



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid
INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES

Theme:
**Navigating The Future:
Anchoring Sustainability While Bridging
The Gap Between Economic Growth
And Marine Preservation**



**Conference Centre Faculty Of Law
University Of Nigeria, Enugu Campus**



**Wednesday 26 and Thursday 27
February, 2025**

Media Partner





INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
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Programme of Events

Conference Sessions

Book of Abstracts



INSTITUTE OF MARITIME STUDIES
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INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES



His excellency
BOLA AHMED TINUBU
PRESIDENT OF NIGERIA



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES**

KEYNOTE SPEAKER



His Excellency ,
ADEGBOYEGA ISIAKA OYETOLA, CON
HONOURABLE MINISTER OF MARINE AND BLUE ECONOMY



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
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SPECIAL GUEST OF HONOUR



His Excellency,
DIST. SENATOR (DR.) IBRAHIM SHEKARAU, CON, PEN.
THE SARDAUNAN KANO



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SPECIAL GUEST OF HONOUR



CHIEF DR. MRS FOLASHADE TINUBU -OJO
THE IYALOJA-GENERAL OF NIGERIA.



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UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES**

KEYNOTE SPEAKER



**THE DIRECTOR GENERAL/CHIEF EXECUTIVE OFFICER,
DR. DAYO MOBEREOLA**
NIGERIAN MARITIME ADMINISTRATION AND SAFETY AGENCY (NIMASA)



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

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**INTERNATIONAL CONFERENCE OF THE
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CHIEF HOST



PROFESSOR OGUEJIOFO UJAM
AG. VICE CHANCELLOR UNIVERSITY OF NIGERIA



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2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES**

LEAD PAPER PRESENTER



ENGR DR INNOCENT AKUVUE
THE PRESIDENT-GENERAL OF THE NATIONAL SHIPPERS
ASSOCIATION OF NIGERIA (NSAN)



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

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**INTERNATIONAL CONFERENCE OF THE
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LEAD PAPER PRESENTER



PROF NOUSHI RAHMAN

PROFESSOR OF MANAGEMENT

LUBIN SCHOOL OF BUSINESS, PACE UNIVERSITY, NEW YORK, USA



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES**

HOST / CONVENER



PROFESSOR FLORENCE O. ORABUEZE
DIRECTOR, INSTITUTE OF MARITIME STUDIES, UNEC)



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

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**INTERNATIONAL CONFERENCE OF THE
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DR. SOCHIMA EGOIGWE
CHAIRMAN LOCAL ORGANIZING COMMITTEE



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**INTERNATIONAL CONFERENCE OF THE
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MR FRED EMEKA ACHORU
SECRETARY LOCAL ORGANIZING COMMITTEE



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

INTERNATIONAL CONFERENCE OF THE INSTITUTE OF MARITIME STUDIES

**WELCOME ADDRESS BY PROF FLORENCE ORABUEZE, DIRECTOR INSTITUTE OF
MARITIME STUDIES AT THE OPENING CEREMONY OF THE 2ND HYBRID
INTERNATIONAL CONFERENCE OF THE INSTITUTE OF MARITIME STUDIES,
UNIVERSITY OF NIGERIA ENUGU CAMPUS**

Distinguished guests, esteemed speakers, participants, and colleagues, It is my great honour to welcome you to the 2nd Hybrid International Conference of the Institute of Maritime Studies at the University of Nigeria, Enugu Campus.

Today, we gather both in person and virtually to share our knowledge, expertise, and experiences on the critical issue of sustainably managing marine resources. Our conference theme, *"Navigating the Future – Anchoring Sustainability while Bridging the Gap Between Economic Growth and Marine Preservation,"* perfectly encapsulates our shared mission.

The rapid growth of the global economy has driven an increased demand for marine resources and maritime activities. Our oceans, seas, and coastal zones are vital for international trade, energy, food security, and biodiversity, yet they face unprecedented pressures from overexploitation, pollution, and climate change. We must reconcile economic development with the health and sustainability of our marine ecosystems. This conference serves as a dynamic platform for scholars, practitioners, policymakers, and stakeholders to engage in thoughtful dialogue and develop strategies that balance economic progress with marine conservation.

Over the next two days, we will delve into a range of topics including sustainable maritime practices, marine conservation, climate change mitigation, and innovative technologies for managing marine resources. I extend my heartfelt thanks to our keynote speakers, panelists, and paper presenters whose insights will greatly enrich our discussions.

I encourage all participants to actively engage in the sessions—ask questions, share your experiences, and contribute to this vibrant exchange of ideas. Your involvement is crucial to the success of our gathering. I would also like to thank our media partners, including Signature TV, and all our collaborators for their steadfast support in making this conference possible.

Once again, welcome to this important event. Let us work together to balance economic development with marine preservation and secure a resilient, sustainable future for our marine industry and our planet.

Thank you.

Prof Florence Orabueze

Director, Institute of Maritime Studies

University of Nigeria. Enugu Campus



INSTITUTE OF MARITIME STUDIES
UNIVERSITY OF NIGERIA, ENUGU CAMPUS

2nd Hybrid

**INTERNATIONAL CONFERENCE OF THE
INSTITUTE OF MARITIME STUDIES**

Theme:
**Navigating The Future:
Anchoring Sustainability While Bridging
The Gap Between Economic Growth
And Marine Preservation**

PROGRAMME OF EVENTS

Day 1: Wednesday, February 26, 2025

Time: 10 a.m-5 p.m

Venue: Conference Centre, Faculty Of Law University Of Nigeria, Enugu Campus, And Virtual Platform

10.00 am – Courtesy call on the Deputy Vice-Chancellor, UNEC

10.25am – Introduction of Dignitaries and Participants

10.35am – The National Anthem

10.40am – The UNN anthem

10.45am – Opening prayer

10.55am – Breaking of kola nuts

11:00 - Opening remarks by the Chairman of the ceremony

11.05am – Opening speech by the LOC Chairman

11.30am – Welcome address by the Host and Conference Convener, Prof. F. O. Orabueze, Director, IMS

12 noon – Opening Address and declaration of the Conference open by the Chief Host Prof. Oguejiofo Ujam, Ag. Vice-Chancellor, UNN

12.15pm – A brief citation on the Keynote Speaker 1, His Excellency, Adegboyega Oyetola, Hon. Minister of Marine and Blue Economy

12.25pm – The Keynote speech 1 by His Excellency Adegboyega Oyetola, Hon. Minister of Marine and Blue Economy

12.55pm – Music interlude

1.00pm – Brief citation on Keynote Speaker 2, Dr. Dayo Mobereola, Director-General/Chief Executive Officer, NIMASA

1.05pm – The Keynote speech 2 by Dr. Dayo Mobereola, Director-General/Chief Executive Officer, NIMASA

1.30pm - Goodwill messages (Special Guests of Honour, Guests of Honour, etc)

2.00pm – Music interlude

2.15pm - Lead Presenter 1 (Engr. Dr. Innocent Akuvue, President-General, National Shippers Association of Nigeria (NSAN))

2.45pm – Music interlude

2.50pm – Lead Presenter 2 (Prof. Noushi Rahman, Professor of Management, Lubin School of Business, Pace University, New York, USA)

3.20pm – Presentation of Fellowship Awards to Recipients

4.20pm – Vote of Thanks LOC Secretary

4.25pm – Refreshments

4.30pm – Prayer Closing and Group photographs

5pm – National Anthem and Departure



- 1.05pm – The Keynote speech 2 by Dr. Dayo Mobereola, Director-General/Chief Executive Officer, NIMASA
- 1.30pm - Goodwill messages (Special Guests of Honour, Guests of Honour, etc)
- 2.00pm – Music interlude
- 2.05pm - Lead Presenter 1 (Prof. Greg C. Nwakoby, Fmr. Vice-Chancellor, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State)
- 2.10pm – Music interlude
- 2.15pm - Lead Presenter 2 (Prof. Noushi Rahman, Professor of Management, Lubin School of Business, Pace University, New York, USA)
- 2.45pm – Music interlude
- 2.50pm – Lead Presenter 3 (Engr. Dr. Innocent Akuvue, President-General, National Shippers Association of Nigeria (NSAN))
- 3.20pm – Presentation of Fellowship Awards to Recipients
- 4.20pm – Vote of Thanks LOC Secretary
- 4.25pm – Refreshments
- 4.30pm – Closing and Group photographs
- 5pm – National Anthem and Departure

TECHNICAL SESSIONS

Panel 1: Integrating Ecotourism, Blue Economy Innovations, and Green Technologies for Sustainable Ocean Ecosystems

Panel Chair: Dr Paul Ezinna

Rapporteur: Mrs Linda Ajike

Time: 10am - 1pm

Join Zoom Meeting:



Ecotourism and Sustainable Ocean Economy, Maritime Education and Training, Blue Economy Innovations, Marine Engineering and Technology, Green Shipping initiatives, Environmental Science and Conservation		
S/N	Names of author (s)	Paper Titles
1	Joy Nneka Uchenye Ejikeme	Eco-Friendly Marine Recreation: A New Trend in Tourism and Hospitality Management in Nigeria
2	Obinna F. Emeafor & James O. Onyeabor, PhD	Sustaining Education in Nigeria through Maritime Archaeological Object-Based Learning in Museum
3	Udeagha John Ebuka, Okereke Godson Chiemena	Integrating GIS-Based Flood Modelling and Engineering Solutions for Sustainable Urban Planning for Coastal Cities in the Face of Climate Change
4	Kenneth Adonye Ibiama and Emelieze Michael Chukwuka	The Effect of Infrastructure on Maritime Tourism Development in Nigeria
5	Tobechukwu, F. Onah, Onyemaechi C. Ugwuibe, . & Paul C. Ezinna, .	Maritime Education and Training in Nigeria: Challenges and Prospects
6	Kenneth Adonye Ibiama and Smart Chimaeze Nwankwaola	The Impact of Socio-economic Characteristics on Maritime Tourism Development in Nigeria
7	Ikenna Amuka, Dr. Ugwoke Obioma Vivian, Dr. Nnamani Chidiebere, and Dr. Ozor Chidi David	Blue Economy: The Risk, Challenges and Prospects in Nigeria
8	Chigozie Jude Odum	Ecotourism exploration in maritime sector of Nigeria
9	Dr Jamila Shuaibu	Navigating the Legal Implications of Cargo Theft: The Role of AI in Maritime Security
10	Garba, Matthew Torkuma and Martin O. Agbili	Enhancing Maritime and Inland Waterway Disaster Resilience: The Role of AI and Predictive analytics in Risk Mitigation and Emergency Preparedness
11	Udeh Ambrose Percy Chiedu	Numerical and Geomorphological Characterization of Wave Dynamics Effects on the Mechanisms of Sedimentations at Some Vulnerable Units in Nigeria Coasts
12	Abugu, Solomon Ogbonna and Nweze Vitalis Onyekachi	Transforming Maritime Education and Training in Nigeria: Challenges, Opportunities, and Strategic Pathways
13	Dr. Maureen Nwando Onyejebu	Exploring the tourism potentials in maritime industry for national development
14	Sochima Vincent Egoigwe and Timothy Oluwaseun Araoye	Prediction of Fault in Three-phase Induction Motor using Machine Learning
15	Obiora B. U., Ezeasor C. I., Dimoha N. C., and Ewoh J.	Sustainable Biodiesel from Underutilized Seed Oils
16	Uzochukwu, I. Ozumba, Echezona Davidson Chukwujekwu, Cordelia O. Idoko, . and Paul C. Ezinna,	Oil Theft and Ocean Pollution: Implications for Sustainable Blue Economy in Nigeria.
17	Ofurumazi, Righteousness Pereowei	Comparative Analysis of the Impact of Single Window Implementation on Trade Efficiency: A Case Study of the Port of Lomé and Major Nigerian Seaports



Panel 2: Socio-Legal Frameworks, Human Rights, Law and Governance for a Sustainable and Equitable Ocean Economy

Panel Chair: Anyachebelu, Nnamdi Chijioke,

Rapporteur: Odinnaka Ofoma

Time: 10am - 1pm

Join Zoom Meeting:

Socio-legal perspectives of sustainable Ocean Economy, Legal frameworks and policies for sustainable resource management, Community -based dividends of Community -based Marine Resources Management, Human Rights and Marine Labour Laws, Shipping, Ports Management and Operations, Trade and Environmental Regulations in Maritime Business, Marine Law, Policy and Governance		
S/N	Names of author (s)	Paper Titles
1	Joshua Egbeegbe and Fidelia Azuka Okeke	Socio-Pragmatic Analysis of the Language of Nigerian Human Rights and Marine Labour Laws
2	Anyachebelu, nnamdi chijioke, phd	The Case for Specialized Environmental Courts: Enhancing Legal Efficiency and Expertise in Environmental Protection
3	Chinedu Okoye, Salifu Achile Momoh, Eze Uchenna Hyginus, and Dariyem Nandi Kruslat	Options for Harnessing Solar Power within Nigeria's Blue Economy
4	Chidera Dennis Ugwuegbu Esq	Socio-Legal Perspectives on a Sustainable Ocean Economy: Navigating Legal Frameworks and Social Policies for Equitable Marine Stewardship
5	Ukam, Leonard Edadi	The Implication of Population Pressure on Marine / Rural Resource of Ibini Community, Biase Local Government Area, Cross River State, Nigeria
6	Anikwe, Sunday Obinna	Seafarer Well-Being in a Post -Pandemic World: HR Strategies for Mental Health, Safety, and Retention under Evolving Marine Labour Laws
7	Ukpai, Ukpai Eni and Ukpong, Philip Efiog	Exploring the critical Nexus in Informal Cross-Border Trade between Nigeria and Cameroon: Implications for Policy Reform in Nigeria
8	Romanus Ugwuanyi Onyeka, Dr. Umoh, Boniface .D., and Onuora Adaeze Cynthia	Community-Based Marine Resource Management (CBMRM) and Local Community well-being
9	Dike, Remigius Amarachi, Ewelukwa, Onyebuchi Nkemjika, Emmanuel Nnaemeka Nwambam, Okolie Emeka Nathaniel, and Emezue, Ijeoma Joy	Legislative and Institutional Framework for Ocean Governance in Nigeria
10	Nwosu Chinenye Racheal and Okolo-obasi, Nduka Vitalis Elda	The Impact of Language Diversity on Seafarers' Productivity in the Nigeria Maritime Industry
11	Nduka Vitalis Elda Okolo -Obasi, Emmanuel Ejiofo Nwamuoh, and Ijeoma Joy Emezue	Coastal Women Empowerment in Rural Communities: The Role of Corporate Social Responsibility in Nigeria's Oil producing Region



