

Assessment On The Role Of Shipping In Advancing The Blue Economy In Tanzania.

(Case of Maersk Shipping Line)

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Abstract

This study examines the role of the shipping industry in advancing the Blue Economy in Tanzania, with a specific focus on Maersk Shipping Line. The research investigates how shipping contributes to economic growth, evaluates the regulatory frameworks governing the sector, and identifies the challenges that hinder its effectiveness in supporting sustainable ocean-based development. Using a mixed-methods approach, data were collected through questionnaires and interviews with key stakeholders in the maritime sector. The Blue Economy concept emphasizes the sustainable use of marine and coastal resources for economic advancement, and shipping plays a critical role as a key enabler of trade, employment, and investment. A methods approach was employed, combining quantitative data from structured questionnaires with qualitative insights from interviews. The findings indicate that the shipping industry significantly contributes to Tanzania's Blue Economy through facilitating trade, enhancing regional integration, and providing employment. Maersk Shipping Line, as a major global operator, plays a strategic role in improving efficiency and reliability in Tanzania's maritime logistics. However, the study identifies several challenges, including inadequate port infrastructure, high shipping costs, weak enforcement of environmental regulations, and maritime security concerns. While regulatory frameworks exist and are generally aligned with international standards, implementation gaps remain. The study concludes that strengthening infrastructure, improving regulatory coordination, promoting environmental sustainability, and enhancing maritime security are essential for unlocking the full potential of the shipping industry in advancing Tanzania's Blue Economy. And the efforts to combat piracy, illegal fishing, and smuggling must be intensified through improved surveillance, patrols, and regional cooperation to ensure safe and secure shipping operations.

1.1 Background of the Study

The Blue Economy is an emerging economic paradigm that emphasizes the sustainable utilization of ocean and water resources for economic growth, improved livelihoods, and environmental conservation Karanja. (2019). It encompasses various sectors, including fisheries, maritime transport, tourism, energy, and biotechnology. Tanzania, with its extensive coastline along the Indian Ocean and significant inland water bodies, has vast potential to develop its Blue Economy to enhance economic development and regional integration (TPA, 2020).

Shipping plays a crucial role in advancing the Blue Economy by facilitating international trade, boosting economic activities in coastal and port cities, and providing employment opportunities Smith & Patel (2020). Maritime transport remains the backbone of global commerce, with over 90% of international trade conducted through seaborne transportation. Tanzania, strategically located along the East African coast, serves as a gateway for landlocked countries such as Uganda, Rwanda, Burundi, and the Democratic Republic of the Congo. The efficiency and development of Tanzania's shipping sector significantly impact trade, industrialization, and regional connectivity (TPA, 2020).

Despite its strategic position, Tanzania's shipping industry faces several challenges, including inadequate port infrastructure, inefficient logistics systems, high operational costs, and environmental concerns. The expansion and modernization of ports such as Dar es Salaam, Tanga, and Mtwara are essential for enhancing Tanzania's competitiveness in the maritime sector (TPA, 2020). Furthermore, integrating sustainable shipping practices, such as adopting green technologies and reducing carbon emissions, is vital for ensuring long-term economic and environmental sustainability.

The role of shipping in Tanzania's Blue Economy extends beyond cargo transport. It also includes supporting the fisheries sector, marine tourism, and offshore resource exploration. Effective policies, investment in maritime infrastructure, and capacity building are necessary to harness the full potential of the shipping industry in driving economic growth (UNECA, 2019). By improving maritime governance, fostering regional cooperation, and leveraging technological advancements, Tanzania can enhance its position as a key player in the Blue Economy.

2.0 Literature Review

2.1 Empirical Review

“The Role of Shipping in Economic Development”

Smith, 2017 analyzed the contribution of shipping to the economic growth of developing nations, focusing on countries with significant maritime resources like Tanzania. It found that improvements in port infrastructure and shipping efficiency directly contributed to increased trade volumes, GDP growth, and employment creation. The research concluded that for countries to fully realize the economic potential of shipping, investments in port facilities, logistical systems, and human capital are essential. This study supports the argument that improving Tanzania's port infrastructure and integrating it with regional and international shipping networks can stimulate significant economic growth.

“Maritime Transport and Its Contribution to GDP in Developing Economies”

Harris & Green, 2020 examined the relationship between maritime transport and the GDP of several developing nations. It revealed that countries with access to well-developed maritime transport systems had a higher proportion of their GDP derived from international trade, particularly through the shipping sector. The study emphasized the need for improving port capacity and streamlining customs processes to enhance competitiveness. This study reinforces the need for Tanzania to invest in both port infrastructure and trade facilitation measures to maximize the economic benefits of its shipping sector.

