ZEP RESEARCH
"Pioneering Innovation, Shaping the Future"

LINCOLN UNIVERSITY COLLEGE

WFCCES

Proceedings of the

World Forum on Climate Change and Environmental Sustainability

"Exploring innovative solutions, research, and strategies to combat climate change and promote sustainability"

22nd - 23rd, May , 2025 | Kuala Lumpur, Malaysia



ISBN:
978-81-983609-3-9

WFCCES – 25

World Forum on Climate Change and Environmental Sustainability

Kuala Lumpur, Malaysia

22nd - 23rd May

Organized by
ZEP Research

https://www.zepresearch.com/

Publisher: ZEP Research

©Copyright 2025, ZEP Research – World Forum on Climate Change and Environmental Sustainability at Kuala Lumpur, Malaysia on 22nd - 23rd May, 2025

No part of this book can be reproduced in any form or by any means without prior written Permission of the publisher.

Acknowledgement

ZEP Research is hosting the World Forum on Climate Change and Environmental Sustainability **WFCCES-25** at **Kuala Lumpur, Malaysia,** on **22nd - 23rd, May, 2025.**

The main objective is to offer an exceptional opportunity to engage with the latest global developments in climate change, environmental policies, sustainability strategies, and green technology. This forum encourages professionals and researchers to discuss shared environmental challenges, explore innovative solutions, and foster professional growth in this critical field.

There will be a wide scope for continuous networking opportunities and thought-provoking sessions. These sessions will serve as an excellent opportunity to absorb knowledge from globally respected experts. Engaging with peers and sharing sustainability case studies and institutional successes will help attendees build strong professional relationships and establish their voices as environmental thought leaders.

I express my heartfelt gratitude to all my colleagues, staff, reviewers, professors, and members of the organizing committee for their dedicated efforts in making this forum a success. I also extend my sincere thanks to all our international delegates who have traveled from afar to be part of this important event.

Let us come together to shape a more sustainable future through knowledge, innovation, and collaboration.

Priyanka Sahu

Mrs. Priyanka Sahu
Director,
Zep Research

Editorial

Dear Readers,

In an era defined by escalating climate concerns and the urgent need for sustainable development, the World Forum on Climate Change & Environmental Sustainability (WFCCES): Shaping Tomorrow's Sustainable Landscape serves as a vital platform for intellectual exchange and collaborative discourse. This gathering of esteemed scholars, researchers, environmental advocates, industry leaders, and policymakers underscores the collective commitment to addressing climate challenges through innovation, policy reform, and forward-thinking strategies.

As the world grapples with rising global temperatures, biodiversity loss, extreme weather events, and the complexities of transitioning to a low-carbon economy, this forum aims to explore cutting-edge research, emerging technologies, and sustainable practices that can drive impactful change. It provides an opportunity to discuss actionable strategies that align economic progress with environmental responsibility, ensuring a future that is both resilient and ecologically sound.

Through insightful keynote addresses, rigorous academic presentations, and dynamic panel discussions, this event aspires to generate meaningful conversations that bridge disciplines and sectors. The knowledge and innovations shared here will undoubtedly contribute to shaping global environmental policies, guiding industries, and inspiring communities toward a more sustainable and climate-resilient future.

We welcome all participants to engage in this vital dialogue, collaborate on transformative ideas, and take an active role in shaping the future of our planet. Let us work together to build a world where environmental sustainability is not just an aspiration but a reality for generations to come.

Warm regards

,

Prof. Dr. Midhun Chakkaravarthy
Dean of the Faculty of AI Computing and Multimedia
Lincoln University College, Malaysia

Preface

ZEP Research is hosting the **World Forum on Climate Change and Environmental Sustainability (WFCCES-25)** Conference at Holiday Inn Express, Kuala Lumpur City Centre, an IHG Hotel, Kuala Lumpur, Malaysia on, 22nd - 23rd May 2025. This edition of conference is called in Malaysia. Hosted onsite and online mode for the convenience of our attendees.

It is our pleasure to have **Dr. Abdulwahed Jalal Nori, Dr. Shahnaz, Dr. Dinesh, Dr. Divya, Prof. Dr. Midhun Chakkaravarthy** as our Session Chair and the Keynote Speakers are **Prof. Dr. Amiya Bhaumik**, **Sr Ts. Dr. Zulkiflee Abdul-Samad**, **Dr. Ibrahim Adam Ahmed Shogar**, **Prof. (Dr) Nidhi Agarwal, Prof. Ts. Dr. Nangkula Utaberta**, **NG YOON SEONG, Prof. (Dr) Ipseeta Nanda, Ludwig O. Federigan, EMDRCM, CBP**.

The **World Forum on Climate Change and Environmental Sustainability (WFCCES)** is dedicated to fostering collaborative efforts in addressing the pressing environmental challenges of our time. The upcoming 2025 edition serves as a pivotal platform for discussing the practical implementation of advanced knowledge across various domains, including climate science, policy, renewable energy, sustainable development, and environmental technologies.

This forum is an essential gathering for researchers, practitioners, policymakers, and industry leaders to exchange ideas, share insights, and forge collaborations. Through keynote presentations, technical sessions, panel discussions, and interactive workshops, we aim to explore the latest developments, innovative solutions, and ethical considerations in this rapidly evolving field.

We are honored to host distinguished experts and enthusiasts from around the globe, each contributing unique perspectives and expertise.

We extend our heartfelt gratitude to all participants, sponsors, and organizers whose dedication has made this event possible. Let us embark on this journey of discovery, innovation, and collaboration.

Welcome to WFCCES 2025 – Shaping A Sustainable Future Through Knowledge and Action.

World Forum on Climate Change and Environmental Sustainability

Kuala Lumpur, Malaysia

22nd - 23rd May

Organizer's Message



Mrs. Priyanka Sahu
Director,
ZEP Research, India

Dear All,

It is with great pleasure that we present the proceedings of the **World Forum on Climate Change and Environmental Sustainability (WFCCES-2025)**. This compilation of scholarly work represents the collective efforts of researchers, academicians, environmental practitioners, and industry leaders dedicated to advancing sustainable development and addressing the urgent challenges of climate change.

WFCCES-2025 serves as a global platform for interdisciplinary dialogue, innovative research dissemination, and meaningful collaborations across domains such as environmental science, sustainable policy, renewable energy, and ecological technology. The papers included in this volume reflect a wide spectrum of pioneering studies, novel methodologies, and practical approaches to solving today's most pressing environmental issues.

We extend our heartfelt appreciation to all authors, reviewers, keynote speakers, and delegates for their vital contributions. Special thanks to our host institution and the dedicated organizing committee, technical team, and advisory board, whose efforts have been instrumental in bringing this event to life.