12	Dr. Edwin C. Arum, Dr. Clara Obi - Ochiabutor, Dr. Ebelechukwu Lawretta Okiche, Dr. Chinwe Ekwelem, and Dr. Obinne Obiefuna	Sustainable Exploitation devoid of susceptible Expropriation of the Sea: Towards a Balanced Economic Expansion
13	Ufia Friday Michael and Okon Nse Bassey	Port Operations and Port Sustainability in Nigeria: A Study of Onne and Port Harcourt Ports
14	Sunday Areji, Attamah Ikechukwu Joseph	Management of Maritime Navigational Aids for Safe Passage of Ships on Ocean/Coastal Waters in Nigeria
15	Ifeyinwa David-Ojukwu, Florence O. Orabueze, and Stella U. N. Okoye-Ugwu	Contextualising queer identity and pollution of Nigeria's social order in selected #EndSARS placards
16	Virginia Eze, Florence Orabueze, Nnamdi Eze	Herbert Paul Grice's Conversational Competence and Stress Management in Maritime Business Administration
17	Dr. Oluchukwu Precious Obioma	Fair Seas, Fair Markets: The Role of Competition Law in Promoting Sustainable Marine Industries in Nigeria

Panel 3: Balancing Risk, Responsibility, and Resilience: Innovations in Maritime Safety, Conservation, and Climate Adaptation for a Sustainable Ocean Future

Panel Chair: Dr. Oluchukwu Precious Obioma

Rapporteur: Barr. Dike, Remigius Amarachi

Time: 10am - 1pm

Join Zoom Meeting:

Maritime Insurance, Risk Management, Security and Safety, Tourism and Hospitality Management, Pollution and Waste Management, Conservation and Ethics in Marine Resource Exploitation, Corporate Social Responsibility in Maritime Business, The Role of AI and Big Data in Marine Preservation, Climate Change, Sea-level rise and Coastal city Adaptation, Marine Biodiversity, Fisheries and Aquaculture Management		
S/N	Names of author (s)	Paper Titles
1	Topic Peremobowei Akoje and Simeon Nwabueze Osogu	Maritime Safety Communication and Risk Management Practices among Boat Operators, Staff and Students of Nigeria Maritime University
2	Ikechukwu Chime	The Role of Artificial Intelligence and Big Data in Marine Preservation
3	J. C. Ewoh, M. J. Okoro, I. C. Ezeasor, V. E. Nnadi, B. U. Obiora and G. N. Nnoli	Transportation Security of Dual - Use Chemicals from Seaports/Airports to Warehouse(s) in Nigeria
4	Joannah Ngozi Ajogwu and Sharon Julius Eddie	Overcoming Effects of Marine Plastic Litters in the Protection of the Marine Environment in Nigeria: The Way Forward



5	Dr. Ejiofor, Chukwuemeka Chinedu and Dr. Ogu, Esomchi Chris-Sanctus	Maritime Security and Administration in Nigeria: Rethinking the impact of the Nigerian Maritime Administration and Safety Agency (NIMASA)
6	Fred Emeka Achoru, Rachel Ngozi Ogwo, Josiah Ogbuka, Emeka Bright Ogbuene, and Anwara Obianuju	Effect of Port Waste Management on Performance of Selected Seaports on Nigeria
7	Otuu Fred Chibuisi I, Maryann Okwuoma Okeke, Glory Chineze Okeke, and Nubila Nkoyo Imelda	Pollution and waste management in Nigerian maritime ecosystem - the problems of today, the challenges of tomorrow
8	Abugu, Solomon Ogbonna () and Jombo Chioma Patricia	Corporate Social Responsibility in Nigeria's Maritime Sector: Fostering Sustainable Growth and Impact
9	Okoro Ngozi Uchenna, Iyke-Ofoedu Maureen Ifeoma, and Chinda Chimkamma Collins	Conflict Management strategies and Employee performance in deposit money banks in Nigeria
10	Adaora Chinelo Uzochukwu and Ilodilibe Linda Lucy	Effect of Survival Strategies on Performance of Small Medium Enterprise in South-East Nigeria: mediating role of marketing principles
11	Edith Chuka-Odenigbo and Okolo-obasi, Nduka Vitalis Elda	Plastic Pollution and Human Health in Nigeria: An Analysis of Exposure Pathways and Health Risks
12	Dr. Ozioma Nwokedi and Oge Oladele Olatunbosun	Audience Perception of Media Coverage of the 2023 Fuel Subsidy Removal in South-East Nigeria
13	Obiananma Krystal Okafor; Chienye Ifeanyichukwu Okafor; Linda Ajike; Chinyere Onwuama	Corporate Social Responsibility in Maritime: Navigating Ethical Waters
14	Emmanuel C. Anizoba & Sarah-Ruth Ushang Egoigwe	Ethical Implications of Pollution and Waste Management
15	E.B. Ogbuene, H. O. Eze, V.A. Ozorme and F.E. Achoru	Effect of Mining activities on Water Quality of Akwukwo River and its Tributaries in Ivo, Southeastern Nigeria
16	Joy William Undie Atsa and Uzochukwu Cornelius Ugochukwu	Assessment of Heavy Metal Pollution of Streams Contiguous to Quarry Sites in the Southern Cross River State, Nigeria
17	Ezeji Felix N., . and Okeke Henry, K., .	Maritime Security and Nigeria's Economic Development
18	Ejike Ubani	Chemical Pollution of Marine Environment and Blue Economy Challenges in Nigeria



19	Adobu, Ugbede Shadrach, Fred Emeka Achoru, Ale, Oluwakemi Elizabeth, Omale, Moses. O And Emmanuel, Julius	Pollution and Waste Management in Nigerian Maritime Ecosystem for Economic growth and Marine Preservation
20	Chukwunonso B. Nnaji	Assessing the Effect of Noise Pollution on Blue Economy Sustainability in Lagos Atlantic Ocean Nigeria
21	Uchenna Ezeoha	Heavy Metal and Polycyclic Aromatic Hydrocarbons Pollution of Agangwu River, Enugu, Nigeria: Assessment of Human Health Risk Exposure
22	Ajogu, Agbaji Pappy	Ecological and Human Health Risk Assessment due to Heavy Metal Pollution of Banda-Kabawa Farming areas in Lokoja, North Central Nigeria
23	Amadi Gloria Ekenedilichukwu, Amadi Kingsley Chinedu, & Paul C. Ezinna,	Global Warming and West African Monsoon Rain: Implications for Sustainable Development Goal 2
24	Christopher George Eze, Dr. Okechukwu Timothy Umahi and Christopher Pius Eze	Maritime Pollution Mitigation: Techniques for Long-Term Economic Development
25	Ngini Chinelo Vivian and Emeka Geoffrey Ede	Coastal Development and the Impact of Climate Change on the Marine Ecosystem in Nigeria
26	Ogbonna Okechukwu Mathias, Abugu, James O, E. E. Nwanmuoh, and Ibrahim Jafaru Itopa	Effect of Corporate Social Responsibility on the growth of Maritime industry in Port Harcourt Rivers State
27	John I. Offor, C. N. Madu and U.C. Ugochukwu	Lead Pollution: Effects on Growth of Amaranthus grown in Contaminated Sandy Soil and Health Risk Analysis

Abstracts



**POLLUTION AND WASTE MANAGEMENT IN NIGERIAN MARITIME
ECOSYSTEM - THE PROBLEMS OF TODAY, THE CHALLENGES OF TOMORROW**
**Otuu Fred Chibuisi^{1*}, Maryann Okwuoma Okeke², Glory Chineze Okeke³, Nubila Nkoyo
Imelda⁴**

¹Department of Science Laboratory Technology, Faculty of Physical Sciences, University of Nigeria, Nsukka;

²Department of Environment, Nigerian Port Authority, Lagos;

³Department of Agricultural and Bioresources Engineering, Enugu state University of Science and Technology, Agbani;

⁴Department of Pharmacology and Therapeutic, University of Nigeria, Enugu Campus

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Abstract

While the growth of maritime transport makes maritime ecosystem key contributors to the social and economic development of Nigeria, it also impacts negatively on good environmental sustainability. This study reviewed the current environmental pollution and waste management problems and the future challenges associated with Nigerian maritime activities. The review searched the PubMed/MEDLINE and Google Scholar data bases between 2020 and 2024, to review relevant scientific literatures on the Nigerian maritime environmental pollution and waste management. It also conducted general Google search engine inquiries using key words associated with marine pollution subject areas and supplemented the peer-reviewed literature with information from data sources including news reports, press releases, organization websites, and program and intervention descriptions. All of the thirteen (100%) relevant literatures reported that environmental pollution resulting from maritime activities is one of the prevailing problems confronting maritime ecosystem. Most of the literatures, 7(53.85%) implicated cargo shipping transportation in the pollution and 4 (30.75%) associated illegal oil bunkering and pipeline vandalization with the pollution. The problem with maritime transport range from waste dumping, non-indigenous organisms' diffusion and oil spills to the harmful atmospheric emissions. Poor adherence by most stakeholders to the provisions of all enabling international instruments as provided for by the International Maritime Organization (IMO) is a big challenge in the future management of maritime pollution and waste. Though this is not a systematic review, through this detailed examination the review aims to raise awareness of the need to strengthen enabling international and national instruments for effective marine pollution management.

Keywords: Maritime, environmental pollution, waste management, ecosystem, shipping transportation



ETHICAL IMPLICATIONS OF POLLUTION AND WASTE MANAGEMENT

Emmanuel C. Anizoba^{1*}, Sarah-Ruth Ushang Egoigwe²

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Abstract

The escalating challenges of pollution and waste management are among the most pressing issues of the 21st century, carrying profound ethical implications for individuals, corporations, and governments worldwide. Pollution, in its many forms air, water, soil, and noise has devastating effects on ecosystems, public health, and biodiversity. Meanwhile, the increasing volume of waste generated by human activity, coupled with inadequate disposal methods, exacerbates environmental degradation and resource depletion. This paper examines the ethical dimensions of these issues, focusing on principles such as sustainability, justice, and intergenerational equity to advocate for responsible environmental stewardship. Central to the discussion is the concept of environmental justice, which highlights the disproportionate burden of pollution and waste on marginalized communities and developing nations. These groups often lack the resources or political influence to mitigate environmental harm, raising questions of fairness and moral accountability. Additionally, the study explores the ethical responsibilities of corporations, emphasizing the need for transparency, accountability, and the adoption of sustainable production and waste management practices. Consumer behavior also plays a significant role, as ethical consumption and waste reduction are critical in driving systemic change. Technological innovation, policy reform, and public education are identified as essential components in addressing these challenges. This paper advocates for a global, cooperative approach to pollution and waste management, underscoring the moral obligation to protect the planet's ecosystems and ensure a healthy, sustainable environment for future generations. By integrating ethical frameworks with practical solutions, this study aims to inspire action and contribute to the ongoing dialogue on sustainable development and environmental ethics.

Key words: Ethics; Implication; pollution; Waste management; Environment

Fair Seas, Fair Markets: The Role of Competition Law in Promoting Sustainable Marine Industries in Nigeria



Dr Oluchukwu Precious Obioma

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Abstract

Nigeria's marine industry plays a vital role in economic growth, supporting fisheries, shipping, and offshore energy exploration. However, anti-competitive practices, regulatory inefficiencies, and environmental degradation threaten the sustainability of this sector. Large corporations often dominate marine industries, restricting market access for smaller players, while weak enforcement of competition laws enables monopolistic behaviour that prioritizes profit over environmental protection. Competition law, if effectively applied, can serve as a tool to ensure a level playing field, encourage innovation, and promote sustainability in Nigeria's marine economy. This study examines how competition law can foster sustainable marine industries in Nigeria by addressing monopolistic practices, unfair trade restrictions, and regulatory weaknesses that hinder environmentally responsible economic growth. It identifies challenges such as market dominance by a few corporations, weak institutional enforcement, and the absence of sustainability-focused competition policies. Using a doctrinal research design, the study conducts a legal analysis of Nigeria's competition law framework, including the Federal Competition and Consumer Protection Act (FCCPA) 2018, and compares it with international best practices. Findings reveal regulatory gaps in enforcing competition rules within marine industries, limited focus on sustainability, and weak penalties for environmental violations. The study recommends stronger enforcement mechanisms, integration of environmental concerns into competition law, and greater support for small and medium enterprises (SMEs) in the marine sector. In conclusion, a robust competition law framework that aligns with sustainability objectives will not only enhance economic growth but also safeguard Nigeria's marine ecosystem for future generations.