“The Impact of Shipping on Marine Conservation in Coastal Economies”

Liu & Wang, 2021, explored the impact of shipping activities on marine ecosystems in coastal economies, focusing on pollution from ships, such as oil spills, ballast water, and waste. The study found that countries that adopted stringent environmental regulations and promoted eco-friendly shipping practices experienced better outcomes in terms of marine conservation and long-term sustainability.

Given Tanzania's rich marine biodiversity and reliance on coastal resources, this study underscores the need for effective maritime governance and the promotion of eco-friendly shipping practices to safeguard marine ecosystems.

3.0 Research Methodology

3.1 Research Design

The descriptive design used to describe the characteristics and trends within the shipping industry in Tanzania and its contribution to the Blue Economy (Saunders et al., 2019). This approach focusses on detailing existing conditions, practices, and patterns, as well as how shipping impacts different sectors like marine fisheries, tourism, trade, and environmental sustainability.

3.2 Data Analysis

Quantitative Data Analysis

Quantitative data were primarily obtained through structured survey instruments designed to measure various indicators of the shipping industry's contribution to the Blue Economy in Tanzania. Upon completion of data collection, the quantitative responses were systematically coded and entered into the Statistical Package for the Social Sciences (SPSS) Version 24, supplemented by Microsoft Excel for tabulation, visualization, and additional computational support. The analysis was guided by the methodological recommendations of Creswell and Creswell (2018), ensuring a robust statistical framework.

Qualitative Data Analysis

Qualitative data were collected through semi-structured interviews, focus group discussions, and field observations targeting stakeholders across the maritime value chain, including government officials, port authorities, shipping operators, and environmental agencies. These data sources aimed to capture in-depth insights into the operational realities, policy frameworks, and strategic challenges facing the shipping industry in advancing the Blue Economy agenda.

4.0 Research Findings, Analysis and Discussion

4.1 The contribution of the shipping industry to Tanzania's Blue Economy

The industry supports the sustainable utilization of marine resources by promoting responsible shipping practices that align with environmental protection goals. For instance, Maersk's global commitments to reduce carbon emissions resonate with Tanzania's aspirations for a greener Blue Economy.

Table 4. 1: The contribution of the shipping industry to Tanzania's Blue Economy

| Variable | Mean | Standard Deviation | Source: Field data, 2025 |
|--|------|--------------------|---|
| The shipping industry contributes to economic growth | 4.53 | 0.60 | The shipping industry contributes to economic growth, the mean score of |
| Port operations support regional integration | 4.36 | 0.58 | |
| Shipping provides employment | 4.48 | 0.60 | |
| Shipping promotes tourism and investment | 4.57 | 0.61 | |
| Infrastructure improved Tanzania's trade competitiveness | 4.51 | 0.64 | |

4.53 on a 5-point Likert scale indicates a very high level of agreement among respondents that the shipping industry plays a significant role in contributing to Tanzania's economic growth. Since this value is close to 5 (Strongly Agree), it shows that the majority of respondents strongly recognize the economic importance of the shipping sector. The standard deviation of 0.60 reflects a low degree of variability in responses, meaning that most participants responded similarly generally choosing "Agree" or "Strongly Agree". This reinforces the consistency of the perception across different stakeholders surveyed, including government officials, shipping line employees, freight forwarders, and import/export businesses. World Bank (2019), The World Bank notes that maritime transport is a driver of economic transformation in Africa, enabling industrialization, job creation, and integration into global value chains. This result suggests that stakeholders across the shipping and maritime value chain in Tanzania believe the industry: Facilitates international trade and economic linkage, Enhances GDP through port revenues, taxes, and maritime services and Stimulates employment and investment along the coast and logistics corridors. In the context of the Blue Economy, this finding confirms that shipping is not just a transport mechanism but a strategic pillar of Tanzania's broader sustainable ocean-based development strategy.

"The shipping industry is absolutely crucial for our economy. It facilitates the import and export of goods, which directly impacts trade and business growth. Without efficient shipping services, many sectors would struggle to operate effectively."

Port operations support regional integration, a mean score of 4.36 on a 5-point Likert scale indicates that respondents generally agree that port operations in Tanzania play a key role in supporting regional integration. This score is well above the neutral midpoint (3) and close to "Strongly Agree", suggesting widespread consensus among stakeholders. The low standard deviation of 0.58 shows that the responses were tightly clustered around the mean meaning that most participants held similar views, reinforcing the reliability of this result. Tanzania's strategic geographic location along the Indian Ocean positions it as a gateway for landlocked East and Central African countries. The findings reflect the recognition of Tanzanian ports as key logistics hubs for regional import/export trade, Enablers of cross-border supply chains and customs harmonization and Contributors to regional economic communities like EAC and SADC (Trademark East Africa (2021).