We hope the insights shared through this proceedings book will inspire further research, encourage impactful collaborations, and drive sustainable innovations worldwide. We look forward to the continued growth of this vital platform in future editions of **WFCCES**.



Mrs. Priyanka Sahu
Director,
ZEP Research, India

Keynote Speakers



Steve Willis
Founder
Herculean Climate Solutions, Malaysia

Dear All,

It is a pleasure to join the WFCCES conference in KL. As an industrially hardened chemical engineer and climate fiction author, I bring nearly 40 years of environmental and innovation experience across a wide range of fields.

I co-founded Herculean Climate Solutions to identify the multi-million tonne solutions that are required to address the climate crisis. Some of these solutions have become startups, others are being worked on by companies and the boldest have become the central themes of 'Fairhaven – A Novel of Climate Optimism'.

My Keynote '**The Role of Climate Fiction in Addressing Climate Change - Can A Good Story help us See a Better Future?**'

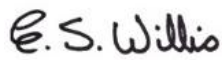
Explores the need for positive-outcome, solution-focused, action-based narratives about the climate crisis to encourage engagement and overcome the widespread feeling of apathy or worse.

Fairhaven describes currently fictional solutions that are based on real world projects, including massive Ocean Restoration approaches, large-scale Arctic ice management, cloud brightening and coastal adaptation. The stories show relatable people dealing with their climate anxiety alongside the enormous scale of the projects that they are working on.

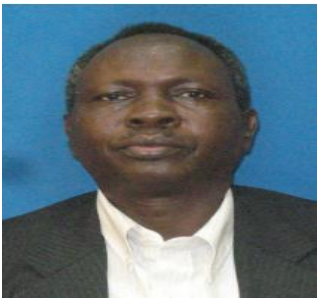
Fiction is an extraordinarily powerful visualisation tool which allows people working in the field and the wider public to imagine where we are going, what the future might look like and what it would take to get there.

I look forward to hearing the presentations of the delegates, hearing their thoughts on how the future will unfold, and what can be done about it.

Best regards,



Steve Willis
Keynote Speaker
WFCCES-2025



Dr. Ibrahim Adam Ahmed Shogar
Associate Professor
International Islamic University
Malaysia

Dear All,

The **"*World Forum on Climate Change and Environmental Sustainability* (WFCCES)",** organized by ZEP Research is coming in a critical time. The current ecological crisis is a matter of urgent global concern that seeks global solutions and sincere cooperation of nations and all parties of the human community: experts, policymakers, organizations and publics. The relevant solution sought to be associated with a precise identification and clear vision of root causes which, consequently, guide to the development of valid theories that capable to address the issue from its various dimensions. The distinguished scholars of various disciplines across the globe have been suggesting solutions of different kinds to current ecological problem. They agree that the major part of environmental crisis comes from human actions. However, more significantly, scholars are in agreement that human actions are determined by his ideas and beliefs. This factor obviously identifies the strategic approach to deal with our ecological crisis; that is to rebuild our ideas and beliefs towards nature. It is very fortunate that ZEP Research, a global platform is dedicating to bring together scientists, environment activists, innovators, and scholars to address the urgent matter of environmental challenges facing our world today. It is much appreciated the outcome of the WFCCES should find the way for practical application.

Best regards,



Assoc. Prof. Dr. Ibrahim Shogar
Keynote Speaker,
WFCCES-2025



Prof. (Dr) Nidhi Agarwal
Professor Faculty of Social Science and Humanities
Lincoln University College, Malaysia

Dear All,

I am truly honored to be invited as a keynote speaker for WFCCES-25. I extend my heartfelt gratitude to the organizing committee for this remarkable opportunity to share my insights at such a prestigious global platform.
Today, we gather at a critical juncture—one defined by unprecedented environmental challenges and the urgent call for sustainable solutions. As we witness the impacts of climate change, resource depletion, and ecological disruption, the role of education has never been more pivotal. Education is not merely a pathway to knowledge; it is the foundation upon which we build values, shape behaviors, and inspire action.

But what if education itself could become a catalyst for sustainability? What if our classrooms could nurture a generation that not only understands the science of climate change but is also equipped with the skills and values to combat it? This is the essence of the "Green Curriculum"—an educational framework that goes beyond textbooks and exams, embedding sustainability into the very fabric of learning.

The Green Curriculum is not just an add-on; it is a transformative approach that reimagines education at every level, from early childhood to higher education. It teaches environmental literacy, fosters ecological ethics, and encourages sustainable practices. It empowers learners to become active stewards of the planet, not passive recipients of knowledge. Consider a

classroom where students not only learn about climate change but also practice sustainable agriculture, design green energy solutions, and engage in community projects that restore local ecosystems. Imagine universities where sustainability is not just a subject but a way of life—integrated into research, campus operations, and social responsibility initiatives. This is the vision of a truly green education.

But achieving this vision requires more than just curriculum changes. It demands a shift in our educational philosophy. Teachers must be trained as sustainability mentors, educational policies must prioritize green literacy, and collaboration between governments, educators, and communities must be strengthened. As I stand before this esteemed audience, I invite you all to reflect on the role of education in shaping a sustainable future. Let us work together to transform our educational systems into engines of ecological consciousness, empowering the next generation to build a greener, more resilient planet.

On behalf of the conference chair and the entire organizing team, I extend a warm welcome to all participants. I look forward to the insightful discussions, meaningful collaborations, and inspiring exchanges that await us at WFCCES-25.

Best regards,



Prof. (Dr) Nidhi Agarwal
Keynote Speaker,
WFCCES-2025



Sr Ts. Dr. Zulkiflee Abdul-Samad
Associate Professor of Project Management
Faculty of Built Environment
University of Malaya, Malaysia

Dear All,

Respected guests, esteemed delegates and fellow visionaries. I am honoured to welcome you to the 2025 World Forum on Climate Change and Environmental Sustainability (WFCCES) in Kuala Lumpur, Malaysia, where our shared mission is to drive bold climate action and sustainable innovation.

As an Associate Professor in Project Management at the Faculty of Built Environment, University of Malaya, I bring almost three decades of combined academic, research and industrial experience. I am excited to share insights on sustainable project management – an approach that integrates environmental stewardship, social responsibility, and long-term value into every phase of project planning and execution. From green infrastructure to low-carbon supply chains, sustainable project management empowers us to build with purpose and resilience.

Let's reimagine progress – not as a cost to the planet, but as a path to regeneration, equity, and enduring impact through sustainable project management practices. Welcome once again.