Keywords: Competition Law, Federal Competition and Consumer Protection Act (FCCPA) 2018, Nigeria, Sustainable Marine Industry, Marine Ecosystem.

EFFECT OF MINING ACTIVITIES ON WATER QUALITY OF AKWUKWO RIVER AND ITS TRIBUTARIES IN IVO, SOUTHEASTERN NIGERIA.

E.B. Ogbuene¹, H. O. Eze¹, V.A. Ozorme¹ and F.E. Achoru²



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Abstract

Water is one of the basic needs of man. The residents of most rural areas depend highly on surface water supply. It is often challenging to assess the quality of water intended for domestic use. The Akwukwo River and its tributaries serve as a primary water source for the rural residents of IVO. However, the area has recently experienced a surge in mining activities, raising concerns about the potential impact on water quality. This study assessed the pollution level of the Akwukwo River and its tributaries due to increasing mining activities in the study area. The study aims to determine the physical properties of water samples within the study area; measure the heavy metal concentration in the water samples from Akwukwo River and its tributaries; compare the physical and heavy metal properties of the water samples with the NESREA permissible limits and determine the water quality index from the samples of Akwukwo River. The study adopted experimental method and purposive random sample was adopted in the process of water sample collection from the Akwukwo River and its tributaries, at varying distances. Water samples collected were analyzed in the laboratory. The result of the physicochemical test showed that the TSS ranged from 2.0 ± 0.28 mg/l to 10.5 ± 1.13 mg/l; Pb from 0.015 ± 0.00 mg/l to 0.033 ± 0.00 mg/l; Cd ranged from 0.092 ± 0.11 mg/l to 1.46 ± 0.00 mg/l; Cu concentration ranged from 0.701 ± 0.00 mg/l to 2.881 ± 0.01 mg/l. The mean concentrations of TSS, DO and BOD exceeded their respective NESREA Standards, whereas, TDS, SO₄²⁻, NO₃⁻ and COD were all within their respective NESREA Standards. The mean concentrations of the heavy metals Zinc (Zn), Lead (Pb), Cadmium (Cd) and Copper (Cu) were all above their NESREA permissible limits whereas Iron (Fe) was within its NESREA regulatory limit. The water quality index (WQI) recorded was 81338, 59828, 65030, 75861, 50959 and 209511 at Pt1, Pt2, Pt3, Pt4, Pt5 and Pt6 respectively. These extreme WQI values highlight the detrimental impact of mining activities within the water catchment area. Urgent measures are required to address this issue, including raising awareness and providing education in local dialects about the health risks of using the contaminated stream for domestic purposes.

Keywords: Water quality, Mining, Activity, River and Tributaries.

LEAD POLLUTION: EFFECTS ON GROWTH OF AMARANTHUS GROWN IN CONTAMINATED SANDY SOIL AND HEALTH RISK ANALYSIS

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Abstract

The present study evaluated the effects of levels of lead contamination on growth of *Amaranthus* and the health implications of consuming such vegetable. The experiment was mounted in a greenhouse at Alvan Ikoku Federal University of Education Owerri. The study investigated uptake and accumulation of lead, assessed effects of lead on growth of the plant; and computed health risk assessment for the lead. Lead (II) nitrate [Pb(NO₃)₂] was procured and used for the study. The study had five treatments and three replicate. 2.5kg soil was used for each treatment, and a soil -lead concentrations of 0mg/kg, 500mg/kg, 1001mg/kg, 1502mg/kg, 2002mg/kg. Data on health risk were computed using standard formulae. Samples of soil and vegetables were sent to the laboratory for analysis of heavy metals to determine uptake. Growth variables were monitored fortnightly. All Data were subjected to One-way ANOVA. Results showed that Lead uptake were significantly different across treatments. Lead significantly affected growth of plant. Health risk index (HRI) and Lifetime cancer risk (LCR) showed that plant produced from the soils were not all safe. The Study concluded that *Amaranthus* has capacity to take up Lead from the soil, which affects its growth behaviors.

Keywords: Lead uptake, plant growth, health risk, *Amaranthus*, bioconcentration

TRANSPORTATION SECURITY OF DUAL - USE CHEMICALS FROM SEAPORTS/AIRPORTS TO WAREHOUSE(S) IN NIGERIA

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Abstract

This study investigated transportation security of dual - use chemicals from seaports/airports to warehouse(s) in Nigeria. This study used purposive sampling technique in choosing the five states of Lagos, Rivers, Enugu, Kano, Kaduna and Abuja (Federal Capital Territory) as places in Nigeria that have either international airport and or seaport through which these dual-use chemicals are imported into the country. The ten dual-use chemicals studied in this research were ammonium nitrate (NH₄NO₃), urea also known as carbamide (CO(NH₂)₂), urea-formaldehyde also known as urea-methanal [(O) CNHCH₂NH]_n, Nitro-glycerin, (C₃H₅N₃O₉), potassium chlorate (KClO₃), urea



nitrate ($\text{CH}_3\text{N}_3\text{O}_4$), trinitrotoluene-TNT ($\text{C}_7\text{H}_5\text{N}_3\text{O}_6$), sulfuric acid (H_2SO_4), nitric acid (HNO_3) and toluene also called methylbenzene (C_7H_8). They were selected using random sampling technique. After data were collected with questionnaire and analyzed, it revealed that the security of dual-use chemicals of concern is affected when the chemical is transported from seaports/airports to warehouse(s). (TVE= 96.353%, KMO = 0.934, P = 0.000). As shown in this research, there are unfortunately many examples where they have caused harm either by accident or deliberately. Practicing chemists and chemical safety professionals need to be aware of the dual-use properties of many commonly used chemicals.

Keywords: Transportation, Security, Dual - Use - Chemicals, Seaports/Airports and Warehouse(s).

SOCIO-LEGAL PERSPECTIVES ON A SUSTAINABLE OCEAN ECONOMY: NAVIGATING LEGAL FRAMEWORKS AND SOCIAL POLICIES FOR EQUITABLE MARINE STEWARDSHIP

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Abstract

The sustainable ocean economy has emerged as a critical focus in global efforts to address environmental degradation, economic inequality, and social injustice. This article delves into the socio-legal perspectives of a sustainable ocean economy, exploring how legal frameworks, social policies, and economic strategies intersect to promote the sustainable use and conservation of ocean resources. By examining international conventions, national legislations, and grassroots initiatives, the article highlights the role of law in fostering sustainable practices, protecting marine biodiversity, and ensuring equitable access to ocean resources. It also investigates the social dimensions of the ocean economy, emphasizing the importance of inclusive governance, community participation, and the protection of the rights of marginalized populations, such as coastal communities and indigenous peoples. Through case studies and comparative analysis, the article underscores the challenges and opportunities in achieving a balanced and integrated approach to ocean sustainability. The discussion aims to provide insights into how socio-legal mechanisms can be leveraged to support sustainable development goals, mitigate the impacts of climate change, and create resilient ocean economies that



benefit all stakeholders. Ultimately, this exploration seeks to contribute to the broader discourse on sustainability, offering practical recommendations for policymakers, legal practitioners, and advocates striving to harmonize economic growth with environmental stewardship and social equity.

Keywords: Sustainable Ocean Economy, Socio-Legal Perspectives, Environmental Stewardship, Inclusive Governance, Marine Conservation.

CORPORATE SOCIAL RESPONSIBILITY IN MARITIME: NAVIGATING ETHICAL WATERS

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Abstract

Corporate Social Responsibility (CSR) has become an integral part of modern business practices, especially in industries with high environmental and social impact, such as maritime business. This study explores the role of CSR in maritime operations, focusing on sustainability, ethical considerations, and stakeholder engagement. Using a qualitative research approach, data was collected through in-depth interviews and analyzed using NVivo for thematic coding. The study is anchored in the Triple Bottom Line (TBL) theory, Stakeholder Theory, and Institutional Theory. Findings reveal that CSR initiatives in maritime business improve environmental stewardship, enhance company reputation, and foster economic development in coastal communities. However, challenges such as regulatory inconsistencies and financial constraints hinder full-scale adoption. The study recommends strategic stakeholder collaboration, policy reforms, and increased corporate investment in sustainable maritime practices.

Keywords: Corporate Social Responsibility, Regulatory Compliance, Stakeholder Engagement, Maritime Sustainability, Environmental Ethics



PREDICTION OF FAULT IN THREE-PHASE INDUCTION MOTOR USING MACHINE LEARNING.

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Abstract

The prediction of faults in three-phase induction motors is crucial for maintaining the reliability and performance of industrial systems. This paper explores the application of machine learning techniques for early fault detection and diagnosis in three-phase induction motors. Using a comprehensive dataset of motor operating parameters, including vibration, current, and temperature, various machine learning models such as decision trees, support vector machines, and neural networks are trained and tested to classify fault types and predict motor health status. The study compares the effectiveness of different algorithms based on accuracy, precision, recall, and F1 score, highlighting their potential to detect common faults such as bearing defects, rotor bar failures, and stator winding issues. The results demonstrate that machine learning approaches, particularly deep learning, offer high prediction accuracy and can significantly reduce downtime by enabling proactive maintenance. The findings underline the importance of integrating predictive maintenance systems with industrial motors, ultimately contributing to enhanced operational efficiency and cost savings in manufacturing and power systems.

Keywords: Three-phase Induction Motor, Machine Learning, Faults detection, Decision Trees, Support Vector Machines, and Neural Networks

EFFECT OF PORT WASTE MANAGEMENT ON PERFORMANCE OF SELECTED SEA PORTS IN NIGERIA

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Abstract



This study examines the impact of port waste management on the operational performance of selected seaports in Nigeria. Waste management encompasses the collection, transportation, and disposal of waste materials, including garbage, sewage, and other byproducts. Effective waste management in Nigerian ports has been hindered by several challenges, including administrative inefficiencies, legal constraints, technological limitations, and inadequate infrastructure and support services. This research seeks to identify best practices in port waste management to support port performance in Nigerian seaports. Data for the study were collected from both primary and secondary sources. Primary data were obtained through structured questionnaires and oral interviews with relevant stakeholders, while secondary data were gathered from an extensive literature review. The research instruments comprised structured questionnaires with both closed- and open-ended questions. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS), and Pearson's correlation was employed to test the research hypotheses. The study reveals that initiatives such as the installation of incinerators and the use of oil filtering equipment has a substantial effect on port operations. The use of sewage treatment equipment positively influences the operational performance of Nigerian seaports, while the adoption of grinders and recycling mechanisms improves overall waste management efficiency. The study recommends that proactive measures be taken to mitigate the environmental pollution risks associated with shipping activities. Port waste reception facilities should be developed and prioritized. A phased approach to implementing waste management initiatives is advised, ensuring that Nigerian seaports progressively adopt sustainable and efficient waste disposal practices.

Keywords: Waste management, Ports, Port performance, waste management, Recycling

SOCIO-PRAGMATIC ANALYSIS OF THE LANGUAGE OF NIGERIAN HUMAN RIGHTS AND MARINE LABOUR LAWS

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Abstract

The beauty of language is found in its usage in different contexts, disciplines, and professions or occupations. Different professions tend to use language differently in relation to jargon, meaning and norms. The maritime and seafarers' language use, jargons, laws, and written human rights of workers have not been given adequate linguistic attention over the year hence, the occasional incidental misinterpretations and default of the law(s) intended for orderliness in the system. This paper presented a socio-pragmatic analysis of human rights and marine labour laws in Nigeria. Qualitative research design was employed. Human right and Maritimes laws and jargons in Nigeria



as contained in International Maritime Laws, and Nigerian Maritime Administrative and Safety Agency (NIMASA) constituted the over-all population. Ten maritime jargons and twenty legal and human right excerpts were drawn using purposive sampling as working population. Data were generated through critical study of maritime laws, human rights, and jargons, selecting the salient and consequential ones for analysis. Textual analysis was used as method of data analysis. Referential Theory of Meaning by Ogden and Richard, and VARIES model by Don and Alleen were adopted as theoretical framework. The study revealed that Maritimes seafarers used certain special occupational jargons that are cryptic. It was also found that some of the human rights and marine labour laws are ambiguous and ineffective attracting opposition, but for extensive pragmatic analysis, intended meanings are deducible. The study therefore demonstrated the significance of linguistic investigation into administrative and international agencies like Maritimes for better socio-political and economic development. It was recommended that Speech Act Theory should be applied to Maritime labour laws, human rights, and jargons to showcase the actions portrayed. It was further recommended that Feature Percolation Theory by Liesba should be applied to Maritimes administration and language use to expose the predominant syntactic and morphological structures found in their edicts and language.

Keywords: Language, Socio-pragmatic, Maritimes, Seafarers, Law, Human right.

