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CHALLENGES AND OPPORTUNITIES OF MARITIME BUSINESS AND ENTREPRENEURSHIP FOR SUSTAINABLE DEVELOPMENT

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Abstract
This study examined the trends, challenges, and opportunities of maritime business and entrepreneurship for sustainable development. Using a survey research design, data were collected from 91 educators in Business Education and Entrepreneurship Programmes across 4 selected tertiary institutions in Delta and Rivers State of Nigeria. Purposive sampling technique was used to sample the 91 participants in this study self-constructed questionnaire was the instrument for data collection, which was validated by three experts and it yielded a reliability coefficient score of 0.78. Statistics such as mean, standard deviation and ANOVA were used to analyze the study's data. Results of the study revealed key trends in the maritime sector such as the adoption of digital technologies, increasing demand for environmentally sustainable shipping practices, and the growth of diversified maritime-related services. Results further revealed that the sector faces challenges such as regulatory bottlenecks, insufficient funding for entrepreneurial ventures, and limited integration of sustainability-focused curricula in education. Despite these challenges, significant opportunities were identified, such as expanding blue shipping enterprises, fostering public-private partnerships, and enhancing entrepreneurship education tailored to maritime innovation. The study concludes that while the maritime industry in Nigeria is poised for growth, leveraging its full potential for sustainable development requires overcoming regulatory and infrastructural constraints and improving entrepreneurial capacity. The study recommends regulatory policy reforms to foster investment in sustainable maritime ventures in Nigeria. Also, government at all levels should establish financial incentives and grants to support blue maritime businesses and entrepreneurship training.

Keywords: Maritime business; entrepreneurship; business education programme; sustainable development in maritime industry; maritime technology and innovation; blue economy

Introduction

The maritime business has long been a cornerstone of global trade and economic development, facilitating the movement of goods, people, and resources across the world. Maritime business encompasses a wide range of activities, including shipping, logistics, port operations, shipbuilding, and offshore energy exploration (Katuwawala & Bandara, 2022). Over the years, advancements in technology, globalization, and evolving consumer demands have significantly reshaped the maritime sector, creating both opportunities and challenges. These developments according to Santos (2021) have spurred the need for innovative approaches to enhance operational efficiency, reduce costs, and address environmental concerns. As the industry continues to evolve, maritime businesses are increasingly focusing on sustainability and innovation to remain competitive in a dynamic global market.

Entrepreneurship within the maritime industry is emerging as a key driver of innovation and sustainability, offering solutions to many of the sector's pressing issues. Entrepreneurs are leveraging cutting-edge technologies, such as the adoption of digital technologies, automation, and blue shipping initiatives, which are reshaping the landscape of maritime business. However, alongside these advancements, studies such as Nathan (2017) and Echera (2018) have stated that maritime entrepreneurs often encounter challenges such as high capital requirements, regulatory complexities, and limited access to specialized knowledge and networks. Despite these challenges, fostering a culture of entrepreneurship in the maritime sector is essential for driving innovation and ensuring the industry's long-term sustainability (Raheem, 2022). As a result, entrepreneurs are forming partnerships with research institutions, government agencies, and industry stakeholders to accelerate the adoption of sustainable practices and innovative solutions.

Sustainability has become a central focus for maritime business and entrepreneurship as stakeholders recognize the need to balance economic growth with environmental stewardship (Michalska-Szajer, Klimek & Dąbrowski, 2021). The adoption of sustainable practices, such as the use of alternative fuels, energy-efficient technologies, and circular economy principles, is increasingly being prioritized (Del Giudice, Di Vaio, Hassan & Palladino, 2022). However, implementing these practices on a large scale remains a daunting task, particularly for smaller maritime businesses with limited resources (Ahmad, Othman, Saadon & Nor, 2020). Collaborative efforts between governments, industry leaders, and researchers in educational institutions are essential to overcome these challenges and accelerate the transition to sustainability. By fostering a conducive environment for maritime entrepreneurship, the maritime industry can tap into new opportunities and drive progress towards a more sustainable future (Desa, 2016).

The maritime business and entrepreneurship role in achieving sustainable development extends beyond economic considerations to include social and environmental

dimensions. Ports and shipping companies have a significant impact on coastal communities, influencing employment, infrastructure development, and environmental health (Philipp, Prause & Gerlitz, 2019; Smith-Godfrey, 2016). Initiatives that integrate corporate social responsibility, community engagement, and innovative business models may play a pivotal role in achieving these objectives. This study examined the emerging trends, persistent challenges, and untapped opportunities within the maritime industry to provide insights into its role in sustainable development. By analyzing current practices, innovative solutions, and policy frameworks, the study seeks to identify pathways for enhancing the maritime sector's sustainability and competitiveness.

