industry. Integrating halal tourism industry into aviation industry bring about a highly institutionalized environment. In a nutshell, this research will ultimately make a substantial contribution to the corpus of knowledge. This research will offer a significant contribution to the literature and assist future researchers by bring about relevant literature on Muslim-Friendly tourism and MFA services and identifying MFA service attributes.

*Keywords: Muslim-friendly airport, Muslim-friendly tourism,  
Muslim-friendly airlines, Muslim travel*

## **Impact of Covid 19 crisis on Maldives tourism, SMEs, Women Business and Education**

**Hinna Khalid**

*Kazu Institute*



### **Abstract**

In Maldives, COVID-19 impacts felt as early as February 2020, where our tourism sector was the first industry to absorb the economic shock from the crisis. A Rapid Gender Assessment reports that 26% of women informal workers reported losing their jobs and 54% of such women (versus 40% of men) cited reduced income. COVID-19 has directly impacted over 91,000 school children from pre-KG to higher secondary in 315 schools. In this research three approaches were used to gather information for the research carried out to see the COVID-19 crisis on Maldives tourism, SMEs, and Women. After literature review, semi-structured interviews were carried out with individuals following a focus group discussion. Results show that COVID-19 impacted the tourism, SMEs women business, education, and even human rights. However, there is limitation in the scope of this research, which could have covered the higher education institutions in the Maldives.

***Keywords: COVID-19; tourism; Gender; SMEs; informal workers***



## The Saving Pattern of Maldivian Millennials and its Cognitive and Psychosocial Determinants

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Universiti of Malaya



### Abstract

Millennials are projected to occupy 75% of the global workforce by 2025. The millennials' current saving behavior is recognized as critical for retirement planning and their future economic well-being. In the Maldives, 40% of the population consists of millennials who dominate the workforce. Thus, research on millennial saving behavior is important as the nation faces challenges in the provision of free health care, welfare, and old age benefits due to its national debt at 103% of its GDP. This study's objective was to explore the pattern and determinants of the Maldivian millennials' saving behavior. Conceptually, it is placed within psychological economics with demographic, cognitive, and psychosocial determinants of saving behavior. The study's methodology was quantitative, using a Likert-scale survey questionnaire. A representative sample of 432 working millennials from 20 private and 20 public sector organizations participated in the study. Saving behavior was measured using monthly average savings (MAS) as the dependent variable. Age, gender, income, marital status, number of children, and regional affiliation were used as independent demographic variables. Education level and financial literacy were the independent cognitive variables. The psychosocial determinants included self-control, risk tolerance, future-time perspective, and upbringing. The data analysis used descriptive statistics and the results of multiple regression. The findings revealed that 20% of millennials had trouble saving money each month, with women saving less than men. MAS was positively related to income and marital status while being negatively related to age and the number of children. The psychological determinants that had a positive and notable impact on MAS were future-time perspective and risk tolerance. Recommendations are made for further research and for policymakers based on the insightful findings on millennials' savings habits and their determinants.

*Keywords: Saving; millennials; cognitive and psychosocial determinants; income; psychological economics.*

## **Transformational leadership and job performance of Maldives Civil Service employees, mediated by organisational commitment.**

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*<sup>1</sup>The Maldives National University, <sup>2</sup>Management and Science University*



### **Abstract**

Emerging research on public administration theory has highlighted the need for public sector managers to become better leaders by inspiring and motivating them to align themselves with their organisation's mission and vision. Therefore, transformational leadership has become increasingly appealing in public administration. This study investigates how transformational leadership affects the job performance of those in the Maldives' civil service. Furthermore, it tests the mediation effect of organisational commitment on the relationship between transformational leadership and the job performance of those working in the Maldives' civil service. This study adopted a quantitative and cross-sectional design to collect data from 370 employees from different Maldives civil service offices. Data was collected through an online questionnaire, and structural equation modelling was used to test the hypotheses. The mediating effect was tested using bootstrapping. The results reveal that transformational leadership did not significantly affect job performance. While a mediation effect was present, the effect size was within a small range. The result of this study has important implications for the Maldives' civil service from a human resource management perspective and provides insights to policymakers on how to improve leadership in Maldives' civil service institutions. Furthermore, this study contributes significantly to the existing research in understanding the effect of transformational leadership on public sector organisations in Asia and from a developing country's perspective.

*Keywords: Transformational leadership; Task performance; Adaptive performance; Commitment Paper type Research paper*

## Female entrepreneurs' entrepreneurial experiences in the Maldives: From concept to implementation and beyond

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*Islamic University of Maldives*



### **Abstract**

The number of women-owned SMEs in the Maldives has increased because of the recent popularity of e-commerce and the COVID-19 pandemic, which has resulted in more women entering the world of entrepreneurship. Thus, the purpose of this study is to describe the entrepreneurial experiences of female entrepreneurs in the Maldives to gain an understanding of the various stages of entrepreneurial development. This study employed a qualitative methodology, with semi-structured interviews conducted with five established female entrepreneurs in the Maldives. Purposive sampling technique was used to select participants who could provide the most information rich data. The data collected through interviews was analyzed using thematic analysis method. The study's findings revealed that the entrepreneurial idea was primarily inspired by the passion and hobby of the entrepreneur, which was initially financed by using the bootstrapping method. In addition, family/friend relationships and social media platforms have been identified as useful to business. Similarly, most female entrepreneurs preferred image growth over financial growth when it came to expansion and growth. However, there was a lack of competence on business planning and resource generation. Hence, they proposed that government officials implement financial literacy, upskilling programs, and equal opportunities for growth for female entrepreneurs. The findings of the research have important implications for drafting effective policies and guidelines that will promote female entrepreneurship in Maldives. Moreover, it would help in the development and implementation of programs to assist female entrepreneurs in the development and sustenance of their business, as this research will help the policy makers to gain insight into the entrepreneurial experiences of female entrepreneurs in depth.

**Keywords:** *female entrepreneurs, entrepreneurial experiences, SMEs*