Best regards



Sr Ts. Dr. Zulkiflee Abdul-Samad
Keynote Speaker,
WFCCES-2025

Session Chair



Dr. AbdulWahed Jalal Nori
International Islamic University
Malaysia

Dear All,

It is a great honour to serve as one of the session chairs at the World Forum on Climate Change and Environmental Sustainability(WFCCES). As a lecturer at the International Islamic University Malaysia, I am deeply committed to advancing environmental awareness, collaborative research, and ethical responsibility in addressing the pressing challenges of climate change.

WFCCES stands as a vital global platform where diverse voices scientists, leaders, innovators, and changemakerscome together with a shared purpose: to safeguard our planet for future generations. Through meaningful dialogue, cutting edge research, and collective action, we can move beyond conversation toward real, lasting change.

May this forum continue to be a beacon of knowledge, hope, and inspiration for a more sustainable and just world.

Best regards

Dr. AbdulWahed Jalal Nori
Session Chair
WFCCES-2025

Organizing Committees

- **Dr. Ibrahim Adam Ahmed Shogar**
  Associate Professor
  Department of Computational and Theoretical Sciences, International Islamic University, Malaysia

- **Dr. Sipnarong Kanchanawongpaisan**
  Deputy Director
  The Institute of Multidisciplinary Postdoctoral Research and Franchise Program, Shinawatra University, Thailand

- **Houda CHIHI**
  Senior Researcher
  at Innovcom lab of Supcom, Tunisia

- **Minhaz Farid Ahmed**
  University Lecturer
  Institute for Environment and Development, Universiti Kebangsaan Malaysia, Malaysia

- **Prof. Dr. Midhun Chakkaravarthy**
  Dean of the Faculty of AI Computing and Multimedia
  Lincoln University College, Malaysia

- **Zhilwan Tahir Hama Faraj**
  Researcher
  International Islamic University Malaysia (IIUM), Malaysia

Index

Sl No	Title	Author Name	Page
1.	Challenges and Opportunities of Big Data in Commercial Banks in Libya	• Nourdeen Elbogdadi Elklabi • Divya Midhunchakkaravarthy • Vivekanandam Balasubraman	1
2.	Forest and Land Fire Study in Central Kalimantan, Indonesia: Analysis on Landscape and Governance Aspects	• Hendrik Segah • Saputra Adiwijaya • Yuliana • Osi Karina Saragih • Puput Iswandyah Raysharie • Ida Bagus Suryanatha • Ahmad Irawan • Muhamad Arief Rafsanjani • Okta Simon • Ma'mun Anshori • Didiek Surjanto	2
3.	Noming the Tides of Sustainability: Challenges and Opportunities in the Sustainable Seafood Industry	• Steven Nys • Ami Karmila	3
4.	Climate Change and Sustainable Development: Strategies for Resilience in Vulnerable Communities	• Iliasa Rashid Habib	4
5.	Climate Action and Environmental Sustainability: A Call for Urgent and Collective Action	• Ridhwan Salum Ali	5
6.	Effects of Climate Change on Biodiversity and the Importance of Biodiversity	• Kassim Mohamadi Omari	6
7.	Restoring Tanzania's Mangroves for Coastal Protection, Climate Resilience, and Biodiversity Conservation	• Massoud Khamis Kai	7
8.	Global Climate Change and Sustainability: Challenges, Innovations, and the Path Forward	• Khalef Moh'd Nassor	8

9.	The Role of Civil Society Organisations in Environmental Protection in Iraq	• Dr. Jamal Mohammed Ameen Hussein • Dr. Bafraw Rauf Hama Usf	9
10.	Urban Farming Practice Strategies of Barangay Commonwealth: A Qualitative Study	• Cherrylyn P. Esparagoza • Jerwin B. Vitales • Jaime P. Gutierrez Jr3	10
11.	Global Climate Change and Environmental Sustainability Challenges: Impacts of Green Energy Integration and Battery Electric Vehicles	• Associate Prof. Dr. Md Hasanuzzaman	12
12.	The Doll Metaphor in AI-Driven Education: A Deep Dive into Ethical Decision-Making in Personalization, Grading, and Learning Pathways	• Harsh Moralikrushna Panchal	13
13.	Urban Cropping Futures: AI-Enhanced Vertical Farming and Indigenous Wisdom in Solarpunk City Design	• Harsh Moralikrushna Panchal	14
14.	Decarbonization of Waste Banks and Household Inorganic Waste Collectors in Supporting a Healthy Environment	• R. Azizah • Sudarmaji • Edi Winarko • Rimuljo Hendradi • Juliana Jalaludin • Novi Dian Arfiani • Dwi Indahning Rohmah • Nabilatun Nisa • Mifaidah Kusumawati • Zaneta Aaqilah Salsabila • Zafira Nuha Naura	15
15.	Biodiversity in Teaching: The Filipino Ecology Using Foucaldian Discourse Analysis in Celine Murillo's Facebook Videos	• Irish L. Forteza • Angela Fernandez • Rosemarie R. Lumapag • Krizzane O. Serrano	17
16.	The Impact of Land Cover Change on Plants Diversity in Mount Argapura, East Java	• P. Wijayati Wulandari • Endah Sulistyawati • Endang Hernawan • Elham Sumarga	18

17.	Reducing Household Waste: A Community Effort Toward Zero Waste in Bangladesh	• Mst Sharmin Jahan • Dr. Sivasegaran Nadarajan	19
18.	Optimizing HVAC Systems for Improved Building Efficiency in KSA Across Varied Climates	• Mohammed A. M. Abdalla • Mohamed M El Fawa	20
19.	Essay eco-environment systems A study of education for enhancing quality of life with eco-systems	• Dr. Teerasak Jantaraked	21
20.	Innovation for changing the world	• Dr. Teerasak Jantaraked	22
21.	A Collaborative for Climate Change Adaptation by Poverty Alleviation Platform	• Kanokporn Chimplee • Pakpoom Buabthong • Rattikorn Srichaichana • Tipmol Traiyut	24
22.	Developing Sustainable Agriculture Policies: Implementing Climate-Smart Practices for Food Security in Klaten Regency	• Dewi Gunawati • Tri Tri Praptama • Dao Thu Hieu	25
23.	Harnessing Renewable Energy for Climate Change Mitigation and Sustainable Development in North Africa	• Ali Aboubakr Ali Khaboush	26

World Forum on Climate Change and Environmental Sustainability

ABSTRACTS

Challenges and Opportunities of Big Data in Commercial Banks in Libya

Nourdeen Elbogdadi Elklabi[1], Divya Midhunchakkaravarthy[2], Vivekanandam Balasubramaniam[3]

[1,2,3]*Lincoln University Malaysia, Faculty of AI computing and multimedia, Malaysia*

Abstract

The arrival of Big Data has transformed the bank industry globally, presenting unprecedented avenues for better decision-making, risk management, and customer interactions. The bank industry in Libya is challenged by different circumstances, such as political instability, limited infrastructure, and regulatory obstacles. This article synthesizes the challenges and opportunities for adopting Big Data in Libyan commercial banks. Relying on international experience and regional details, the review identifies major issues, such as data privacy, technological infrastructure, and a shortage of skilled human resources, and also underscores prospects, including better customers insights, fraud detection, and operational effectiveness. The article concludes by providing strategic suggestions for Libyan banks to utilize Big Data optimally despite existing challenges.