POLLUTION AND WASTE MANAGEMENT IN NIGERIAN MARITIME ECOSYSTEM FOR ECONOMIC GROWTH AND MARINE PRESERVATION

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Abstract

The paper examines pollution and waste management within Nigeria's maritime ecosystem, emphasizing its impact on economic growth and marine preservation. It provides a historical analysis of maritime pollution in Nigeria, identifying key sources such as point and non-point pollution sources, land-based pollutants, agricultural runoff, household/domestic waste, and marine litter/garbage. The effects of marine pollution are discussed in terms of ecosystem degradation, plastic waste accumulation, oxygen depletion, and eutrophication. To address these challenges, the study recommends several management strategies, including legislative and policy measures, technological advancements, public education and awareness, international collaboration, effective monitoring and enforcement, and the promotion of sustainable practices.



Keywords: Marine pollution, pollutants, economic impact, Nigeria, waste management.

COASTAL WOMEN EMPOWERMENT IN RURAL COMMUNITIES: THE ROLE OF CORPORATE SOCIAL RESPONSIBILITY IN NIGERIA'S OIL PRODUCING REGION

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Abstract

While women are often key actors in most blue economy activities, they are commonly excluded from making management decisions in the sector, often due to cultural norms. The objective of this investigation is to assess the impact of a new corporate social responsibility (CSR) model of multinational oil companies on development and empowerment of coastal community women in the blue economy of Nigeria's Niger Delta region. Adapting explanatory research design, a total of one thousand two hundred artisanal women involved in the blue economy were sampled across the coastal communities of Niger Delta. Results of the analysis indicate that artisanal women in blue economy have remained widely excluded from the Global Memorandum of Understandings (GMOUs) interventions as a result of cultural norms of the people. This implies that if the cultural norms of the Niger Delta communities continue to restrain direct participation of the artisanal women from GMOUs' intervention, achieving gender equity and cultural change would be limited in the region. The findings suggest that since blue economy which involves fishing and sea food collection, the traditional sources of livelihood of the people are no longer viable and have significantly declined due to environmental oil degradation, GMOUs' intervention structure could focus on women playing key roles in management and conservation decision in Niger Delta region of Nigeria.



Keywords: Inequality, Corporate social responsibility, Multinational oil companies, Blue economy, Coastal women, Rural communities.

THE CASE FOR SPECIALIZED ENVIRONMENTAL COURTS: ENHANCING LEGAL EFFICIENCY AND EXPERTISE IN ENVIRONMENTAL PROTECTION

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Abstract

As environmental challenges become more complex and urgent, traditional courts face limitations in effectively addressing environmental issues. This study argues for the establishment of specialized environmental courts to ensure more efficient, informed, and timely legal proceedings for environmental protection. These courts, staffed with judges and legal experts trained in environmental law and science, would be better equipped to handle the intricate legal and technical aspects of environmental disputes. By streamlining processes and creating a focused legal framework, specialized environmental courts could enhance consistency in rulings and foster greater public awareness and participation in environmental justice. Drawing on international examples, this study examines the potential benefits, including increased efficiency, expertise, and improved access to justice for communities and environmental organizations. The establishment of such courts could play a pivotal role in addressing the growing need for proactive and effective environmental governance.

Keywords: Environmental courts, environmental protection, specialized courts, environmental law, climate change, judicial efficiency, environmental justice, public awareness, legal frameworks, sustainability.

ASSESSMENT OF HEAVY METAL POLLUTION OF STREAMS CONTIGUOUS TO QUARRY SITES IN THE SOUTHERN CROSS RIVER STATE, NIGERIA

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Abstract

The study assessed the pollution status of three streams near quarry sites in Akamkpa, Cross River State. The three streams located near three functional quarries in three rural communities (Awi, Nsan and Old Netim) were sampled. Sample collection was carried out between April, 2023 and June 2024, for two wet and two dry seasons. A total of 216 water samples were collected and analyzed in the laboratory for heavy metals. Heavy metals: lead, copper, chromium, zinc, cadmium, nickel and barium were analyzed using atomic absorption spectrophotometer (AAS). Results indicate that the streams located at Awi and Old Netim communities had heavy metal concentration values that were significantly higher than that of Nsan community. The Nemerow Pollution Index for the three streams indicates that the stream located at Old Netim was the most polluted with heavy metals whereas the stream located at Nsan was not polluted and therefore may be suitable for drinking. Regular monitoring of the streams located at Old Netim and Awi communities is recommended as the Zn and Cd levels in these two streams were higher than Standard Organization of Nigeria (SON)/Nigerian Industrial Standard (NIS) permissible limits.

Keywords: Pollution, Heavy Metals, Streams, Quarry.

MARITIME SECURITY AND NIGERIA'S ECONOMIC DEVELOPMENT

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Abstract

The maritime sector is increasingly recognized as a vital resource provider and a critical driver of national growth and prosperity. Globally, the industry facilitates over 80% of international trade and generates trillions of dollars annually. Nigeria, a major oil-producing and exporting coastal nation, experiences high volumes of shipping activities that support international trade and drive sectors such as finance, insurance, real estate, and legal services. These interconnected industries



benefit from the maritime sector's operations, fostering national economic growth and development. A major determinant of the sector's stability and success is maritime security. The absence of effective security measures undermines the realization of the sector's full potential. As a response, the Nigerian government, through key agencies such as the Nigerian Maritime Administration and Safety Agency (NIMASA), has spearheaded initiatives to combat maritime crimes, particularly piracy and armed robbery at sea, in Nigeria and the broader Gulf of Guinea. Initiatives such as the Deep Blue Project and strategic partnerships with international maritime security organizations have enhanced Nigeria's ability to foster a business-friendly and secure maritime environment. Given Nigeria's 853 kilometers of coastline, maritime security remains a crucial economic and national security issue. This paper examines the evolving dynamics of maritime security in Nigeria, its impact on economic development, the government's contemporary efforts to sustain security, and the successes recorded thus far in mitigating maritime threats and fostering economic growth.

Keywords: maritime sector, maritime security, Nigerian Maritime Administration and Safety Agency, Economic Development.

NAVIGATING THE LEGAL IMPLICATIONS OF CARGO THEFT: THE ROLE OF AI IN MARITIME SECURITY.

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Abstract

Global trade relies on the maritime transport of goods, yet cargo theft remains a persistent threat, undermining economic security and legal frameworks. Despite its importance to international trade, maritime transportation is fraught with dangers and operational difficulties. Maintaining safety is crucial for preserving the environment, human life, and financial stability. Theft has remained a persistent problem in Nigeria, leading to significant financial losses. International trade and transportation depend heavily on maritime security to guarantee the safe and efficient passage of goods across the world's waters. Traditional security measures frequently fail to meet contemporary dangers as maritime activities become more complicated and large. With its cutting-edge solutions to improve maritime security, track possible threats, and guarantee adherence to international standards, artificial intelligence (AI) is becoming a game-changer. Artificial intelligence (AI)-powered technologies offer creative ways to improve maritime security, including real-time monitoring, predictive analytics, enhanced decision-making skills, and crew resource management. However, there are challenges facing the implementation which include data privacy, integration issues, and cost barriers. And lack of a robust legal regime to regulate artificial intelligence. Thus, this paper's goal is to investigate how artificial intelligence (AI) can



be used to control and prevent cargo theft in the marine industry. It is therefore recommended that there is the need to harmonize international laws to address AI use in maritime security.

Keyword: Maritime, security, cargo, theft, carriage of goods, and convention

TRANSFORMING MARITIME EDUCATION AND TRAINING IN NIGERIA: CHALLENGES, OPPORTUNITIES, AND STRATEGIC PATHWAYS

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Abstract

This paper explored the critical role of maritime education and training (MET) in Nigeria, a nation with significant maritime potential due to its strategic geographical location and abundant natural resources. Anchored on Human Capital Theory and Systems Theory, the article examines MET's historical evolution, current state, and challenges in Nigeria. It highlights gaps in infrastructure, funding, curricula, and regulatory oversight while emphasizing the opportunities for leveraging digitalization, international collaboration, and public-private partnerships to enhance MET. The paper concludes with actionable recommendations to strengthen Nigeria's MET framework, aligning it with global standards and ensuring the development of a highly skilled workforce to drive the maritime sector's growth. This systemic approach offers policymakers, educators, and industry stakeholders a roadmap to unlock the sector's economic potential.

Keywords: Maritime Education, Human Capital Theory, Systems Theory, Nigeria, Digitalization, Workforce Development

PORT OPERATIONS AND PORT SUSTAINABILITY IN NIGERIA: A STUDY OF ONNE AND PORT HARCOURT PORTS

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Abstract

Port operations can impact negatively on ports, hence making the ports unsustainable for efficient use. Studies on port sustainability have also been found to be concentrated on the environmental aspects while neglecting the social and economic implications, making it impossible to generalise the conclusions. The management of ports is also said to pay more attention to economic gains with little or no focus on developing strategies toward achieving social and environmental sustainability. This study was undertaken to examine the impact of port operations on the Triple Bottom Lines of sustainability of Nigerian ports adopting the United Nations' Sustainable Development Goals (UN SDGs) approach. The objectives of study include assessing the relationship between shipping and land transport activities and port sustainability; determining the relationship between port expansion activities and port sustainability. A cross-sectional survey research design was adopted for this study. The population of study comprised key management and operational staff in the two ports in Rivers State- Onne and Port Harcourt ports. Primary data were collected through questionnaires. Data were analysed statistically using Pearson Products Moment Correlation Coefficient (PPMC). The study concluded that port expansion and shipping and land transport activities have significant and positive relationships with economics, social and environmental sustainability in Onne and Port Harcourt ports. It was recommended that government (Ministry of Marine and Blue Economy) and other stakeholders in the port industry initiate and implement policies aimed at reducing the negative impacts of operations on ports.

Keywords: Port operations, sustainability, United Nations' Sustainable Development Goals, port sustainability, Nigerian ports.

THE ROLE OF ARTIFICIAL INTELLIGENCE AND BIG DATA IN MARINE PRESERVATION

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Abstract

The oceans and the earth's surface interact in numerous ways to support life, as approximately 70% of the earth's surface is covered by oceans, which are vital for the global economy, biodiversity, and climate regulation. However, these oceans are continually threatened by habitat destruction, climate change, acidification, pollution, and more. With the consequences of ocean degradation becoming increasingly evident, protecting the marine ecosystem has become a global priority. In this context, technological advancements and international commitment have led to the rise of Artificial Intelligence (AI) and a heightened awareness of big data management to help transform marine environmental challenges into opportunities for restoration and sustainable management. This article aims to contribute to the ongoing conversation and efforts to understand the significant role of AI and Big Data in marine preservation. It adopts an analytical approach using doctrinal research methodology, beginning with the contextualisation of the importance of marine preservation and the limitations that hinder conservation practices. It further explores the emergence of AI and Big Data along with the unique capabilities of these technologies in marine habitat preservation, emphasising the potential of AI in data analysis, real-time monitoring, predictive analysis, and more. The article also considers the sources, methods of collection, and storage of big data. Additionally, the synergy between AI and big data is analysed, projecting how their integration can foster more efficient marine preservation practices. The paper concludes with a summary of findings and recommendations for researchers, policymakers, and others, such as advocating for ethical and transparent AI practices, improving data management strategies, and promoting collaborative efforts.

Keywords: artificial intelligence, big data, technologies, resource management, marine preservation.

MARITIME SAFETY COMMUNICATION AND RISK MANAGEMENT PRACTICES AMONG BOAT OPERATORS, STAFF AND STUDENTS OF NIGERIA MARITIME UNIVERSITY

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Abstract



This paper investigates the imperativeness of improving safety communication and risk management practices among boat operators, staff and students of the Nigeria Maritime University, Okerenkoko, Delta State, Nigeria. The research objectives are to investigate the most prevailing safety hazards within the inland water ways transportation; examine the safety communication and risk management approaches and highlight strategies for risk prevention on maritime assets. The study employs a quantitative approach, relying on questionnaire as the research instrument. The sample size comprises 120 boat operators, staff and students of Nigeria Maritime University and the data were analysed using the SPSS. Result indicates that there is lack of commitment to safety culture and compliance with IMO-STCW standards. The findings reveal that the use of incompetent boat operators was the most prevailing maritime hazard in the study area. The study highlights the importance of safety communication, culture, regulatory compliance and professionalism for ensuring the safety, competence, and sustainability of maritime operations.

Keywords: Maritime, Assets, Safety Culture, Communication, Risk Management.

Overcoming Effects Of Marine Plastic Litters In The Protection Of The Marine Environment In Nigeria: The Way Forward1

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Abstract

Plastic products have greatly transformed our lives in more ways than one. In Nigeria, there is a ubiquitous presence of plastic products such as plastic bags, sachet water bags, plastic bottles, packages, food wrappers, cutleries, breads from cosmetic materials, cigarette butts, etc.

Unfortunately, most of these products are single-use-plastic, once used are discarded, causing plastic pollution that impacts all aspects of our environment, including the marine environment, marine living resources, human health and causing economic damage to activities such as tourism, fisheries and shipping. The main thrusts of this paper are to: (i) analyse an overview of the marine plastic pollution; (ii) evaluate nature of marine plastic pollutants; (iii) determine the effects of marine plastic pollution on both the natural and human environments; (iv) examine the efforts to control the polluting incident of marine plastic; and (v) suggest strategies in address the marine plastic menace in Nigeria. We suggest the adoption of strategy based on law, policy, technology, and enforcement that target priority pollution sources. The legislation shall provide an overarching framework for preventing, reducing, and otherwise managing marine plastic litter by integrating Extended Producer Responsibility and Circular economy models.