"Efficient port operations are the backbone of regional trade. Tanzania's ports act as gateways for neighboring landlocked countries, making integration and cooperation possible."

Shipping provides substantial employment opportunities for Tanzanians, the mean score of 4.48 indicates a strong level of agreement among respondents that the shipping sector provides significant employment opportunities in Tanzania. This value is close to "Strongly Agree" (5), which suggests that most participants view the industry as a key employer within the national economy. The standard deviation of 0.60 shows that the responses were consistently aligned, with little variation implying a shared understanding across stakeholder groups. This result confirms that the shipping industry is not only essential for trade but is also a vital employer, supporting

both skilled and unskilled labor markets. Investing in port development and shipping logistics has the potential to significantly contribute to poverty reduction and inclusive economic growth through sustainable employment.

"The shipping sector creates many jobs, not only at the ports but also in related fields like logistics, customs, and freight forwarding. It's a significant source of employment for many people."

Shipping promotes tourism and investment, mean of 4.57, This indicates that respondents generally strongly agree that shipping promotes tourism and investment. Since the scale is likely from 1 (Strongly Disagree) to 5 (Strongly Agree), a mean close to 5 shows a strong positive perception. Standard Deviation of 0.61: The relatively low standard deviation suggests that responses are fairly consistent among participants, meaning most agree with the statement and there isn't much variation. Shipping acts as a crucial enabler of tourism by providing maritime transport for tourists, cruise ships, and facilitating accessibility to coastal and island destinations. Additionally, efficient shipping infrastructure encourages foreign and domestic investment by enabling smooth import-export activities, reducing logistical costs, and fostering trade. The data supports the notion that shipping is widely recognized for its positive role in boosting tourism and attracting investment, contributing to economic development (AfDB, 2021).

"The maritime sector attracts investment not just in shipping but also in port infrastructure, logistics, and hospitality services, creating a positive cycle for tourism and business."

Infrastructure improved Tanzania's trade competitiveness Mean of 4.51. This shows that respondents agree to strongly agree that infrastructure improvements have enhanced Tanzania's ability to compete in trade. Being close to 5 indicates a high level of positive perception. Standard Deviation of 0.64. This moderate-low standard deviation indicates that most respondents share similar views, though there is slightly more variation compared to the previous variable. Infrastructure such as ports, roads, railways, and communication networks is critical for enabling efficient trade by reducing transportation costs and delivery times. In Tanzania, improvements in infrastructure have likely facilitated smoother movement of goods across borders and within the country, boosting trade competitiveness regionally and globally. This finding aligns with economic theory and empirical studies showing that better infrastructure supports trade growth by lowering barriers and increasing market access (IMO, 2020).

"The improvements in port and transport infrastructure have significantly reduced turnaround times and shipping costs, making Tanzania more competitive in trade."

4.2 The regulatory frameworks and policies in governing the shipping industry in Tanzania.

This section analyzes how respondents perceive the effectiveness and adequacy of the regulatory environment governing the shipping sector in Tanzania. The analysis is based on mean and standard deviation scores derived from Liker-scale responses.

Table 4. 2: Mean and Standard Deviation of Responses on Regulatory Frameworks and Policies

| Variable | Mean | Standard Deviation |
|--|------|--------------------|
| Environmental regulations are effectively enforced | 3.99 | 0.80 |

| Variable | Mean | Standard Deviation |
|--|------|--------------------|
| Port State Control (PSC) inspections are regularly conducted | 4.16 | 0.78 |
| Government regulations are adequate for Blue Economy growth | 4.10 | 0.82 |

Source: Field data, 2025

Environmental regulations are effectively enforced, mean of 3.99, this suggests that respondents generally agree that environmental regulations in the shipping industry are effectively enforced. However, the score is close to the neutral midpoint (3.0), implying a moderately positive perception rather than strong agreement. Standard Deviation of 0.80, this indicates moderate variability in the responses. While many respondents agree, a noticeable number might be neutral or slightly disagree, showing some level of mixed opinion. This result suggests that although there is a general belief that environmental regulations are being enforced, there may still be concerns about consistency, effectiveness, or enforcement capacity. Factors like limited institutional resources, lack of monitoring, or compliance gaps could influence public perception. This aligns with studies in developing maritime economies like Tanzania, where environmental enforcement is improving but still faces operational and regulatory challenges (UNEP, 2022; IMO, 2020).