Statement of the Problem

Maritime business and entrepreneurship, integral to global trade and economic stability, is currently undergoing profound transformations influenced by technological advancements, environmental imperatives, and evolving market dynamics. Despite its critical role in fostering connectivity and economic growth, maritime businesses face significant challenges in aligning operations with sustainable development goals (Primachev & Primacheva, 2017). Emerging trends such as digitalization and the adoption of automation tend to present opportunities for innovation but also create barriers for smaller maritime businesses and entrepreneurs. Smaller maritime businesses and entrepreneurs, which constitute a significant portion of the maritime industry, frequently lack the resources to invest in sustainable technologies and practices. Maritime entrepreneurs face systemic barriers, including high capital requirements, regulatory constraints, and limited access to industry-specific knowledge and networks (Oluwagbenga, Bello & Owoputi, 2021). The absence of robust incentives and support systems exacerbates these issues mentioned.

While some maritime ventures have successfully leveraged technology to address inefficiencies and environmental concerns, the scalability of such solutions tend to be a significant hurdle. Such maritime businesses and entrepreneurs often prioritizes short-term profitability over long-term sustainability, further complicating efforts to align with sustainable development goals. Additionally, the fragmented nature of the maritime industry complicates the establishment of cohesive strategies to support entrepreneurial efforts (Choi, Kelley, Murphy & Thangamani, 2016). This misalignment raises critical questions about the mechanisms needed to foster a thriving maritime business and entrepreneurial ecosystem that can address the maritime sector's sustainability and innovation challenges. Hence, there is the need for a comprehensive examination of how maritime business and entrepreneurship can navigate these trends and challenges to contribute meaningfully to global sustainability.

Research Questions

The following research questions were raised to guide the study:

1. What are the challenges of maritime business and entrepreneurship in South-South region of Nigeria?
2. What are the opportunities of maritime business and entrepreneurship for sustainable development in South-South region of Nigeria?

Purpose of Study

This study assessed the trends, challenges, and opportunities in maritime business and entrepreneurship for sustainable development. However, the specific objectives include:

1. to assess the challenges of maritime business and entrepreneurship in South-South region of Nigeria.
2. to determine the opportunities of maritime business and entrepreneurship for sustainable development in South-South region of Nigeria.

Literature Review

According to a study by Kyvelou and Ierapetritis (2019), maritime business refers to the collection of economic activities and operations associated with the transportation of goods and people, resource extraction, and the provision of services related to oceans, seas, and inland waterways. At its core, maritime business involves the facilitation of global trade through shipping and logistics, making it a cornerstone of international commerce (Kontakos, 2019). According to Smith-Godfrey (2016) the sector also extends to ancillary industries such as shipbuilding, port management, offshore energy, and marine tourism, which collectively contribute to economic development. Over time, maritime business has evolved in response to technological advancements, regulatory changes, and shifting market dynamics, making it a highly adaptive and strategic field. Maritime entrepreneurship has emerged as a critical force within this complex maritime industry. According to Echera (2018) maritime entrepreneurship is the process of identifying, developing, and implementing innovative business solutions and ventures within the maritime sector to address existing challenges and capitalize on emerging opportunities. It involves leveraging creativity, technology, and market insights to create value in areas such as shipping efficiency, sustainable resource utilization, and enhanced supply chain management.

While maritime business serves as the backbone of international trade and commerce, maritime entrepreneurship tend to drive the transformative changes needed to address contemporary challenges. The conceptual foundation of maritime business and entrepreneurship is deeply intertwined with the principles of the blue economy, which emphasizes the sustainable use of ocean resources for economic growth, environmental health, and social equity (Winther, Dai, Rist, Hoel, Li, Trice & Whitehouse, 2020). This

framework according to Raheem (2022) encourages maritime businesses and entrepreneurs to adopt practices that balance profitability with environmental stewardship and community well-being. For example, the shift toward green shipping technologies, such as low-emission fuels and energy-efficient vessels, reflects the integration of blue economy principles into maritime entrepreneurship. Additionally, initiatives such as marine spatial planning and ecosystem-based management provide a roadmap for aligning business operations with the sustainable development of marine resources.