Beside this strategy, it is further suggested that the Nigerian Government manage plastic pollution, promote sustainability, integrate the issues of marine debris into national strategies dealing with waste management,



especially in the coastal zone, ports and maritime industries and develop appropriate economic incentives with the aim of reducing marine debris.

Keywords: Marine plastic, Litters, Marine environment, Protection, Way forward

MARITIME SECURITY AND ADMINISTRATION IN NIGERIA: RETHINKING THE IMPACT OF THE NIGERIAN MARITIME ADMINISTRATION AND SAFETY AGENCY (NIMASA)

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Abstract

World over, there is a growing recognition of the potentials of modern maritime industries. This focus has increased the need to develop maritime agencies which through environmental rules and regulations, are capable of enforcing compliance with a broad array of requirements in the areas of air and water quality, hazardous waste disposal, pollution and aquatic species protection. In Nigeria, the Nigerian Maritime Safety and Administration (NIMASA) is the regulatory body responsible for the safety of life at sea and environmental protection. Hence, this paper interrogates the impact of the Nigerian Maritime Administration and Safety Agency (NIMASA) on effective maritime security and administration in Nigeria. Using the structural-functional theory, data for the study was generated using the documentary method and was analyzed using the content method of analysis. Our findings suggests that the Nigerian Maritime Administration and Safety Agency (NIMASA) has not done enough to ensure efficient maritime security and administration in Nigeria as there exists a high rate of abuse of maritime resources in the country. This is evident in the way our rivers, oceans, and other critical waterways remain the easiest outlets to dispose of sewage and human garbage, animal, and industrial wastes. Based on this, it was recommended that the Nigerian Maritime Administration and Safety Agency (NIMASA) should take more proactive measures in their operations, and should collaborate with other relevant agencies to ensure adequate, efficient and effective Maritime Security and Administration in Nigeria.

Keywords: Maritime, Environment, Security, Administration, Resources

OPTIONS FOR HARNESSING SOLAR POWER WITHIN NIGERIA'S BLUE ECONOMY



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Abstract

As the world navigates the future of sustainable development, the integration of solar power within Nigeria's blue economy emerges as a pivotal strategy to bridge the gap between economic growth and marine preservation. This study explores the potential of solar energy to drive economic prosperity while safeguarding the country's marine ecosystems. With Nigeria's vast coastline and abundant sunlight, the focus is on harnessing solar power for various marine applications, including floating solar farms, solar-powered desalination, marine transportation, and aquaculture. The research employs a qualitative case study approach, analyzing global precedents, Nigerian case studies, and expert interviews to identify successful solar energy applications within blue economies. The findings reveal promising options, such as floating solar farms in Singapore, solar-powered desalination in the UAE, and solar-driven marine transportation in Norway and India. These global case studies offer valuable lessons for Nigeria's unique coastal and marine environments. Despite challenges like high initial costs and regulatory barriers, Nigeria's blue economy presents strategic entry points for solar power. Offshore and floating solar farms, solar desalination, and solar-powered marine transport can significantly contribute to energy security and environmental preservation. The study emphasizes the environmental benefits of solar energy adoption and its role in promoting marine biodiversity conservation. This paper highlights the importance of solar power in Nigeria's blue economy, offering a sustainable pathway for economic growth and environmental protection. By addressing the policy-related challenges, Nigeria can unlock the full potential of solar energy, aligning with global climate goals and its own sustainable development agenda.

Keywords: Harnessing, Solar Power, Blue Economy, Sustainable, Renewable and Energy.

COMMUNITY-BASED MARINE RESOURCE MANAGEMENT (CBMRM) AND LOCAL COMMUNITY WELL-BEING

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Abstract

Community-Based Marine Resource Management (CBMRM) has gained prominence as a sustainable approach to marine resource management and conservation. It has emerged as a key approach in addressing the depletion of marine ecosystems and the overexploitation of marine resources. This paper evaluates the effectiveness of CBMRM in improving the socio-economic and environmental conditions of local communities whose livelihoods depend on marine resources. By synthesizing findings from case studies in different coastal regions, this paper identifies both the successes and limitations of CBMRM as an adaptive, participatory management model. The findings suggest that while CBMRM enhances resource sustainability and empowers local communities, it faces challenges related to governance, external pressures, and financial sustainability. This paper provides recommendations for strengthening CBMRM initiatives to ensure more resilient and thriving coastal communities.

SUSTAINABLE EXPLOITATION DEVOID OF SUSCEPTIBLE EXPROPRIATION OF THE SEA: TOWARDS A BALANCED ECONOMIC EXPANSION

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Abstract

The growing global economy is putting more pressure on oceans and coastal areas, which are essential for trade, food, energy, and biodiversity. However, overuse, pollution, and climate change are harming these vital ecosystems. For example, incidents like the Ever Given ship blocking the Suez Canal in 2021 and the loss of coral reefs show how fragile these systems are. This paper explores ways to balance economic growth with protecting marine life, ensuring a sustainable future for both people and the planet. Using the doctrinal research methodology this study explores



strategies for sustainable use of the living and nonliving resources of the sea without hindering the ability of the sea to replenish itself. Case studies from Norway's sustainable fish farming and Indonesia's mangrove restoration programs provide real-world examples of balancing economic and environmental goals. Data from global fisheries and coastal development projects were analyzed to assess the impact of current practices and the potential benefits of alternative approaches. Policy reviews focused on international agreements, such as the UN Sustainable Development Goals (SDG 14), and national strategies for marine conservation. The findings reveal that integrating sustainable practices can significantly reduce harm to marine ecosystems while supporting economic growth. For instance, Norway's aquaculture industry has thrived by adopting strict environmental standards, and Indonesia's mangrove restoration has boosted both biodiversity and local livelihoods. The study also highlights the importance of global cooperation and innovative technologies, like satellite monitoring, in achieving these goals. This paper shows that balancing economic growth and marine preservation is not only possible but essential for a sustainable future.

Keywords Sustainability, living resources, exploitation, oceans, seas, biodiversity

ASSESSING THE EFFECT OF NOISE POLLUTION ON BLUE ECONOMY SUSTAINABILITY IN LAGOS ATLANTIC OCEAN NIGERIA

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Abstract

This paper presents the effect of noise pollution on the blue economy development in the Atlantic Ocean of Lagos State, Nigeria. The study aims to analyze the impact of noise pollution on marine animals. Analytical research was the methodology used to express marine animals' challenges due to noise pollution. Atlantic oceanic in Lagos was used as a reference point to buttress the challenges noise pollution can cause to marine animals which affects the blue economy sustainability. The sources of noise pollution on aquatic life in the Atlantic Ocean were outlined and their impacts were discussed. Sources such as motor vehicles, speed boats, and other human activities were analyzed. The results of noise emitted from these sources were listed and explained.



It was recommended that the government should make policies to protect the blue economy. The study highlights the economic importance of developing, protecting, and securing the blue economy and its attributes.

Keywords: Noise Pollution, Blue Economy, Aquatic Environment, Marine Animals, Sustainability.

THE IMPLICATION OF POPULATION PRESSURE ON MARINE / RURAL RESOURCE OF IBINI COMMUNITY, BIASE LOCAL GOVERNMENT AREA, CROSS RIVER STATE. NIGERIA

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Abstract

There are obviously clear and significant indicators that our rural/marine resources as fast becoming depleted. The extent to which rural and marine yields have taken a down-ward turn poses a serious danger to the survival of the rural population. The very essence of environmental conservation is to ensure that man's wanton spirit of exploitation of the resources in the phase of increased population is controlled so as to strike a balance between the needs of the present generation and the chances of survival of the generation unborn. Whereas our forefathers, used religion, superstition and totemism to protect our terrestrial and aquatic ecosystem and handed it over to us intact, government regulatory policies on conservation of biodiversity has failed to protect the marine and forest resources in our modern days. Suffice this to mean that men fear religion and superstition more than government policies and extant laws when it comes to the exploitation of rural and natural resources. Ibini Community is a rural settlement whose inhabitants depend on farming and mostly on fishing as their basic occupation. The paper is the product of a survey carried out on the Ibini Erei Community in Biase Local Government Area of Cross River State, Nigeria. The focus was to ascertain the extent to which their economic activities (farming and fishing) have been affected by population increase. Questionnaires were used in the collection of such data as farm size, farm output, fish catch measured in basins (60cm³) and later converted to metric tons, types of fishing materials used, present and past population sizes as well as certain traditional conservation practices. The data obtained were statistically analyzed using the Pearson Product Moment Correlation, tested at 0.05 level of confidence. The result showed the population has a significant negative effect on the rural resources (Agriculture and Marine Resource). It has led to the excessive fragmentation of land, neglect of basic traditional approaches to conservation,



poor yields in both land and marine products. Poor income and other social vices. Practical recommendations to ease population pressure on rural resources including, establishment of cottage industries, development of infrastructural facilities and a stronger government presence through grants as well as other federal and state loan empowerment programs, have been suggested in this paper.

Keywords: Ibini, Population, Rural/ Marine Resources, Conservation, Exploitation, Fishing and Farming.

BLUE ECONOMY: THE RISK, CHALLENGES AND PROSPECTS IN NIGERIA.

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ABSTRACT

The Blue Economy is a recent field of study that encompasses economic activities that depend on the sea, often associated with other economic sectors, including tourism, maritime transport, energy and fishing. Lack of strong marine policy, weak ocean governance, and unsustainable use (e.g., Illegal, Unreported and Unregulated (IUU) fishing, marine pollution, haphazard tourism, and unplanned coastal development) can be the huge risk factor for the effective execution of the blue economy. Blue economic development should be in an eco-friendly way and a special focus must be on the conservation of the marine ecosystem. A blue economy roadmap is necessary to provide a comprehensive strategy for ocean-based sustainable development that brings together the economy, environment, and society closely linked to the UN 2030 Sustainable Development Goals (SDGs). The main purpose of this paper was to qualitatively investigate the issues of pathways to microplastic particles to the sea, to evaluate the impact of Illegal, unreported and unregulated fishing IUU), and to analyze prospects and challenges in developing marine resources in Nigeria and to suggest necessary recommendations. Existing literature and documents from secondary sources were reviewed. The paper revealed that the challenges in harnessing marine resources in Nigeria are an inadequate scientific data bank in ocean sustainability, the inability to harness and regulate fishing practices, the inability to control ocean litter and the inability to optimally maximize potential ocean resources. This paper recommends that the government need to enhance regulated fishing practices, reduce ocean litter and improve in harnessing ocean resources.



Keywords: Blue Economy, Marine Litter, Illegal Fishing, Ecosystem and Sustainable Development

MARITIME EDUCATION AND TRAINING IN NIGERIA: CHALLENGES AND PROSPECTS

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Abstract

About 90% of global trade by volume is seaborne and over 60% of all imports to West Africa are Nigeria bound. Hence, the men and women needed to carry out the day-to-day maritime job in Nigeria and elsewhere require the needed professional training for effective and efficient maritime sector service delivery. Maritime education and training are global in scope and as well as specialized area of learning, in the sense that the International Maritime Organization (IMO) through its conventions and member countries sets the rules and regulations for maritime education and training globally. Sequentially, the Nigerian maritime education and training system was established to provide training for all levels of manpower for the maritime sector. The aim of the study is therefore to access the challenges and prospects of Nigeria maritime education and training system. The study adopted systemic review and leveraged on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers as the framework of interpretation. The study discovered that the bulk of the problems of Nigeria Maritime education and training is centred on inadequate training and low-quality professional education. Consequently, the study recommended adequate investment in the education and training of Nigerian maritime professionals.

Key words: Maritime, Education, Professional, Challenges, Prospects. Heavy Metal and Polycyclic Aromatic Hydrocarbons Pollution of Agangwu River, Enugu, Nigeria: Assessment of Human Health Risk Exposure

Heavy Metal and Polycyclic Aromatic Hydrocarbons Pollution of Agangwu River, Enugu, Nigeria: Assessment of Human Health Risk Exposure

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Abstract

Agangwu river, a major source of water in the coal camp area of Enugu State used by both residents, artisans, farmers and for industrial processes is likely to be contaminated with heavy metals and polycyclic aromatic hydrocarbons (PAHs) that have the potential to pose health risks to the Agangwu residents that use the water for drinking, washing, bathing and cooking.

There is indiscriminate disposal of industrial, municipal, and hazardous wastes in the nearby areas to the River. This study assesses the pollution status of the Agangwu River potentially resulting from the above anthropogenic activities around the River. Water samples were collected following standard procedure. The heavy metals were analyzed using atomic absorption spectrometry (AAS) whereas the polycyclic aromatic hydrocarbons (PAHs) were analyzed using gas chromatography-mass spectrometry (GC-MS). Findings reveal significant contamination of water sources, with heavy metals such as lead, cadmium, and chromium exceeding WHO recommended limits and posing potential health risks to local communities. The study underscores the urgent requirement for sustainable waste disposal solutions, public awareness initiatives, and policy interventions to safeguard both environmental and public health in rapidly urbanizing regions like Enugu State.