"Environmental regulations exist, but enforcement can be inconsistent. Sometimes, lack of resources and coordination make it difficult to ensure full compliance."

Port State Control (PSC) inspections are regularly conducted, mean of 4.16: This indicates that respondents generally agree that PSC inspections are regularly conducted in Tanzania. A score above 4.0 reflects a positive perception of compliance oversight at ports. Standard Deviation of 0.78: This value indicates a moderate variation in responses. While most agree, a few respondents may have different views, suggesting uneven experiences or observations about PSC activities. Port State Control (PSC) is a critical mechanism for enforcing international maritime standards on foreign-flagged ships. The mean score shows that there is public confidence in the presence and frequency of these inspections in Tanzanian ports. However, the standard deviation points to possible inconsistency in implementation some ports may be more effective than others, or some vessels may be inspected more thoroughly. This is consistent with regional challenges, where despite institutional commitment, variability in port capacity, resources, and training affects the uniformity of PSC enforcement (IMO, 2023; AfDB, 2021).

"PSC inspections are more frequent now than before, which has helped improve ship safety and environmental standards."

Government regulations are adequate for Blue Economy, mean of 4.10: Respondents generally agree that government regulations are adequate to support the development of the Blue Economy in Tanzania. The mean score being slightly above 4.0 shows moderate agreement, but not overwhelming confidence. Standard Deviation of 0.82: This indicates a moderate spread in responses. While most participants agree, some are likely neutral or unsure, reflecting divergent experiences or varying exposure to how these regulations are applied or impact different sectors. This result suggests that the government has made efforts to establish a regulatory framework for the Blue Economy, such as policies on marine conservation, port development, maritime safety, and fisheries governance. However, the moderate variability in responses implies that some stakeholders may feel these regulations are not fully developed, inclusive, or effectively enforced. This perception aligns with findings from institutions like the World Bank (2021) and UNEP (2022), which note that many African coastal countries, including Tanzania, are still transitioning from sectoral maritime policies to integrated Blue

Economy strategies. Gaps in regulatory coherence, institutional capacity, and enforcement mechanisms could explain the variability in perception.

"The existing regulations provide a solid framework, but implementation and enforcement need strengthening for better results."

4.3 The Challenges Facing the Shipping Sector in Enhancing the Blue Economy in Tanzania

This section analyzes the perceived challenges that hinder the shipping sector from fully contributing to the Blue Economy. The analysis uses the mean and standard deviation of responses.

Table 4. 3: Mean and Standard Deviation of Responses on Shipping Sector Challenges

| Variable | Mean | Standard Deviation | Source: Field data, 2025 |
|---|------|--------------------|---|
| There are significant challenges related to port infrastructure | 4.23 | 0.76 | There are significant challenges related to port infrastructure, mean of 4.23: This |
| Tanzania faces challenges in ensuring maritime safety and security | 4.19 | 0.81 | |
| Shipping costs are relatively high compared to East African countries | 4.31 | 0.74 | |

reflects that respondents agree there are significant challenges facing Tanzania's port infrastructure. A mean above 4.0 shows strong awareness and concern from participants. Standard Deviation = of 0.76: The relatively moderate deviation implies that while most respondents share this view, there is still some variation in experiences or perceptions. This result suggests that port infrastructure is a major barrier to the effective performance of the shipping sector. Common issues may include: Congestion at key ports, Inefficient cargo handling systems and Delays in offloading and customs clearance. These findings are consistent with literature, such as World Bank (2020): Highlights inefficiencies and delays at East African ports.

"Port infrastructure remains a major bottleneck. Congestion and outdated equipment slow down cargo handling, affecting overall efficiency."

Tanzania faces challenges in ensuring maritime safety and security, mean of 4.19: Respondents agree that maritime safety and security remain challenges in Tanzania. A score above 4.0 confirms this is a shared concern among stakeholders. Standard Deviation of 0.81: This indicates a moderate variation in responses. While the majority agrees, there is some diversity in how strongly respondents feel about the issue. This data point reveals that maritime safety and security are still problematic for Tanzania's shipping sector. Challenges may include: Inadequate search and rescue infrastructure, Limited surveillance and monitoring of territorial waters and Threats such as piracy, smuggling, and illegal fishing. According to sources like IMO (2023) and UNCTAD (2022), many developing maritime nations, including Tanzania, face institutional and technical limitations in enforcing maritime security standards. These gaps not only risk lives and property but can also deter investment and international partnerships.

"Security concerns like piracy and illegal fishing remain prevalent, threatening safe shipping operations."