The concept of sustainable development is one of the most widely used concepts in recent years. The concept of sustainable development is a subject that has been researched by many disciplines including the maritime industry. Sustainable development in the maritime industry refers to the strategic approach of balancing economic growth, environmental preservation, and social well-being in maritime operations and activities (Eneji, Nnandy, Gukat & Odey, 2018; Primachev & Primacheva, 2017). It emphasizes the responsible use of ocean resources to ensure the long-term viability of the industry while minimizing its environmental footprint. Coastal and island communities often depend on maritime activities for their livelihoods, making it essential to ensure that these communities benefit equitably from the growth of maritime business and entrepreneurship. This according to Katuwawala and Bandara (2022) includes providing access to education and training programs, promoting gender equality in maritime professions, and supporting small-scale fisheries and local enterprises. By aligning business strategies with these principles, the maritime industry can achieve growth that is not only profitable but also environmentally and socially responsible.

The theoretical framework for this study was based on the Blue Economy Framework that was popularized by Gunter Pauli in 2010 through his book titled 'the Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs.' The Blue Economy Framework emphasizes the sustainable use of ocean resources for economic growth, improved livelihoods, and the preservation of marine ecosystems (Desa, 2016). It advocates for innovative business models that mimic natural systems, reduce waste, and promote resource efficiency. The framework aligns closely with global sustainability goals, particularly those outlined in the United Nations Sustainable Development Goals (SDGs), such as SDG 14, which focuses on life below water (Michalska-Szajer, Klimek & Dąbrowski, 2021). By integrating ecological principles with economic strategies, the Blue Economy Framework provides a holistic approach to fostering sustainability in ocean-based industries while ensuring social and economic benefits for communities reliant on marine resources.

In application to this study, the Blue Economy Framework serves as a guiding principle for transitioning towards sustainable practices that balance profitability with

environmental stewardship. For instance, it encourages the adoption of renewable energy technologies, such as wind and solar power, in port operations and shipping activities. Additionally, the framework supports the development of eco-friendly shipping technologies, including low-emission vessels and alternative fuels like hydrogen and ammonia. This provides a fertile ground for maritime entrepreneurship by highlighting the economic opportunities inherent in sustainable ocean resource utilization. The Blue Economy Framework is inherently aligned with the principles of sustainable development, as it emphasizes the interconnectedness of economic growth, environmental protection, and social well-being. The Blue Economy Framework thus positions the maritime sector as a key contributor to achieving global sustainability goals.

Some empirical studies were reviewed on topics relating to trends, challenges, and opportunities in maritime business and entrepreneurship for sustainable development. Oluwagbenga, Bello and Owoputi (2021) carried out a study on the challenges faced by entrepreneurs in accessing the untapped opportunities in the Nigerian maritime Industry. Data collection is via online questionnaires from 100 respondents. One way ANOVA was used to analyze the collected data. The result shows that lack of finance with the f-value of 543.656 is the greatest and is statistically significant among the variables identified. Then, followed by lack of education with f-value of 424.178, gender disparity with f-value 243.412, Unhealthy business environment with f-value of 196.271, lack of support with f-value of 139.882, cultural differences with 150.375 and family pressure with 83.515. The study therefore concluded that lack of finance is one of the major problems affecting entrepreneurs in accessing untapped opportunities in the Nigerian maritime industry.

Eneji et al. (2018) study was carried out to find out the impact of technology innovation on sustainable entrepreneurship development in Nigeria. The study uses survey method and interview with sampled stakeholders in Central Nigeria. Evaluation of findings was done using simple percentages statistical technique. The research design was a random survey of 1000 small scale enterprises and stakeholders in Nigeria's maritime industry. Simple percentages and multiple regression analysis were used to analyze the secondary data obtained from the study. Results of the study showed that 185 (21.6%) small scale entrepreneurs revealed that environmental protection laws seriously affect their maritime business operation. The study therefore concluded that sustainable entrepreneurship is closely and positively linked with technology innovation, which the absence of the former is caused by the inadequacy of the latter. The study recommended that educational and private sectors in Nigeria should play a leading role in indigenous technology incubation, innovation, adoption and transfer.