Keywords: Surface water, Heavy metals, Polycyclic aromatic hydrocarbons (PAHs), Environmental pollution, Health risk assessment



**SEAFARER WELL-BEING IN A POST-PANDEMIC WORLD: HR STRATEGIES FOR
MENTAL HEALTH, SAFETY, AND RETENTION UNDER EVOLVING MARINE
LABOUR LAWS**

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Abstract

The COVID-19 pandemic exposed critical vulnerabilities in the maritime sector, particularly regarding seafarer welfare, as prolonged contracts, restricted shore access, and disrupted crew changes exacerbated mental health crises and safety risks. This study investigates how human resource management (HRM) practices in the shipping industry have adapted to address these challenges while complying with evolving international marine labour laws, such as the Maritime Labour Convention 2006 and its post-pandemic amendments. Through qualitative interviews with seafarers, HR managers, and maritime regulators, alongside analysis of organizational policies and compliance reports, this research identifies gaps and innovations in HR strategies. Key findings reveal that proactive mental health support systems, enhanced safety protocols, and transparent communication frameworks are critical to improving well-being and retention. However, disparities persist in enforcing these measures across flag states and shipowners, highlighting the need for standardized, legally aligned HR practices. The study concludes that integrating psychosocial risk assessments, crew welfare monitoring technologies, and culturally sensitive retention incentives can foster resilience in a post-pandemic maritime workforce. These insights offer actionable recommendations for HR professionals and industry stakeholders to harmonize labour law compliance with ethical workforce management in an increasingly complex global shipping environment.

Keywords: Seafarer well-being, Maritime Labour Laws, Mental Health, HRM Strategies, COVID-19, Safety, Employee Retention, Maritime Labour Convention (MLC) 2006.



**ECOLOGICAL AND HUMAN HEALTH RISK ASSESSMENT DUE TO HEAVY METAL
POLLUTION OF BANDA-KABAWA FARMING AREAS IN LOKOJA,
NORTH CENTRAL NIGERIA**

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Abstract

Heavy metals from time immemorial are known to leave a negative impact on soil as well as polluting the entire food chain system. This study evaluates the environmental and health impact of heavy metal contamination on soils and sediments of Banda-Kabawa farming area within Lokoja metropolis. Experimental research design and stratified sampling technique was used for the study. Soil samples were collected in wet and dry seasons. All samples were analyzed for heavy metals (Nickel (Ni), Iron (Fe), Lead (Pb), Copper (Cu), Chromium (Cr), Zinc (Zn) and Cadmium (Cd)) using Atomic Absorption Spectrophotometry (AAS). Findings from the study reveal that the mean concentration values in the soils were mostly in the decreasing order: Fe(17.6-65.6)>Zn(11.1-41.4)>Pb(4.7-18.2)>Cr(4.4-16.5)>Ni(2.3-16.0)>Cd(0.7-2.6) >Cu(0.5-3.0) for both seasons but with higher concentration values noticed during the dry season in Kabawa farming area. This implied that the farming activities may have mostly impacted the soils Kabawa farming area. The ecological risk of exposure as revealed by PERI for all sample locations indicated PERI<110 which implies low ecological risk of biological impairment arising from the toxic effect of the heavy metals in both dry and wet seasons. In estimating the human health risk of exposure to heavy metals, the HI<1 which implies that there was no non-carcinogenic risks of exposure to the heavy metals associated with contact and ingestion of the soil. Thus continuous environmental monitoring is required in the study area in order to advert potential environmental and health issues.

Keywords: Ecology, Heavy Metals, Agriculture, Pollution, Health risk



GLOBAL WARMING AND WEST AFRICAN MONSOON RAIN: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT GOAL 2

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Abstract

Monsoons are very important in many parts of the world that depends largely on subsistence agricultural farming. However, due to radiative forcing, the consequent climatic imbalance, giving rise to global warming and resulting to climate tipping points disruptions, such as drought and flooding, have made the call in the Paris Agreement to keep global warming to no more than 1.5°C imperative. As well as the United Nations Framework Convention on Climate Change (UNFCCC), call to reduce global emissions by 45% by 2030 and reach net zero emission by 2050. Current records indicate that vast areas of West and Central Africa are experiencing the worst floods in decades, deepening a record food-insecurity crisis, where about 55 million people are already going hungry. Hence, the aim of this study is to review global warming in relation to West African Monsoon rains and the implications to SDG 2 in the region. The study adopted systematic review and leveraged on Sustainable Livelihood Framework as the building block of interpretation. The study discovered that the global dominance and use of renewable energy will serve as one size fits-all solution to global warming and food insecurity crisis in West Africa and recommended the relegation or phase-out of fossil fuels as global dominant source of energy.

Keywords: Global Warming, Monsoon, rain, Flooding, West Africa.



SUSTAINABLE BIODIESEL FROM UNDERUTILIZED SEED OILS

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Abstract

Nigeria's petroleum reliance raises environmental, economic, and security concerns, with rising energy demands intensifying pollution and climate change. Biodiesel from organic oils presents a promising alternative but faces challenges in feedstock selection and production efficiency. This study investigates underutilized seed oils (*Hura crepitans*, *Alfezia africana*, *Jatropha curcas*) for sustainable biodiesel production, comparing the physicochemical properties of individual and blended oils to overcome feedstock limitations and ensure high-yield, quality biodiesel from local resources. The research examined biodiesel production potential using these underutilized seed oils from Nsukka, Nigeria, through key processes including oil extraction, solvent separation and recovery, blending optimization using Simplex lattice design, and single-stage alkali-catalyzed transesterification. Biodiesel yields ranged from 95.59% to 97.70%, demonstrating high conversion efficiency. Properties such as density (864.23–881.10 kg/m³), specific gravity (0.863–0.888 g/cm³), acid value (0.06–0.41 mgKOH/kg), kinetic viscosity (3.66–4.43 mm²/s), flash point (166.54°C–127.67°C), and cetane number (47.96–59.87) met ASTM D6751 standards, with significant variations ($p < 0.001$) reflecting formulation differences. The findings highlight the potential of underutilized seed oils for sustainable biodiesel production, achieving high yields and meeting quality standards. Blending oils and waste products effectively addressed feedstock challenges, supporting locally sourced biodiesel as a viable alternative to petroleum fuels in Nigeria.

Keywords: Biodiesel Production, Underutilized Seed Oils, Sustainability, Blending Optimization and ASTM D6751 Standards



TRANSPORTATION SECURITY OF DUAL - USE CHEMICALS FROM SEAPORTS/AIRPORTS TO WAREHOUSE(S) IN NIGERIA

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Abstract

This study investigated transportation security of dual - use chemicals from seaports/airports to warehouse(s) in Nigeria. This study used purposive sampling technique in choosing the five states of Lagos, Rivers, Enugu, Kano, Kaduna and Abuja (Federal Capital Territory) as places in Nigeria that have either international airport and or seaport through which these dual-use chemicals are imported into the country. The ten dual-use chemicals studied in this research were ammonium nitrate (NH_4NO_3), urea also known as carbamide ($\text{CO}(\text{NH}_2)_2$), urea-formaldehyde also known as urea-methanal $[(\text{O})\text{CNHCH}_2\text{NH}]_n$, Nitro-glycerin, ($\text{C}_3\text{H}_5\text{N}_3\text{O}_9$), potassium chlorate (KClO_3), urea nitrate ($\text{CH}_5\text{N}_3\text{O}_4$), trinitrotoluene-TNT ($\text{C}_7\text{H}_5\text{N}_3\text{O}_6$), sulfuric acid (H_2SO_4), nitric acid (HNO_3) and toluene also called methylbenzene (C_7H_8). They were selected using random sampling technique. After data were collected with questionnaire and analyzed, it revealed that the security of dual-use chemicals of concern is affected when the chemical is transported from seaports/airports to warehouse(s). (TVE= 96.353%, KMO = 0.934, P = 0.000). As shown in this research, there are unfortunately many examples where they have caused harm either by accident or deliberately. Practicing chemists and chemical safety professionals need to be aware of the dual-use properties of many commonly used chemicals.

Keywords: Transportation, Security, Dual - Use - Chemicals, Seaports/Airports and Warehouse(s).



INTEGRATING GIS-BASED FLOOD MODELLING AND ENGINEERING SOLUTIONS FOR SUSTAINABLE URBAN PLANNING FOR COASTAL CITIES IN THE FACE OF CLIMATE CHANGE

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Abstract

Climate change and sea-level rise pose significant challenges to coastal cities, threatening infrastructure, ecosystems, and communities. The integration of Geographic Information Systems (GIS) and civil engineering is crucial for developing adaptive strategies to enhance urban resilience. This study explores the role of GIS in spatial analysis, flood modeling, and risk assessment, alongside engineering solutions such as resilient infrastructure, seawalls, drainage systems, and sustainable urban planning. By combining geospatial data, remote sensing, and structural design principles, this research provides a framework for informed decision-making in coastal adaptation. The findings highlight the importance of interdisciplinary approaches in mitigating climate risks and ensuring sustainable, climate-resilient urban development. By leveraging remote sensing, spatial analysis, and predictive modeling, GIS provides valuable insights for policymakers and urban planners to enhance coastal resilience. The findings emphasize the importance of geospatial technologies in mitigating climate risks and fostering adaptive, sustainable coastal development.

Keywords: gis, climate change, flood modelling, engineering solutions, sustainable urban planning



OIL THEFT AND OCEAN POLLUTION: IMPLICATIONS FOR SUSTAINABLE BLUE ECONOMY IN NIGERIA.

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Abstract

Oil theft is transnational and runs through a shadow value chain involving local and international perpetrators. It's common among oil producing countries. Oil is the largest traded and stolen natural resource globally. Records have shown that Over half of the oil in global trade is stolen. From extraction, refining, loading and transloading in international waters, the ocean environment is deeply contaminated. Consequently, destroying ocean biodiversity, lives and livelihood, thereby hampering the global Blue Economy initiative of making sustainable use of ocean resources to create jobs, economic growth, and improved livelihoods. Hence, the aim of this study is to review the trend of oil theft, ocean pollution and the implications for Nigeria Blue Economy initiative. The documentary research approach was adopted for the study while Sustainable Livelihood Framework (SLF) is the theoretical foundation. Among others, the study discovered that the establishment and growth of illegal refineries in Nigeria is at exponential rate. As a recommendation, the study suggested internal official scrutiny of Nigeria security agencies and oil institutions against official sabotage in the oil sector.

Keywords: Oil, Theft, Ocean, Pollution, Nigeria.



CORPORATE SOCIAL RESPONSIBILITY IN NIGERIA'S MARITIME SECTOR: FOSTERING SUSTAINABLE GROWTH AND IMPACT

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Abstract

This paper investigates the function of corporate social responsibility (CSR) in Nigeria's maritime sector using Stakeholder Theory and Legitimacy Theory. It looks at how CSR projects propel sustainable development, lower social and environmental hazards, and improve organizational legitimacy in an industry vital to Nigeria's economy if properly carried out. Using case studies and sector-specific challenges, the paper offers practical suggestions for matching CSR initiatives with stakeholder expectations and societal demands while enabling significant industry benefits.

Keywords: Corporate Social Responsibility; Stakeholder Theory; Legitimacy Theory; Sustainable Development; Nigerian Maritime Sector; Environmental Stewardship

HERBERT PAUL GRICE'S CONVERSATIONAL COMPETENCE AND STRESS MANAGEMENT IN MARITIME BUSINESS ADMINISTRATION

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Abstract

The rate of productivity of every organization is, majorly, dependent on the mental health of the workers and the synergy that exists between the executives and the subordinates. The workforce of organizations is made up of a community that may be homogenous or heterogenous. In maritime



business, the community is complex as different people from different ethnic groups and nations converge to do businesses. The arms of the organization are also numerous to cater for the different demands of the business. The peculiarity of the business also necessitates a longer input of time, energy and resources unlike those of regular businesses. For these reasons, the rate of stress experienced by the workers is higher than normal and needs special management. This paper undertakes a discourse analysis of Paul Grice's conversational maxims to unfold how the application of the quantity (informativeness), the quality (truthfulness), the manner (clearness) and relevance of conversations among the management and staff can control the stress level in the organization and lead to maximum productivity. The findings show that people tend to be highly motivated, happy, obedient, respectful, and cooperative and less stressed when conversational maxims are employed judiciously by their boss and colleagues. It then recommends that the management of Maritime businesses need to integrate Grice's conversational maxims among the list of courses to be taught to their staff during orientations and workshops, basically, for stress control and better output.

MANAGEMENT OF MARITIME NAVIGATIONAL AIDS FOR SAFE PASSAGE OF SHIPS ON OCEAN/COASTAL WATERS IN NIGERIA .

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Abstract

Effective maritime management of navigational aids is crucial for ensuring the safe passage of ships through ocean and coastal waters in Nigeria. This research investigates the current state of navigational aid management, identifying challenges, gaps, and areas for improvement. A comprehensive analysis of international regulations, national regulations, national policies, and industry best practices is conducted, supplemented by empirical data from navigational operators, ship owners and maritime authorities. The study develops a framework for optimal navigational aid management, incorporating advanced technologies, risk-based approaches and collaborative stakeholder engagement. The findings and recommendations of this research will contribute to enhancing maritime safety, efficiency, and sustainability, ultimately reducing risk of navigational accidents and promoting secure passage of ships through the Nigeria oceans and coastal waters.

Keywords: Maritime, Management, Navigation, Safety, Ship and Ocean.



ECO-FRIENDLY MARINE RECREATION: A NEW TREND IN TOURISM AND HOSPITALITY MANAGEMENT IN NIGERIA.