Keywords: *Big Data, Commercial Banks, Libya, Challenges, Opportunities, Financial Technology*

Forest and Land Fire Study in Central Kalimantan, Indonesia: Analysis on Landscape and Governance Aspects

Hendrik Segah[1], Saputra Adiwijaya[2], Yuliana[3], Osi Karina Saragih[4], Puput Iswandyah Raysharie[5], Ida Bagus Suryanatha[6], Ahmad Irawan[7], Muhamad Arief Rafsanjani[8], Okta Simon[9], Ma'mun Anshori[10], Didiek Surjanto[11]

[1,2,3,4,5,6,7,8]Center for Development of Science, Technology and Peatland Innovation (PPIIG) University of Palangka Raya, Central Kalimantan, Indonesia,
[9,10,11]World Wildlife Fund (WWF), Central Kalimantan, Indonesia

Abstract

This study analyzes the factors driving forest and land fires in Central Kalimantan, Indonesia, and aims to develop effective, sustainable management strategies. Central Kalimantan has experienced recurring massive fire events, notably in 2002, 2003, 2004, 2006, 2009, 2015, and 2019. The primary focus of stakeholder involvement has been on fire prevention and suppression. However, active community participation in prevention programs has been limited, often due to the top-down nature of program design and decision-making. This research highlights the need for strengthened budget priorities, particularly those aimed at the economic empowerment of women and the integration of their local knowledge related to handicrafts, natural resource management, and forest management. The study seeks to provide policy recommendations for the government and other stakeholders to enhance forest and land fire prevention and control efforts. A key finding is the necessity of shifting from top-down approaches to more inclusive, community-based strategies that recognize and utilize the knowledge and skills of local women, thereby fostering more sustainable and effective fire management practices.

Keywords: *Central Kalimantan, Forest and Land Fires, Governance, Stakeholder Engagement*

Noming the Tides of Sustainability: Challenges and Opportunities in the Sustainable Seafood Industry

Steven Nys[1], Ami Karmila[2]

[1,2]Global Environmental and Climate Conservation Initiative, Indonesia

Abstract

The seafood industry is a pillar of global food security and economic growth, feeding billions and employing millions globally. Nevertheless, mounting sustainability challenges climate change, overfishing, supply chain inefficiencies, and social inequities present extreme threats to the long-term sustainability of seafood production. Climate-related disturbances affect oceanic ecosystems, shifting the migratory patterns of fish and threatening aquaculture operations. Overfishing also destroys important stocks of fish, as degraded fisheries management and unreported, illegal, and unregulated (IUU) fishing are consuming resources. Supply chain complexity and labor rights-based ethical concerns add further momentum to the necessity of sector reform.

Despite such challenges, the seafood industry presents immense opportunities for sustainability oriented innovation. Advances in aquaculture technology, development of alternative seafood proteins, digital traceability systems, and consumer-driven market forces demanding sustainably produced seafood are revolutionizing the industry. The paper examines the major challenges facing the sustainable seafood industry, evaluates technological and policy-based solutions, and recommends strategic suggestions for ensuring resilience and sustainability in global seafood production.

***Keywords**: Aquaculture, Blue economy, Climate change, Fisheries management, Marine conservation, Overfishing, Policy regulation, Sustainable seafood*

Climate Change and Sustainable Development: Strategies for Resilience in Vulnerable Communities

Iliasa Rashid Habib
State University of Zanzibar, Tanzania

Abstract

Climate change poses significant challenges to sustainable development, particularly in vulnerable communities. Rising temperatures, extreme weather events, and shifting ecosystems threaten food security, water resources, and livelihoods. This paper explores the interplay between climate change and sustainable development, emphasizing strategies for adaptation and resilience-building. Using case studies from Tanzania, particularly Chake Chake and Zanzibar, it highlights community-led initiatives, policy interventions, and technological innovations that support sustainable development. The paper argues that integrating environmental conservation with socio-economic growth is essential for long-term sustainability. By fostering local participation, enhancing climate education, and leveraging green technologies, communities can build resilience against climate change while achieving sustainable development goals (SDGs).

Keywords: *Climate Change, Sustainable Development, Resilience Building, Adaptation Strategies, Vulnerable Communities, Food Security, Water Resources*

Climate Action and Environmental Sustainability: A Call for Urgent and Collective Action

Ridhwan Salum Ali
State University of Zanzibar, Tanzania

Abstract

As a degree student specializing in Geography and Environmental Studies, I am honored to address this conference prepared by the World Federation of Climate Change and Environmental Sustainability (WFCCES). Climate change is no longer a distant threat—it is a present crisis affecting every aspect of human life, from biodiversity to global economies. The need for urgent climate action and a sustainable approach to development has never been greater. My focus today is to emphasize the necessity of collective responsibility, technological innovation, and policy-driven strategies in achieving environmental sustainability.

Keywords: *Climate Change, Environmental Sustainability, Sustainable Development, Global Crisis, Climate Action, Biodiversity, Global Economies, Collective Responsibilit*

Effects of Climate Change on Biodiversity and the Importance of Biodiversity

Kassim Mohamadi Omari
State University of Zanzibar, Tanzania

Abstract

Biodiversity, the variety of life on Earth, plays a crucial role in maintaining balanced ecosystems and ensuring human survival. However, climate change is one of the greatest threats to biodiversity today. Rising temperatures, habitat destruction, and extreme weather events disrupt ecosystems and endanger many species. This document explores the effects of climate change on biodiversity and emphasizes the importance of preserving biodiversity for environmental stability and human well-being.

Keywords: *Biodiversity, Climate Change, Ecosystem Balance, Species Extinction, Habitat Destruction, Extreme Weather Events, Environmental Stability*

Restoring Tanzania's Mangroves for Coastal Protection, Climate Resilience, and Biodiversity Conservation

Massoud Khamis Kai
State University of Zanzibar, Tanzania

Abstract

The project titled 'Restoring Tanzania's Mangroves for Coastal Protection, Climate Resilience, and Biodiversity Conservation' will be specifically implemented in Zanzibar, where mangrove ecosystems are crucial for coastal protection, biodiversity, and climate change adaptation. This initiative focuses on restoring Zanzibar's mangrove forests, with the aim to safeguard coastal communities, enhance biodiversity, and mitigate the impacts of climate change in the region. While the title references Tanzania, the project is designed specifically for Zanzibar's coastal areas, ensuring that the solutions are tailored to the local context.