Discussing the theme of maritime business models, sustainability and digitization of operational processes at the ship-port interface, Del Giudice et al. (2022) investigated

the role of digitization in reducing the environmental impact of maritime and port activities aimed at meeting the 2030 Agenda and the SDGs. The study concluded that digitization at the port interface allows creating a link between the goals of SDGs 7 and 13, operating as a link for the unification of sustainable practices. The authors pointed out that the SDGs should be integrated into the strategic plans of maritime organizations, generating sustainable business models based on innovative technologies.

Addressing the existing barriers to achieving the SDGs in the Sri Lankan maritime sector, Katuwawala and Bandara (2022) identified, from interviews with port managers in the country, the reasons for the disparity between global standards of port sustainability and national practices. The study concluded that inefficient policies, structural, managerial and market restrictions and the absence of a standardized global port structure directed towards the SDGs are significant barriers to fulfilling the 2030 Agenda.

Four relevant empirical studies were reviewed in this study. A major problem that was evident from these empirical studies that were reviewed was a general dearth of research studies in the study population, which is Business Educators in tertiary institutions' maritime department. Also evident was the lack of research studies involving the study area, which is Delta State and Rivers State in South-South region of Nigeria. Most of the available research studies were conducted outside of South-South of Nigeria and most of such studies focused on the aspects of sustainable development goals (SDGs) of maritime organizations. This current study focused on the trends, challenges, and opportunities in maritime business and entrepreneurship for sustainable development. Therefore, it is the bid to fill this noticeable gap that motivated the study.

Methodology

The cross-sectional survey research design was employed in this study. The population of the study comprised of 91 educators in Business Education and Entrepreneurship Programmes across 4 tertiary institutions in Delta and Rivers State of Nigeria. Since the population is of manageable size, censor sampling technique was used as all population was sampled. The research instrument that was used in this study to generate data was a self-structured questionnaire, which was validated by three experts and it yielded a reliability coefficient score of 0.78. Statistics such as mean, standard deviation and ANOVA were used to analyze the study's data. The researcher and four research assistants, one from each of the four selected tertiary institutions, participated in the collection of data. The data collected was analyzed using descriptive such as frequency count, mean and standard deviation. Also, the stated hypotheses were tested using Analysis of Variance (ANOVA) statistics, which was set at a level of significance of 0.05.

Data Analysis

Table 1: Descriptive statistics showing the challenges of maritime business and entrepreneurship in South-South region of Nigeria

S/N	Items	N	Mean	SD	Remarks
1	High capital requirements pose a significant barrier to entry for new entrepreneurs in the maritime industry.	91	3.20	.871	Accept
2	Regulatory complexities and compliance with international maritime laws create challenges for maritime businesses	91	3.19	.934	Accept
3	The lack of access to advanced technologies hinders innovation in maritime entrepreneurship.	91	3.15	.990	Accept
4	Environmental regulations, such as those on emissions reduction, increase operational costs for maritime businesses	91	2.36	.942	Reject
5	Inadequate infrastructure, such as poorly equipped ports, limits the growth of maritime businesses in certain regions	91	2.89	.896	Accept
6	The maritime sector faces a shortage of skilled labour and expertise, impacting business efficiency and growth.	91	3.55	.917	Accept
7	Climate change and extreme weather events significantly disrupt maritime operations and logistics	91	2.29	.850	Reject
8	Limited access to financing and investment opportunities constrains the development of maritime entrepreneurial ventures.	91	3.04	.897	Accept
9	Competition from established global players makes it difficult for small maritime businesses to thrive	91	2.60	.921	Accept
10	Fragmented supply chains and logistical inefficiencies create operational challenges for maritime businesses	91	2.78	.993	Accept
	Aggregate Mean	**91**	**2.91**	**0.92**	**Accept**

Note: SD (Standard Deviation), N (Sample Size)

In response to the challenges of maritime business and entrepreneurship, Table 1 showed that majority of the respondents accepted all item statements except items 4 and

7. The mean ratings of items 1 to 10 ranged from 2.11 to 3.55 while the standard deviations ranged from 0.850 to 0.993. The aggregate mean showed a mean of 2.91 with a corresponding standard deviation of 0.92. With these results, top on the list of challenges facing maritime business and entrepreneurship is the shortage of skilled labour and expertise, followed by high capital requirements, and then, regulatory complexities and compliance. Other challenges include lack of access to advanced technologies, limited access to financing and investment opportunities, inadequate infrastructure, competition from established global players as well as fragmented supply chains and logistical inefficiencies.