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Abstract

Eco-friendly marine recreation is emerging as a transformative trend in tourism and hospitality management, driven by increasing environmental awareness and a growing demand for sustainable travel experiences. This article explores the rise of eco-friendly marine recreation, examining its impact on tourism development and environmental conservation. By promoting activities such as kayaking, snorkeling, and wildlife observation with minimal ecological footprints, eco-friendly marine recreation supports sustainable tourism while enhancing visitor experiences. This study utilizes a comprehensive literature review and case studies to analyze the economic, social, and environmental benefits of eco-friendly marine recreation. The findings reveal that incorporating sustainable practices not only attracts environmentally conscious travelers but also fosters marine conservation and community development. Challenges such as inadequate infrastructure, regulatory gaps, and stakeholder resistance are identified, alongside opportunities for growth through technological innovations and community-based tourism initiatives. The paper concludes by recommending strategic frameworks and policies to promote eco-friendly marine recreation as a sustainable tourism model, ensuring economic viability and environmental stewardship in the tourism and hospitality industry.

Keywords: Eco-Friendly Marine Recreation, Sustainable Tourism, Marine Conservation, Tourism and Hospitality Management, Nigeria.



PLASTIC POLLUTION AND HUMAN HEALTH IN NIGERIA: AN ANALYSIS OF EXPOSURE PATHWAYS AND HEALTH RISKS

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Abstract

Plastic pollution has become a pervasive environmental issue in Nigeria, with far-reaching consequences for human health. This study investigates the relationship between plastic pollution and human health in Nigeria, with a focus on exposure pathways and health risks. A mixed-methods approach was employed, combining field observations, laboratory analysis, and surveys to gather data on plastic pollution in Nigerian environments. The results show that plastic pollution in Nigeria is widespread, with plastics contaminating water, air, and food. Exposure pathways include ingestion of microplastics through seafood consumption, inhalation of microplastics through airborne particles, and dermal exposure through contact with contaminated water and soil. The health risks associated with plastic pollution in Nigeria include increased risk of cancer, reproductive problems, and respiratory diseases. The study recommends policies and interventions to reduce plastic pollution in Nigeria, including extended producer responsibility, waste management infrastructure development, and public education campaigns. This research contributes to the growing body of evidence on the human health impacts of plastic pollution and highlights the need for urgent action to address this critical environmental health issue in Nigeria.

Keywords: Plastic pollution, human health, exposure pathways, health risks, Nigeria, environmental health.



MARITIME POLLUTION MITIGATION: TECHNIQUES FOR LONG-TERM ECONOMIC DEVELOPMENT

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Abstract

The study examined Maritime Pollution Mitigation: Techniques for Long-Term Economic Development. The study specifically examined the primary sources and impacts of maritime pollution on the environment and economy, existing maritime pollution mitigation strategies and their effectiveness, explored innovative and sustainable technologies that can reduce maritime pollution while fostering economic development and provided policy recommendations for stakeholders to promote eco-friendly maritime operations without compromising economic growth. The study adopted a qualitative research approach, involving a comprehensive review of existing literature, case studies, and policy analysis. The study were analysed using Pearson correlation, result of the analysis revealed that major pollutants, including oil spills, ballast water discharge, greenhouse gas emissions, and plastic waste, significantly affecting marine ecosystems. It was also observed that measures, such as the use of cleaner fuels, ballast water treatment systems, and strict regulatory frameworks, have shown varying degrees of success in controlling pollution. The study recommended among others that Governments and international organizations should enhance existing regulations and ensure strict enforcement to minimize maritime pollution.

Keywords: International Maritime Organization, Maritime pollution, oil spills, plastic waste, ecosystems.



**EXPLORING THE CRITICAL NEXUS IN INFORMAL CROSS-BORDER TRADE
BETWEEN NIGERIA AND CAMEROON: IMPLICATIONS FOR POLICY REFORM
IN NIGERIA**

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Abstract

The environment of restrictive trade policies, high tariffs, and inadequate infrastructure often give rise to informal cross-border trade (ICBT) with a corresponding loss of revenue for governments and potential economic instability. However, ICBT has remained a potential source of employment, economic well-being and livelihood for many people. This study examines the critical nexus underlying ICBT, with a focus on the implications for policy reform. Three objectives and three research questions were proposed and answered respectively in this study. Data was generated from 269 respondents, comprising of traders and boat owners using a researcher developed questionnaire titled 'Cross-Border Trade Assessment Questionnaire' (CBTAQ). Using descriptive statistics with qualitative insights from case studies, the researcher identified key products such as fuel, electronics, cosmetics, beverages, rice, vegetables, fairly used clothes and shoes among others as key traded products in ICBT between Nigeria and Cameroon. Again, findings revealed an estimated trade value of not less than 700million Naira per month. Result also revealed that simplifying trade regimes and reducing barriers can encourage informal traders to formalize their operations. Based on the findings of this study, the researcher concluded that formalizing commercial links and trade between Nigeria and Cameroon will be of benefits in terms of generation of substantial revenue and employment opportunities in the border areas and beyond. Consequently, the researcher recommended the need for a comprehensive policy reform agenda that addresses the root causes of ICBT, promotes trade facilitation, and enhances access to finance for small-scale traders.

Keywords: Informal cross-border trade, trade policy, traded products, economic sustenance, Nigeria and Cameroon.



**THE IMPACT OF LANGUAGE DIVERSITY ON SEAFARERS' PRODUCTIVITY IN
THE NIGERIA MARITIME INDUSTRY**

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Abstract

Seafarers all over the world are charged with arrays of responsibilities from cargo handling, maintenance, navigation, safety procedures and emergency response. They are to ensure that all operations comply with international maritime laws, environmental standard and they play critical role in the global supply chain. However, diversity in language most time appear to create interference in productivity of the seafarers as they tour around diverse regions, countries, and languages. This study was set out investigate the impact of difference in languages among seafarers on their productivity in the area of sea safety and supply chain maintenance. The study Adapted a descriptive research design and selected total of two hundred respondents involved in seafaring sampled across the seaports in Nigeria using multi-staged sampling technique involving both quota, stratified and systematic random sampling. Results from the use of multiple regression analysis show that language barriers play positive and significant impact on the productivity of seafarer. The implication of this is that if difficulties in languages should continue to restrain free interaction among the seafarers, achieving sustainability in global supply chain will remain a tall dream that will hinder achievement of some sustainable development goals. The study findings therefore suggest that since seafaring must involve diverse countries, establishment, teaching and conservation of seafaring languages will go a long way.

Keywords: Language diversity, Seafarer, Maritime, Productivity, seaports, Nigeria.



**EFFECT OF CORPORATE SOCIAL RESPONSIBILITY ON THE GROWTH OF
MARITIME INDUSTRY IN PORT HARCOURT RIVERS STATE**

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Abstract

This study focuses on the effects of corporate social responsibility on the growth of maritime business in Port Harcourt metropolis. It specifically investigates the effect of community engagement, employee welfare and customer satisfaction. A quantitative research design was adopted by taking cognizance of five maritime companies in Port Harcourt . A convenience sampling procedure was used as a means for data collection to establish whether corporate social responsibility has a significant relationship with the growth of maritime industry in Port Harcourt , Rivers State. A total of two hundred questionnaires were distributed and filled by the target respondents. Chi-square method was employed to analyse the data. Result showed that good community engagement and relationship, employee welfare and customer satisfaction were found to have valuable positive effect on the growth of maritime Business in Port Harcourt metropolis. Corporate social responsibility play a crucial role in improving the operational performance of the industries through building goodwill with the community. Therefore, maritime industries should have a holistic review of community development, providing schools and basic infrastructural and social Amenities, Staff Motivation and to Improve on Customer Service.

Keywords: Corporate Social Responsibility; Community engagement; Employee Welfare; Customer Satisfaction; Maritime Industry



EFFECT OF SURVIVAL STRATEGIES ON PERFORMANCE OF SMALL MEDIUM ENTERPRISE IN SOUTH-EAST NIGERIA: MEDIATING ROLE OF MARKETING PRINCIPLES.

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Abstract

The study examined the effect of survival strategies on performance of small medium enterprise in South-East Nigeria. Specifically, the study sought to: examine the effect of product quality strategy on competitive advantage of small medium enterprise in South-East Nigeria and identify the effect of Service delivery strategy on large market-share of small medium enterprise in South-East Nigeria. Research design was descriptive survey research method. Study Area was South East, Nigeria. The sample size 388 respondent was drawn from population that comprises of 645 registered SMEs in South-East Nigeria with 13,455 total numbers of staff. The study used structured questionnaire to obtain data. Research questions were answered using mean score and standard deviation. The hypotheses stated were tested using simple regression techniques. The empirical results show that product quality strategy has significant effect competitive advantage of small medium enterprise in South-East Nigeria (t-statistic; 6.445; P-value; 0.000 < Sig-value; 0.05) and service delivery strategy has significant effect performance of small medium enterprise in South-East Nigeria (t-statistic; 11.226; P-value; 0.000 < Sig-value; 0.05). The study recommended that SMEs operators in South East Nigeria should further device effective marketing strategies such as branding strategy and creative personal selling which will sustain and further enhance smooth and profitable business operations. This will in the long-run increase their employment creation of SMEs in South East Nigeria.

Keywords: Survival strategies; Product quality strategy; Service delivery strategy; SMEs



**CONFLICT MANAGEMENT STRATEGIES AND EMPLOYEE PERFORMANCE IN
DEPOSIT MONEY BANKS IN NIGERIA**

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Abstract

The study examined conflict management strategies and employee performance of deposit money banks in Nigeria. Specifically, the study sought to: find out the effect of collaboration on employee effectiveness of deposit money banks in Nigeria and evaluate the influence of avoidance on employee attitude of deposit money banks in Nigeria. The study employed descriptive survey design. The selected deposit money banks were Zenith Bank, First Bank, Union Bank and Fidelity Bank. The sample size of 249 respondents was drawn from population of 802 permanent staff of deposit money in Nigeria. The main instrument for data collection was a structured questionnaire. The hypotheses stated were tested using single regression techniques. The empirical results show that collaboration has significant effect on employee effectiveness of deposit money banks in Nigeria (t – statistics (8.887) > P – value (0.000) and avoidance has significant influence on employee attitude of deposit money banks in Nigeria (t – statistics (8.111) > P – value (0.000). the study recommended that management of deposit money banks in Nigeria should embark on training and retraining of its employees in area of conflict management so as to create a conducive working environment for the employees and that there should be efficient and effective communication between and among all categories of the employees the organisation. This will reduce conflicting situations in the organisation.

Keywords: Conflict management strategies; Collaboration strategy Avoidance strategy and employee performance



LEGISLATIVE AND INSTITUTIONAL FRAMEWORK FOR OCEAN GOVERNANCE IN NIGERIA

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Abstract

Oceans are essential for the health of the nation, food, global trade, and international security. Human ocean interactions are now rapidly developed and faster than in history, and as such calls for greater precaution. Indeed there is high and imminent need to start navigating the future, by anchoring sustainability while bridging the gap between economic growth and Marine preservation. Ocean state has worsened with oil pollution being one of the greatest threats in Nigeria. The oceans are at risk and present a threat to life. Effective ocean governance is imperative as it aims to consciously transform human ocean interactions towards sustainability. Problems in ocean resource management derive from governance, not science. Ocean governance in Nigeria has to deal with legions of laws and institutional mismatches with over lapping jurisdictions and trans-boundary issues. The aim of this study is to contend that oceans are not subject to too little laws or an absence of science but rather to too little effective governance that can respond to the increasing challenges in the oceans while navigating to the future. The process of ocean governance should be integrated horizontally and vertically because it requires the participation of governmental institutions, the private sector, NGOs, academics, scientists, etc. across all of levels of governance. The study further recommends reviewing the Ocean Governance related Acts, adequately funding maritime enforcement agencies, strengthening the judiciary, reforming the criminal justice system, prosecuting piracy enablers cum beneficiaries, and cultivating the political will to curb sea robbery and piracy by the Nigerian government. Some of these measures will ensure effectively Ocean Governance in Nigeria.

Keywords: Maritime, Ocean Governance, Regulation, Sustainability, Blue-Economy



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EXPLORING THE TOURISM POTENTIALS IN MARITIME INDUSTRY FOR NATIONAL DEVELOPMENT

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Abstract

The paper aims at exploring the tourism potentials in maritime industry in Nigeria. The nation is richly endowed with numerous tourism potentials which includes rich cultural heritage, artefacts, monuments, and museums. Additional to these great tourism opportunities in the nation are large water bodies which can serve as tourism outlets for national development. So far, the potentials in maritime industry have not been maximized as it ought to. This paper will delve into exploring the types, advantages and potentials in maritime industry in the Nigeria. Result shows that maritime industry has vast benefits and is a new wave of tourism business capable of boosting the economic status of the nation if maximized. The paper discovered that maritime is a world of its own, a whole new and refreshing experience to explore by tourists. The world of water resources has vast engagements in commercial activities – yachting, cruising, travel, restaurants, hotels, accommodations, recreation and sightseeing. The paper recommends government, individual and nongovernmental organizations to support the maritime industry for sustainable development in the country.