Keywords: *Mangrove Restoration, Zanzibar, Coastal Protection, Climate Resilience, Biodiversity Conservation, Tanzania, Ecosystem Restoration*

Global Climate Change and Sustainability: Challenges, Innovations, and the Path Forward

Khalef Moh'd Nassor
The State University of Zanzibar (SUZA), Tanzania

Abstract

Global climate change is one of the most pressing challenges of the 21st century, threatening biodiversity, economic stability, and human well-being. As temperatures rise, extreme weather events become more frequent, and natural resources face depletion, urgent action is needed to ensure a sustainable future. This forum explores the interconnected relationship between climate change and sustainability, highlighting innovative solutions in renewable energy, carbon reduction, and sustainable development. Experts, policymakers, and industry leaders will discuss strategies for climate adaptation, green technologies, and global cooperation. The goal is to foster actionable insights that balance environmental conservation with economic and social progress, paving the way for a resilient and sustainable future.

Keywords: *Climate Change, Sustainability, Biodiversity Loss, Economic Stability, Human Well-being, Extreme Weather Events*

The Role of Civil Society Organisations in Environmental Protection in Iraq

Dr. Jamal Mohammed Ameen Hussein[1], Dr. Bafraw Rauf Hama Usf[2]
[1,2]University of Halabja, College of Law and Administration/Department of Law, Iraqi Kurdistan

Abstract

The issue of the environment and its protection is one of the topics that has preoccupied the international community. These risks are linked to technological advancements and human greed, which lead to the significant exploitation of natural resources without taking into account whether they are renewable or non-renewable. The emergence of various environmental problems, which pose a threat to human life in general, has imposed an urgent environmental revolution on governments and civil society institutions. Water shortages and air pollution have contaminated the environment in Iraq. Civil society organizations are trying to protect the environment, although they have faced many obstacles. In this regard, the role of civil society organisations has increased and become important in expanding the ecological debate to raise awareness of the dangers facing the environment in Iraq. This study uses a descriptive analysis to discuss the role of civil society organisations in environmental protection in Iraq. CSOs in Iraq are making great efforts in this area, but it is not enough given the increase in environmental problems and the spread of environmentally harmful behaviour among citizens.

Keywords*: role, civil society organisations, environmental protection, the importance of the environment, Iraq environment.*

Urban Farming Practice Strategies of Barangay Commonwealth: A Qualitative Study

Cherrylyn P. Esparagoza[1], Jerwin B. Vitales[2], Jaime P. Gutierrez Jr[3]
[1,2,3]*State University, PUP Quezon City Campus Philippines, Philippines*

Abstract

Rapid urbanization, compounded by the intensifying result of climate change, is rapidly reshaping the urban landscape and exacerbating food and environmental insecurities. This qualitative study investigates urban farming best practices in Barangay Commonwealth, a densely populated barangay in the Philippines, as a dynamic strategy for enhancing environmental sustainability and building climate resilience. Data were collected through in-depth interviews with community leaders, program facilitators and the officials in Barangay Commonwealth actively involved in implementing urban agriculture initiatives.

Findings reveal that constrained urban spaces have spurred innovative, sustainable agricultural practices such as container gardening, vertical farming, and rooftop vegetable gardens. These practices not only supplement local food supplies and reduce dependence on external markets but also contribute to mitigating urban heat island effects, improving air quality, and managing stormwater runoff (Maxwell and Smith, 1992). Participants highlighted that integrating green spaces via urban farming plays a key role in buffering the community against the adverse impacts of climate variability and extreme weather events, while simultaneously fostering a culture of environmental stewardship.

Importantly, the study underscores that urban farming has evolved into a viable economic opportunity. Community-based vendors are leveraging surplus produce from urban gardens to generate additional income, thereby strengthening local economies. Local support mechanisms— including community training sessions, resource-sharing networks, and modest institutional backing from the barangay—have further enabled these adaptive practices and economic initiatives (Chambers & Conway 1992). However, participants also emphasized the need for enhanced technical assistance, increased financial investment, and comprehensive policy frameworks to scale up sustainable urban farming practices and maximize both their climate adaptation and economic benefits.

This study contributes to the broader discourse on urban agriculture by illustrating its potential as a multi-benefit intervention for urban food security,

environmental restoration, climate change adaptation, and economic empowerment. Insights from the governance initiatives of Barangay Commonwealth suggest that urban farming initiatives can serve as a practical and sustainable policy solution for densely populated urban areas facing the dual challenges of environmental degradation and climate uncertainty.

Keywords*: urban farming, climate resilience, food security, environmental sustainability, community-based vendors, local economies and governance.*

Global Climate Change and Environmental Sustainability Challenges: Impacts of Green Energy Integration and Battery Electric Vehicles

Associate Prof. Dr. Md Hasanuzzaman
Higher Institution Centre of Excellence (HICoE) UM Power Energy Dedicated Advanced Centre (UMPEDAC), Kuala Lumpur, Malaysia

Abstract

Energy is one of the basic inputs for economic growth, automation, modernization and social development. Current global energy supply mainly come from fossil fuels that emits greenhouse gases. According to IPCC, global warming continues and getting worse if there is not rapid initiative will be taken to shift towards clean energy and decarbonization technologies. About 350 ppm of CO2 in the atmosphere is a safe norm. The current CO2 emission is already more than 400 ppm that is already crossed the safe level and represents a risk state. As the fossil fuels-based energy is the main source of CO2 emission and air pollution, the green energy and decarbonization technologies are the potential solutions. Transport sector is on the major emission producing sectors which is still now mainly depend on the fossil fuels. Battery electric vehicle is on of the potential solution to reduce the transport sector's emission. On the other hand, if the electricity is generated by clean energy sources and charged the BEV battery, emission will be reduced.