Research Question 2: *What are the opportunities of maritime business and entrepreneurship for sustainable development in South-South region of Nigeria?*

Table 3 showed the results of participants' responses to the opportunities of maritime business and entrepreneurship for sustainable development in South-South region of Nigeria.

Table 2: Descriptive statistics showing the opportunities of maritime business and entrepreneurship for sustainable development in South-South region of Nigeria

S/N	Items	N	Mean	SD	Remarks
1	The growing demand for innovative shipping solutions presents significant opportunities for maritime businesses.	91	2.59	.771	Reject
2	Renewable energy projects, such as offshore wind farms, provide new avenues for maritime entrepreneurship.	91	2.54	.656	Accept
3	Innovations in digital technologies (e.g., blockchain, IoT, AI) create opportunities for enhancing maritime operations and sustainability.	91	2.97	.881	Accept
4	The blue economy offers untapped potential for developing sustainable marine tourism ventures.	91	2.62	.950	Accept
5	Government incentives and subsidies for sustainable practices encourage investment in maritime entrepreneurship.	91	2.48	.966	Reject

S/N	Items	N	Mean	SD	Remarks
6	The global shift toward low-carbon economies creates opportunities for alternative fuel development in the maritime industry.	91	2.81	.902	Accept
7	Collaboration with international organizations and stakeholders enhances opportunities for sustainable maritime initiatives.	91	3.10	.950	Accept
8	Circular economy practices, such as recycling ship components, open new business opportunities in the maritime sector.	91	2.21	.747	Reject
9	The increasing focus on marine biodiversity conservation creates opportunities for eco-friendly maritime businesses.	91	2.52	.940	Accept
10	Educational and training programs focused on sustainability provide opportunities to develop skilled labor for maritime entrepreneurship.	91	3.39	.708	Accept
	Aggregate Mean	**91**	**2.72**	**0.85**	**Accept**

Note: SD (Standard Deviation), N (Sample Size)

In response to the opportunities of maritime business and entrepreneurship for sustainable development, Table 2 showed that majority of the respondents accepted item statements 1, 2, 3, 4, 6, 7, 9, and 10 while items 5 and 8 were rejected by the respondents. The mean ratings of items 1 to 10 ranged from 2.21 to 3.39 while the standard deviations ranged from 0.656 to 0.966. The aggregate mean showed a mean of 2.72 with a corresponding standard deviation of 0.85. With these results, majority of the respondents are of the opinion that there are opportunities of maritime business and entrepreneurship for sustainable development. Top on the list of opportunities include educational and training programs focused on sustainability, followed by collaborating with international organizations and stakeholders, and then innovations in digital technologies. Other highlighted opportunities include a shift toward alternative fuel development, sustainable marine tourism ventures, renewable energy projects, innovative shipping solutions, as well as eco-friendly maritime businesses.

Testing of Research Hypotheses

Hypotheses 1: There is no significant difference that exists in the challenges of maritime business and entrepreneurship among selected educators across tertiary institutions in South-South region of Nigeria.

Table 3: ANOVA analysis showing results for the significant difference in the challenges of maritime business and entrepreneurship among selected educators across tertiary institutions in South-South region of Nigeria

	Sum of Squares	Df	Mean Square	F	Sig.
Between Subjects	211.010	4	304.019	0.214	.097
Within Subjects	108.204	318	25.727		
Total	319.214	322			

Result: F = 0.214, p>0.005.

Results displayed in table 3 showed that the associated p-value was greater than 0.05 (significance level), thus, the null hypothesis was accepted. Hence, the study concluded that there is no significant difference that exists in the challenges of maritime business and entrepreneurship among selected educators across tertiary institutions in South-South region of Nigeria. Hence, there is no significant difference in the responses of sampled educators across the selected tertiary institutions.

Hypotheses 2: There is no significant difference that exists in the opportunities of maritime business and entrepreneurship for sustainable development among selected educators across tertiary institutions in South-South region of Nigeria.

Table 4: ANOVA analysis showing results for the significant difference in the opportunities of maritime business and entrepreneurship for sustainable development among selected educators across tertiary institutions in South-South region of Nigeria

	Sum of Squares	Df	Mean Square	F	Sig.
Between Subjects	19238.575	4	2748.368	.017	.417
Within Subjects	5770.400	318	180.325		
Total	25008.975	322			

Result: F = 0.017, p>0.005.