Keywords: maritime industry, tourism potentials, Nigeria, national development



**AUDIENCE PERCEPTION OF MEDIA COVERAGE OF THE 2023 FUEL SUBSIDY
REMOVAL IN SOUTH-EAST NIGERIA**

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Abstract

This study, is an audience perception of media coverage of the 2023 fuel subsidy removal in south-east Nigeria. It was anchored on Cultivation theory, Freedom theory, social responsibility theory. Focusing Southeast Nigeria Residents, the study adopted survey research design. The population of this study was derived, using Australian online calculator to determine the sample size of 385 used for this study. The researcher adopted sampling technique to draw a definite and manageable sample of respondents that adequately represented the entire population of the study. Five states were purposely selected for the study. Each selected state was clustered according to senatorial districts, random sampling technique was used to select one senatorial district per state. One Local Government Area (LGA) from each of the senatorial districts were randomly selected. Finally, one town from each LGA. Copies of questionnaires administered respondents drawn from the areas. Findings from the study revealed that, the audience perception of the media coverage about the 2023 fuel subsidy removal in south-east Nigeria was high, because, cut across every part of their business that affected negatively, this, made it to become an uphill task for them to rely on the information coming their way from the media, that serves as part of hope of the citizens.

Keywords: Audience, Media, Perception, Fuel subsidy and the South-East.



**CHEMICAL POLLUTION OF MARINE ENVIRONMENT AND BLUE ECONOMY
CHALLENGES IN NIGERIA**

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Abstract

This paper presents the effects of chemical pollution on the marine environment and the challenges of the blue economy in Nigeria. The study aims to assess the effect of oil spillage and gas flaring in Nigerian oceans. Analytical research was used to express marine animals' challenges due to chemical pollution. Chemical discharge attitudes in the high sea, Warri, and Port Harcourt harbor were used as reference points to buttress the pollution sources. These sources were outlined and their impacts on aquatic life were discussed. Sources such as proliferation, intentional release of chemicals into the ocean, maintenance of vessels by the crew, accidental discharge, and other human activities were analyzed. The results of chemical discharge from these sources on marine animals were explained. It's consequences on blue economy sustainability were analyzed. It was recommended that the Carbon Trade and Polluter Pay Principle be adopted to compensate less polluters. The study concludes by highlighting the economic importance of the blue economy that houses marine life.

Keywords: Chemical Pollution, Blue Economy, Ecosystem, Marine Animals, Sustainability

**.SUSTAINING EDUCATION IN NIGERIA THROUGH MARITIME
ARCHAEOLOGICAL OBJECT-BASED LEARNING IN MUSEUM**

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Abstract

The study focuses on bolstering education in Nigeria by using museum objects from maritime archaeology as instructional materials. It investigated museum education from the perspective of object-based learning which encourages participants to construct meaning by interacting with museum objects. Data for the study were sourced through secondary sources such as books, journals and public library, and were analyzed thematically. Findings show that object-based learning is



relevant to tourists who visits museums as it provide them with experiential learning where the cumulative effect of the experiences contributes to their social and cognitive development, enhances their interpersonal interactions, and plays vital role in the development of children's higher mental functions. Object-based learning presents opportunity for strengthening family ties, and for social interactions, and can stimulate exchange of information and reactions among members of a family group. Findings also show that adult visitors to museums are likely to construct personal meanings from what they see and as they interact with museum objects since they may have prior understanding about museum, thus, museum professionals can use front-end research to uncover these meanings. To guide visitors' learning in museum and to improve museum educational services, it is suggested that museums should develop educational policies and apply educational theory through specific pedagogy.

Keywords: Maritime Archaeology, Museum, Object-based learning, sustainable education, Nigeria

CONTEXTUALISING QUEER IDENTITY AND POLLUTION OF NIGERIA'S SOCIAL ORDER IN SELECTED #ENDSARS PLACARDS

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Abstract

The #EndSARS protest space offered a foci of interests that seemed contradictory to Nigeria's multicultural social order. A profound representation of anathema is the queer identity of some youth protesters in the #EndSARS protest which the present study perceives as a form of social pollution. Using the 1999 Constitution, the 2014 Same Sex Act, Cultural Discourse Study and Kress and van Leeuwen's visual grammar, this study reviews the dynamics of same-sex relationships in selected cultures in Nigeria in contrast to its representations in the placards used in the #EndSARS protest, and the identity crises embodied. It argues that the #EndSARS protest placards served as media for polluting Nigeria's social order. The study advocates that while the fundamental rights of Nigerians should be respected, such freedom should not be stretched to encroach on the social sanctity of the multicultural societies that form the amalgamated Nigeria.

Keywords: Nigeria's multiculturalism, Nigeria's social order, same-sex dynamics, identity crises, social semiotics, the 1999 Constitution, 2014 Same Sex Act, cultural semiotics and visual grammar



ECOTOURISM EXPLORATION IN MARITIME SECTOR OF NIGERIA

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Abstract

Nigeria is blessed with about 46, 500km² maritime area, which positions it advantageously for maritime operations in West Africa, invariably controlling over 80% of the maritime activity on the West African axis, and seemingly dominating the business and its allied services in the region. Moreover, the sector is projected to have an annual value of about 7 trillion naira. Conversely, the coastal region of Nigeria offers opportunities for other economic activities via ecotourism which relies on natural resources (i.e. coastal areas). The ecotourism market worth as of 2023 was US\$216.49 billion, and it is projected to grow from US\$260.76 billion worth in 2024 to US\$759.93 billion by 2032. Moreover, it is propagated due to its inherent sustainable use of the environment, and the potential to attract funds for conserving the environment, generate funds, and create employment, especially for host communities. Therefore, the study explores the gains and pitfalls of exploring ecotourism in Nigeria's marine area through qualitative means; different states within Nigeria's maritime zones will be sampled. The study seems imperative as the world has become environmentally conscious, needs to end poverty through job creation, and seeks an ideal path for sustainable use of the environment. The study will add value to the development and preservation of coastal biodiversity for other options like ecotourism, which may have been affected by different uses of the maritime zones or add more value to existing uses. The implications of this study to policymakers in maritime, tourism and other relevant stakeholders cannot be overemphasized.

Keyword: Africa, Ecotourism, Environment, Maritime & Nigeria.



NUMERICAL AND GEOMORPHOLOGICAL CHARACTERIZATION OF WAVE DYNAMICS EFFECTS ON THE MECHANISMS OF SEDIMENTATIONS AT SOME VULNERABLE UNITS IN NIGERIA COASTS

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Abstract

Ocean wave-dynamics and other drivers of compound flooding have continued to counter the coastal static equilibrium by their transitory effects at the Nigerian shoreline. Related literatures have no work conducted on wave-drivers as pre-condition in the assessments of these geo-hazards. The aim of the study is to characterize wave dynamic effects on directedness of sediments in Nigerian coast. The lithology units are the coastal floodplain of the west and the continental sands from Lagos to Calabar. This work adopted experimental design and Artificial Neural Networks (ANN) modeling. The wave energy ranged from 98 (J) to 1.744 (KJ). (ANN) determined thermohaline mixing régime (Ri) for Lagos, Brass and Oron as (R1) 1-50(m), (R2) 150-350(m), (R3) 350-1200(m) for epilimnion, metalimnion, and hypolimnion respectively. Cohesion (c), friction angle (ϕ), liquid limit (LL), plastic limit (PL) and Plasticity index (PI) also ranged from (8.1-38 KPa), (19- 32°), (33-230%), (21.2-44.0%) to (9.6-51.0%), respectively.

Keywords: Wave-dynamics, Geo-hazards, Sediments, ANN-modeling &, Thermohaline

COASTAL DEVELOPMENT AND THE IMPACT OF CLIMATE CHANGE ON THE MARINE ECOSYSTEM IN NIGERIA

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Abstract:

The rapid growth of coastal development in Nigeria due to industrialization & its economic activities has improved the economic situation in Nigeria. They provide an area for more job opportunities, relaxation and recreation. In as much as these new developments have improved the country's economic growth and facilitated International Trade, the challenges caused by these coastal developments still raise serious ethical questions. Changes in the climate causes ocean



acidification, global warming, coastal erosion, destruction of habitats, species migration & rising sea levels which severely endangers the marine ecosystems and affects sources of income for most coastal communities. Changes occurring in the climate are imminent, but the negative effect & damage to marine organisms and its habitat can be greatly reduced by reducing the effects of greenhouse gas emissions. In this study, we focus the impact of human activities and climate change on the marine life in Nigeria with the aim of preserving biodiversity, fish communities and ensuring effective management of coastal development. We will explore different policies that will help conserve the marine ecosystems like the establishment of Marine Protected Areas & sustainable fishing practices which are crucial in protecting marine biodiversity and the ecosystem. Our end goal is to protect the marine habitat and its organisms, ensure sustainable growth of the economy with coastal conservation while still ensuring marine species survivability.

Keywords: coastal development, climate change, marine ecosystem, ocean acidification, sea level rise.

THE IMPACT OF SOCIO-ECONOMIC CHARACTERISTICS ON MARITIME TOURISM DEVELOPMENT IN NIGERIA.

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Abstract

This study aimed to investigate the influence of Nigerians' socio-economic characteristics on the maritime tourism development in sector. A cross-sectional research design was adopted, with a population sample of 39,085,106, determined using the Taro Yamane formula. A sample size of 400 was selected, and 400 questionnaires were administered, with 372 returned and used for analysis. Descriptive statistics were employed for the research questions, while Linear Regression in the Statistical Package for Social Sciences (SPSS) version 22 was used to test hypotheses one to five. The findings indicated that the socio-economic characteristics significantly impact the sector, leading to a low level of patronage. The study concluded that the coastal states possess a variety of landscapes with rich maritime tradition and heritage, making maritime tourism a vital sector that requires immediate attention for increased government revenue, investment opportunities, and employment generation. Recommendations includes; enhancing the status of maritime tourism



facilities is essential to align the Nigerian tourism industry with international regulations and best practices, thereby facilitating its growth and development, maritime tourism industry requires increased publicity and awareness campaigns to showcase its benefits, opportunities, and potentials effectively and making aggressive marketing strategy is necessary to unlock the full potential for growth in maritime tourism. Keywords: Passenger, Tourism, Maritime, Water Transport, Infrastructure, Socio-economic.

THE EFFECT OF INFRASTRUCTURE ON MARITIME TOURISM DEVELOPMENT IN NIGERIA

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Abstract

This study aimed at examining the impact of infrastructure on maritime tourism development and the influence of Nigerians' socio-economic characteristics on the sector. A cross-sectional research design was adopted, with a population sample of 39,085,106, determined using the Taro Yamane formula. A sample size of 400 was selected, and 400 questionnaires were administered, with 372 returned and used for analysis. Descriptive statistics were employed for the research questions, while Linear Regression in the Statistical Package for Social Sciences (SPSS) version 22 was used to test hypotheses one to five. The findings indicated that the status of infrastructure significantly affects tourism development in Nigeria. Despite the abundant resources in its seas and oceans for development and economic diversification, Nigeria has not fully leveraged maritime tourism for its economic growth. Maritime infrastructure, including distance, security, availability of extra income, good road network, and ports and facilities for embarking and landing passengers, is crucial for tourism growth and development. Infrastructure plays a pivotal role in the transport chain, connecting the sea to other modes of transport such as road, rail, air, and pedestrian routes. Additionally, socio-economic characteristics significantly impact the sector, leading to a low level of patronage. The study concluded that the coastal states possess a variety of landscapes with rich maritime tradition and heritage, making maritime tourism a vital sector that requires immediate attention for increased government revenue, investment opportunities, and employment generation. Recommendations include focusing on infrastructure improvement and enhancing security conditions at tourist sites in line with international regulations and best practices. Furthermore, advocacy and strategic enlightenment campaigns should be conducted to showcase the sector's benefits and potentials.

Keywords: Passenger, Tourism, Maritime, Water Transport, Infrastructure, Socio-economic.



**COMPARATIVE ANALYSIS OF THE IMPACT OF SINGLE WINDOW
IMPLEMENTATION ON TRADE EFFICIENCY: A CASE STUDY OF THE PORT OF
LOMÉ AND MAJOR NIGERIAN SEAPORTS**

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Abstract

The implementation of Single Window Systems in port operations aims to enhance port efficiency by streamlining customs procedures, reducing clearance time, and minimizing trade barriers. This study conducted a comprehensive analysis of the impact of single window implementation at the port of Lomé and major Nigerian seaports focusing on trade facilitation, cargo throughput and port competitiveness, with specific objectives, to assess the impact of single window implementation on cargo clearance time and overall port efficiency at the port of Lomé and major Nigerian seaports, and to compare the effectiveness of Togo's Single Window policy and Nigeria's National Single Window in improving customs procedures, reducing trade cost, and enhancing port competitiveness. Using an empirical approach, the study collects and analyzes secondary data from port authorities and online journal publication, custom records, and international trade report. Key performance indicators such as cargo clearance time, dwell time, custom revenue, and trade volume are examined to determine the effectiveness of Togo's Single Window Policy versus Nigeria's National Single Window System. The findings reveals that the port of Lomé with a fully operational and integrated single window, demonstrate higher efficiency in cargo handling and custom clearance, contributing to its rising role as a regional transshipment hub. Conversely, Nigerian seaports, despite implementing the National Single Window, continue to experience bureaucratic delays, infrastructural bottleneck, and policy inconsistencies, limiting its full potential. The study highlighted best practices from Togo's model that could enhance Nigerian port efficiency. The efficiency provide policy recommendation for optimizing trade facilitation through improved digital integration, inter-agency collaboration, and regulatory reforms in Nigeria's ports system. This research contributes to the discourse on trade competitiveness in West Africa and offers insights for policy makers and port stakeholders seeking to maximize the benefits of Single Window Systems.

Keywords: Single Window System, Trade Efficiency, Cargo Throughput, Port Competiveness, Customs Clearance