Keywords: *Energy Transition, Economic Growth, Fossil Fuels, Greenhouse Gas Emissions, Global Warming*

The Doll Metaphor in AI-Driven Education: A Deep Dive into Ethical Decision-Making in Personalization, Grading, and Learning Pathways

Harsh Moralikrushna Panchal
Renewable Energy and Environment, Igonu, India

Abstract

Artificial Intelligence (AI) is rapidly transforming educational systems by personalizing learning experiences, automating grading, and creating individualized learning pathways. However, the ethical use of AI remains a significant concern, particularly when it comes to issues of bias, transparency, and accountability in educational contexts. The metaphor of a doll—which represents an object shaped by human hands, and yet capable of mimicking independent action—offers a novel framework for understanding how AI in education can be both a tool and a reflection of human biases. This paper explores how the "doll" metaphor can be applied to AI in education, highlighting its implications for ethical AI design, decision-making in grading, and learning pathways. It examines how AI systems, like dolls, are shaped by their creators' biases and actions, potentially leading to consequences that may not align with ethical principles. By exploring the ethics of AI in education through this metaphor, this paper proposes strategies for ensuring transparency, accountability, and fairness in AI-driven educational systems.

Keywords: *Artificial Intelligence (AI), AI in Education, Personalized Learning, Automated Grading, Learning Pathways, Ethical AI, Algorithmic Bias, AI Transparency*

Urban Cropping Futures: AI-Enhanced Vertical Farming and Indigenous Wisdom in Solarpunk City Design

Harsh Moralikrushna Panchal
Renewable Energy and Environment, Igonu, India

Abstract

Urban cropping—reimagining food production within the built environment—offers a bold solution to climate challenges, food insecurity, and urban sustainability. This paper proposes an integrative framework combining AI-driven vertical farming, biomimicry, and indigenous agricultural knowledge within solarpunk-inspired urban ecosystems. We explore how these elements, when combined, support regenerative urban infrastructure that purifies air and water, promotes biodiversity, and strengthens local resilience. This interdisciplinary vision aligns with climate adaptation, urban development, and technological innovation strategies central to a sustainable future.

Keywords: *Urban Cropping, Vertical Farming, AI-Driven Agriculture, Biomimicry, Indigenous Agricultural Knowledge, Solarpunk Urbanism*

Decarbonization of Waste Banks and Household Inorganic Waste Collectors in Supporting a Healthy Environment

R. Azizah[1], Sudarmaji[2], Edi Winarko[3], Rimuljo Hendradi[4], Juliana Jalaludin[5], Novi Dian Arfiani[6], Dwi Indahning Rohmah[7], Nabilatun Nisa[8], Mifaidah Kusumawati[9], Zaneta Aaqilah Salsabila[10], Zafira Nuha Naura[11]

[1,2,3,4,5,6,7,8,9,10] Universitas Airlangga, Surabaya 60115, Indonesia

[5]University of Putra Malaysia, Serdang 43400, Malaysia,

[7]Universitas Gadjah Mada, Indonesia

[11]Non Government Organization (NGO) Enviro Earth Indonesia

Abstract

Background: Waste is a problem in many countries, especially Indonesia. Dealing with inorganic waste reduces environmental pollution and is also beneficial for health. The existence of waste banks and waste collectors is important in managing household inorganic waste to reduce greenhouse gases in the atmosphere.

Objective: To analyze the decarbonization of household inorganic waste collectors in supporting a healthy environment.

Methods: This research is a quantitative cross-sectional study design. Sample calculation using the Slovin technique. Descriptive analysis was used to calculate the lead of inorganic waste types regarding emission saving (decarbonization).

Results: The majority of inorganic waste management actors are women (98.7%), dominated by housewives (60.2%) with an average undergraduate education (51.2%) and an age above 40 years (83.3%). Conversion of the smallest emission value (kg CO2e/kg) is a 1 L mineral water plastic bottle with an emission value of 0.32 kg CO2e/kg, 1 L weighs 29 grams, 1000 grams (1 kg): 29 grams = 34.5 1 L bottles, One (1) kg of household waste has a carbon emission value of at least 0.32 kg CO2e x 34.5 1 L bottles = 11.04 kg CO2e. Respondents who collected weight of inorganic waste < 1 kg had higher results, with several respondents 62 people at 79.5%, while the total waste was 49.59 Kg of inorganic waste. in one day as a whole amounted to 538.64 kg CO2e/kg, every month 16,159.2 kg CO2e/kg and every year 193,910.4 kg CO2e/kg. Conclusion: Decarbonization can reduce carbon dioxide emissions (CO2) and greenhouse gas (GHG) emissions in the atmosphere contributed by sustainable pro-climate areas in supporting a healthy environment through waste management, so it can be improved by

forming new Waste Banks in other locations in Indonesia to support a healthy environment and reduce greenhouse gases in the atmosphere.

Keywords: *Decarbonization, Healthy Environment, Inorganic, Waste Bank, Waste Collector*

Biodiversity in Teaching: The Filipino Ecology Using Foucaldian Discourse Analysis in Celine Murillo's Facebook Videos

Irish L. Forteza[1], Angela Fernandez[2], Rosemarie R. Lumapag[3], Krizzane O. Serrano[4]

[1,2,3,4]Pamantasan ng Lungsod ng Valenzuela, Faculty of Education, Department of Filipino, Valenzuela City, Metro Manila, Philippines

Abstract

In the past few years, a growing number of environmentalists in the Philippines started to utilize the used of Filipino language by disseminating ecological knowledge and information, to make it more accessible and understandable to the general public. Social media sites, like Facebook, have developed into educational channels that promote the fusion of ecological literacy, technology, and Filipino. That's why the purpose of this study is to analyze the discursive strategies used by Celine Murillo in her Facebook videos in order to promote biodiversity in the country. The identified terminologies and discourses served as the foundation for the development of proposed integrative learning activities for Grade 7 Filipino curriculum. The analysis was guided by the five methods of Foucauldian Discourse Analysis as articulated by Kendall and Wickham (1999). The findings of the study led to the formulation of seven integrative activities aimed at reinforcing the use of Filipino in the dissemination of ecological knowledge, through the integration of Celine Murillo's Facebook content as a pedagogical resource in teaching biodiversity in the Filipino curriculum.