Results displayed in table 4 showed that the p-value that is associated with the test statistics (ANOVA statistics) was greater than 0.05, thus, the null hypothesis was accepted. Hence, the study concluded that there is no significant difference that exists in the opportunities of maritime business and entrepreneurship for sustainable development among selected educators across tertiary institutions in South-South

region of Nigeria. Hence, difference does not exist in the responses of sampled educators across the selected tertiary institutions.

Discussion of Findings

Results of the study as regards research question one revealed that there are key trends in the maritime business and entrepreneurship, including digital technologies adoption, innovative shipping practices, such as the use of energy-efficient vessels, and renewable energy sources integration. Other trends that were highlighted by majority of the respondents include automated port operations, sustainability considerations, a shift toward more collaborative and integrated global supply chain practices, as well as marine biotechnology and eco-tourism. In support of this finding, Del Giudice et al. (2022) study revealed that digitization is a new trend that is reducing the environmental impact of maritime and port activities aimed at meeting the 2030 Agenda and the SDGs

The findings of research question two revealed that top on the list of challenges facing maritime business and entrepreneurship is the shortage of skilled labour and expertise, followed by high capital requirements, and then followed by regulatory complexities and compliance. Other challenges include lack of access to advanced technologies, limited access to financing and investment opportunities, inadequate infrastructure, competition from established global players as well as fragmented supply chains and logistical inefficiencies. This finding is in line with Katuwawala and Bandara (2022) study whose findings revealed that inefficient policies, structural, managerial and market restrictions and the absence of a standardized global port structure directed towards the SDGs are significant barriers to maritime business and entrepreneurs. In another study, Oluwagbenga, Bello and Owoputi (2021) study found that lack of finance is the greatest challenge facing maritime business and entrepreneurship, followed by lack of education, gender disparity, unhealthy business environment, lack of support, cultural differences, and family pressure. In a separate study, Eneji et al. (2018) study revealed that environmental protection laws seriously affect the business operation of small scale entrepreneurs in the maritime sector.

Study findings in respect to research question three revealed that the opportunities that are abound in maritime business and entrepreneurship include educational and training programs focused on sustainability, collaborating with international organizations and stakeholders, and innovations in digital technologies. Other highlighted opportunities include a shift toward alternative fuel development, sustainable marine tourism ventures, renewable energy projects, innovative shipping solutions, as well as eco-friendly maritime businesses. In line with this study, Kontakos (2019) stated that trends such as technology advancements, globalization, and consumer demands have significantly reshaped the maritime sector, creating both opportunities for maritime business and entrepreneurship. Also in line with the study findings, Santos (2021) study

concluded that the conducive environment for maritime entrepreneurship fosters new opportunities for maritime business and entrepreneurship towards a more sustainable future.

An analysis of hypothesized relationships revealed that there is no significant difference that exists in the trends, challenges as well as opportunities of maritime business and entrepreneurship among selected educators across tertiary institutions in South-South region of Nigeria. Hence, difference does not exist in the responses of sampled educators across the selected tertiary institutions as regards the trends, challenges as well as opportunities of maritime business and entrepreneurship.

Conclusion

This study assessed the trends, challenges, and opportunities in maritime business and entrepreneurship for sustainable development. The findings have provided empirical evidence to suggest that there are key trends, challenges, and opportunities in maritime business and entrepreneurship. In conclusion, understanding the trends, challenges, and opportunities in maritime business and entrepreneurship is essential for driving sustainable development. By addressing challenges, leveraging emerging opportunities, and embracing innovative practices, the maritime industry can achieve economic growth, environmental conservation, and social equity, contributing significantly to global sustainability goals.

Recommendations

1. Governments and industry stakeholders should establish funding mechanisms and innovation hubs to support research and development of sustainable technologies in the maritime sector.
2. Maritime industry stakeholders should implement and enforce comprehensive policies that promote environmental sustainability, such as stricter emissions standards and incentives for adopting low-carbon technologies, while ensuring alignment with international maritime laws.
3. There should be investment in modernizing maritime infrastructure, including ports and shipyards, to support sustainable practices like renewable energy adoption, waste recycling, and efficient logistics systems.
4. Educators in Maritime Departments of tertiary institutions should offer targeted training programs and educational initiatives to equip maritime entrepreneurs and workers with skills in sustainability, digital technologies, and innovative business models.
5. There should be collaboration between governments, private sectors, and international organizations to share knowledge, resources, and best practices for sustainable maritime business and entrepreneurship.

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