***Keywords**: biodiversity, creative minority, ecological knowledge, environmentalism, discourse*

The Impact of Land Cover Change on Plants Diversity in Mount Argapura, East Java

P. Wijayati Wulandari[1], Endah Sulistyawati[2], Endang Hernawan[3], Elham Sumarga[4]

[1,2,3,4]*School of Life Sciences and Technology,*
Bandung Institute of Technology (SITH-ITB), Indonesia

Abstract

Mount Argapura in East Java is one of the remaining plant diversity hotspots in Java. Mount Argapura is surrounded by densely populated villages and is the center of activity for the surrounding area. These anthropogenic activities change land cover so that it has an impact on changes in plant diversity. This study aims to analyze the impact of land cover change on plant diversity in the area. This study used spatial analysis method to identify land cover changes from 1998 to 2025 and conducted vegetation analysis to measure plant diversity in two land covers, namely primary forest and secondary forest that are most affected at the tree, pole, sapling, seedling, and understorey levels. Shannon-Wiener and Simpson diversity indices were used to quantify the level of diversity in the area. The results showed that at the tree level, the Shannon Wiener Index ((H')) was obtained: 3.0034, Simpson's Dominance Index ((D)): 0.0730 and Simpson's Diversity Index ((1-D)): = 0.9270. At the pole level, the Shannon-Wiener Index ((H')) was 2.3502, Simpson's Dominance Index ((D)): 0.1161, and Simpson's Diversity Index ((1-D)): 0.8839. At the sapling level, the Shannon-Wiener Index ((H')) was obtained: 2.5472, Simpson's Dominance Index ((D)): 0.1680, and Simpson's Diversity Index ((1-D)): = 0.8320. At the seedling level, the Shannon-Wiener Index ((H')): 2.3380, Simpson's Dominance Index ((D)): 0.1390, and Simpson's Diversity Index ((1-D)): = 0.8610. At the understorey level, the Shannon-Wiener Index ((H')): 1.3290, Simpson's Dominance Index ((D)): 0.4355, and Simpson's Diversity Index ((1-D)): = 0.5645. The results of this study are expected to provide a clear picture of the relationship between land cover change and the decline in plant diversity in primary and secondary forests. The implications of this study are important for formulating effective and sustainable conservation strategies in the Argapura Mountain area and other mountainous areas with similar land cover change dynamics.

Keywords*: land cover change, plant diversity, Mount Argapura*

Reducing Household Waste: A Community Effort Toward Zero Waste in Bangladesh

Mst Sharmin Jahan[1], Dr. Sivasegaran Nadarajan[2]
[1,2]*Lincoln University College, Malaysia*

Abstract

Household waste is one of the fastest-growing environmental problems in urban and rural areas of Bangladesh. Improper waste disposal leads to air and water pollution, clogged drainage systems, and health hazards. This paper highlights the importance of community-based efforts to reduce household waste and move toward a zero-waste lifestyle. It examines how local communities, especially in cities like Dhaka and Chittagong, are adopting small but impactful practices such as waste segregation at home, composting organic waste, and reducing single-use plastics. Real-life examples include neighborhood awareness campaigns, women-led recycling projects, and student volunteer groups collecting plastic waste for reuse. The paper also explores the role of local government and NGOs in training families about sorting waste, building compost pits, and setting up collection systems for recyclable materials. Special attention is given to low-income areas where innovative, low-cost solutions like using food waste as fertilizer and making eco-bricks from plastic have shown great results. Educational programs in schools and religious institutions are helping change habits and create a culture of responsibility. While challenges remain—such as lack of awareness, infrastructure, and policy enforcement—the success of these community-driven efforts shows that reducing household waste is possible when people work together. The paper concludes by recommending stronger public-private partnerships, better municipal support, and more awareness programs to scale up these sustainable practices across Bangladesh. With united community action, the goal of zero waste can become a reality.

Keywords: *Bangladesh, Household waste, Community action, Sustainability, Zero waste*

Optimizing HVAC Systems for Improved Building Efficiency in KSA Across Varied Climates

Mohammed A. M. Abdalla[1], Mohamed M El Fawal[2]
[1]Lincoln University College, Malaysia
[2]MTI University, Faculty of Engineering, Egypt

Abstract

The KSA experiences extreme temperatures, ranging from scorching heat in the desert regions to relatively cooler temperatures in the coastal areas. As a result, HVAC systems play a crucial role in maintaining thermal comfort and energy efficiency in buildings. The aim of the study is to investigate the current state of HVAC systems in KSA, identifies key challenges, and proposes strategies to optimize system performance for enhanced energy efficiency. The methodology includes data analysis, and simulations to evaluate the impacts of various optimization techniques. The results highlight the potential benefits of implementing energy-efficient HVAC technologies such as variable refrigerant flow systems, heat recovery ventilation, and building automation systems. The findings of the study can serve as a valuable resource for policymakers, building designers, and HVAC professionals to enhance building efficiency and reduce energy consumption in KSA.

Keywords*: HVAC systems, building efficiency, KSA, varied climates, optimization, energy efficiency, variable refrigerant flow, heat recovery ventilation, building automation systems*

Essay Eco-Environment Systems A Study of Education for Enhancing Quality of Life with Eco-Systems

Dr. Teerasak Jantaraked
Banbangsamrong School Anamai Rd Kanchanadit sub-district Muang district Suratthani Province Thailand

Abstract

Now that environmental issues are tremendous critical which is urgently needed for come up solution. Furthermore, A rubbish has triggered by the environmental consequences. It has affected on school and nearby. Because the school get affected with bad smell, it is spread over the unpleasant things. It is able to totally ruin the surroundings with destructive. Afterwards, it is impacted on sanitary and health conditions. The health conditions have been affected on teachers and pupils in school as well as community with evitable. The World Health Organization has not taken it for granted, it put forward the terms of disgusting rubbish is considered as waste household is not useful anymore. Owing to, get rid of, if anybody can be beneficial, it is not mentioned to the rubbish at all.

The problematic of trash is taken into account the national agenda. The trash is unwanted and it is a mandatory to eliminate abruptly; otherwise, it is getting worse and worse. We need to consider this issue regarding as sewage in school. That's why we can not steer clear of the sewage because it is inevitable, affected on green energy in the foreseeable future. Something is taken place without unexpected. It has occurred out of the blue. On behalf of Banbangsamrong School, we would like to express my concern this housing issues promptly.

Consequently, I would like to offer planting the tree for immersing the fresh air and an exceptional friendly-atmosphere in our school. Everyone has to take responsibility of eliminate the sewage. In additional, the plant the tree is able to get the fresh air and it is able to raise awareness of importance of eco-systems in the long term at all.

Finally, we are going to make a decision for harmonious with parents for setting up the project for eco-systems. We would like to ask for the budget for this proposal. Anyone kindly to provide the budget for us?

Keywords: *Environmental Issues, Waste Management, School Sanitation, Public Health, Rubbish Disposal, Air Pollution*

Innovation for Changing the World

Dr. Teerasak Jantaraked
Banbangsamrong school Anamai Rd Kanchanadit sub-district Muang district Suratthani Province Thailand

Abstract

Saving energy is an alternative and reduce electricity; moreover, a petrol is able to be the last long for next generations. The petrol is rare and has taken up for long for renewable because had it been multilayered with carcass for several years. Whereas generating electricity can be procure from wind energy; as well as coal and a petrol. The campaign which is relevant to switch off the light owing to save the energy in the entire Thailand. Consequently, I would like to invite everyone taking part in cut the electricity down as much as you can.

I have reckoned saving the energy can be miscellaneous methods, commencing with own home. I have found an instructor of mine raising awareness of the saving energy since I was young. Therefore, I have tried to come up with many ways for cut down an expenditure; especially, turning the unnecessary light off. For instance, I always turn off the light in the restroom if nobody is there. Additionally, nobody is in the kitchen, I switch off the light abruptly. Later on, my dad warns me, I do not have to switch off the light at all times because some light needs to be using; otherwise, it will be more cost energy, I obey him and I leave the light until I hit the bed. Moreover, I have followed up regulations from my dad because it is not a sophisticated instruction. I keep a promise and I abide by it. It has been touched on my heart until now.

Have you ever heard of the car pool campaign? I hope somebody used to hear before. This campaign offered me encourage of cut down the expenses, I am proud of the government had been proposed this campaign. It has an outstanding emphasized on the carpool and it is able to enable of unity at all.

Finally, although, an energy is unable to construct itself; nevertheless, we can apply existing the energy for eternal. Furthermore, the energy has not depleted, we can perform this task with your greatly effort. It has shown as ambitious, you are about to gain valuable, it is likely to advantage on the other. If you have discovered your performance is a superb, please let the other to accompany with you.

Keywords: *Energy Saving, Electricity Conservation, Renewable Energy, Wind Energy, Coal and Petrol, Energy Efficiency*

A Collaborative for Climate Change Adaptation by Poverty Alleviation Platform

Kanokporn Chimplee[1], Pakpoom Buabthong[2], Rattikorn Srichaichana[3], Tipmol Traiyut[4]

[1, 2,3]Nakhon Ratchasima Rajabhat University, Thailand

[4]Strategic Research Area Support System Development Project

Abstract

The impacts of climate change affect humans directly and indirectly, especially vulnerable groups or low-income people. The research project "Development and Upgrading of a Platform for Poverty Solving in Nakhon Ratchasima Province" is a collaboration between Area based University and network partners. Therefore, reducing vulnerability to climate change adaptation considering environmental factors and the context of the area. The goal is to create an integrated data system. mechanisms and operating models that can solve poverty problems comprehensively and accurately, while improving the quality of life of poor households in a concrete way. The workshop research focuses on the development of poverty alleviation platforms in 5 areas: (1) cooperation mechanism, (2) target and follow-up information system (PPPConnext), (3) referral and assistance system, (4) area-based poverty alleviation models, and (5) policy proposals to upgrade the foundation and promote social mobility, The research started from the analysis of the database of poor households. Analyze the problem with all sectors and apply information technology appropriately. Designing innovative solutions to poverty problems (Operation Model), such as increasing income by developing supplementary careers, raising product standards and supporting markets aims to encourage the poor to use their skills to improve their quality of life. The poor have a shield that prevents them from returning to the cycle of poverty and have immunity to adaptation. It leads to appropriate behavior modification to get out of poverty. However, the exit strategy came about after the poor became confident in solving the problem of poverty. They will have encouragement, pride and faith in their ability to address poverty that adapts and mitigates the effects of climate change. The performance not only increases the income of poor households but also creates social mechanisms and can solve poverty problems in a sustainable way.

Keywords*: Climate Change Adaptation, Collaborative, Poverty Alleviation Platform, PPPConnext*

Developing Sustainable Agriculture Policies: Implementing Climate-Smart Practices for Food Security in Klaten Regency

Dewi Gunawati[1], Tri Tri Praptama[2], Dao Thu Hieu[3]
[1,2,3]*Sebelas Maret University & Department of Agriculture and Food Security & Dalat University (Trung Dai Hoc Da Lat), Indonesia*

Abstract

The impacts of climate change, such as floods, tornadoes, and droughts, have affected several villages in Klaten Regency. Drought has led to decreased agricultural productivity, forcing farmers to reduce the area of land cultivated, which poses risks to local food security for rice and vegetables. Floods erode soil, reduce fertility, and increase the risk of erosion. Tornadoes destroy agricultural infrastructure, resulting in lower crop yields. Given these impacts, it is urgent to develop sustainable agricultural strategies that utilize climate-smart practices. Climate-Smart Agriculture (CSA) leverages existing agricultural knowledge and technology based on community involvement. The objective of this research is to examine sustainable agriculture policies and programs that implement sustainable agricultural practices and innovations to enhance agricultural sustainability and food production in response to climate change challenges. The research methodology includes a mixed methods approach, utilizing both qualitative and quantitative methods. Surveys are conducted to collect data from farmers regarding the agricultural practices applied, while in-depth interviews with stakeholders will explore perspectives and challenges faced. Data analysis will identify patterns and relationships between the implementation of climate-smart practices and agricultural outcomes, as well as their impacts on food security.Recommendations: Integrating research findings into policies to support the government in creating frameworks that encourage farmers to adopt innovative technologies, strengthen food security, and enhance the competitiveness of the agricultural sector as a whole. Additionally, the resulting recommendations can aid in the development of training programs and financial support for farmers, thereby creating a more resilient and sustainable agricultural ecosystem.

Keywords: *strategy, climate-smart practices, food security.*

Harnessing Renewable Energy for Climate Change Mitigation and Sustainable Development in North Africa

Ali Aboubakr Ali Khaboush
Lincoln University, Malaysia

Abstract

Given its enormous potential for renewable energy and its escalating environmental problems, North Africa is at a pivotal point in the global effort to combat climate change. This study explores how widespread solar and wind energy deployment in North Africa can contribute to international energy cooperation, regional sustainable development, and climate change mitigation. Assessing North Africa's capacity for renewable energy, analyzing the socioeconomic and environmental effects of renewable projects, and investigating the possibility of cross-continental energy interconnectors with Europe are the goals of the study. The methodology comprises case studies of ongoing interconnector projects, policy framework analysis, and a review of data from recent energy projects. With more than 8 GW of installed solar and wind capacity and more than 350 GW under development, North Africa is becoming a key player in the Mediterranean energy transition, according to key findings. A sizable amount of fossil fuel-based generation could be replaced by up to 24 GW of clean energy delivered to Europe via interconnectors. The results emphasize the need for strong governance and environmental protections while also highlighting the lower costs of renewable energy sources, improved access to electricity, and prospects for economic expansion. The study concludes that, when combined with inclusive policies, utilizing North Africa's renewable resources can have a significant positive impact on climate mitigation and sustainable development. and regional cooperation

Keywords: *North Africa, renewable energy transitions, climate justice, energy interconnectors, sustainable development*

Upcoming Conferences





ZEP Research
https://www.zepresearch.com/
info@zepresearch.com
INDIA

978-81-983609-3-9