Shipping costs are relatively high compared to East African countries, mean of 4.31: This suggests that respondents strongly agree that shipping costs in Tanzania are relatively high compared to other East African countries. The high mean indicates broad recognition of

the issue. Standard Deviation of 0.74: This relatively low standard deviation reflects consistent responses among participants most perceive high shipping costs as a shared burden or constraint. The finding indicates that high shipping costs are a notable challenge to Tanzania's maritime competitiveness. These elevated costs may be attributed to: Inefficiencies in port operations, long dwell times and cargo delays, Cumbersome customs clearance procedures and Limited competition among shipping lines. According to the World Bank (2020) and Trademark East Africa (2021), Tanzania's import/export shipping costs are often higher than those in Kenya or Djibouti, largely due to operational inefficiencies and regulatory bottlenecks. This undermines Tanzania's position as a regional logistics hub.

"Shipping costs here are notably higher, which reduces our competitiveness in the regional market."

4.4 Reliability Analysis

Reliability analysis was conducted to assess the internal consistency of the questionnaire items used in the study. Cronbach's Alpha coefficient was calculated for each construct to determine the reliability of the measurement scales.

Table 4. 4: Reliability Statistics

| Construct | Number of Items | Cronbach's Alpha | Interpretation |
|--|-----------------|------------------|-----------------------|
| Contribution of Shipping to Blue Economy | 5 | 0.87 | Excellent Reliability |
| Regulatory Frameworks and Policies | 4 | 0.82 | Good Reliability |
| Challenges Facing the Shipping Sector | 6 | 0.85 | Excellent Reliability |

Source: Field data, 2025

The Contribution of Shipping to Blue Economy construct demonstrated excellent reliability with a Cronbach's Alpha of 0.87, indicating that the items measuring this concept were highly consistent. The Regulatory Frameworks and Policies construct showed good reliability ($\alpha = 0.82$), suggesting that respondents consistently perceived the effectiveness and challenges related to the regulatory environment. The Challenges Facing the Shipping Sector construct also exhibited excellent reliability ($\alpha = 0.85$), confirming the internal consistency of items related to operational and infrastructural challenges. Overall, the reliability analysis indicates that the data collection instrument was reliable and appropriate for capturing respondents' views on the role of shipping in advancing Tanzania's Blue Economy. These results validate the credibility of subsequent analysis and conclusions drawn from the data.

4.5 Regression Analysis

To examine the influence of key factors on the advancement of Tanzania's Blue Economy, a multiple linear regression analysis was conducted. The dependent variable was the Perceived Advancement of the Blue Economy, while the independent variables included: Contribution of Shipping Industry, Effectiveness of Regulatory Frameworks and Challenges Facing the Shipping Sector.

Table 4. 5: Model Summary

| Model | R | R ² | Adjusted R ² | Std. Error of Estimate |
|-------------|------|----------------|-------------------------|------------------------|
| 1 (Overall) | 0.78 | 0.61 | 0.59 | 0.42 |

Source: Field data, 2025

The model explains approximately 61% of the variance in the perceived advancement of the Blue Economy, indicating a strong relationship between the independent variables and the dependent variable.

Table 4. 6: Regression Coefficients

Source: Field data, 2025

| Predictor | B | Std. Error | Beta | t | Sig. |
|----------------------------|-------|------------|-------|-------|-------|
| Constant | 0.58 | 0.15 | | 3.87 | 0.000 |
| Contribution of Shipping | 0.52 | 0.08 | 0.55 | 6.50 | 0.000 |
| Regulatory Frameworks | 0.34 | 0.07 | 0.38 | 4.86 | 0.000 |
| Challenges Facing Shipping | -0.29 | 0.09 | -0.30 | -3.22 | 0.002 |

The Contribution of Shipping Industry positively and significantly influences the advancement of the Blue Economy ($\beta = 0.55$, $p < 0.001$). This suggests that improvements in shipping services lead to perceived progress in Blue Economy outcomes.

The Effectiveness of Regulatory Frameworks also has a significant positive effect ($\beta = 0.38$, $p < 0.001$), indicating that stronger and more efficient regulations support Blue Economy development.

Conversely, Challenges Facing Shipping negatively impact the Blue Economy ($\beta = -0.30$, $p = 0.002$). The more severe the challenges (e.g., infrastructure deficits, high costs), the lower the advancement perceived.

5.0 Conclusion and Recommendation

5.1 Conclusion

The study has established that the shipping industry plays a vital role in advancing Tanzania's Blue Economy by facilitating international trade, promoting regional integration, and generating employment opportunities. Maersk Shipping Line, as a leading operator, significantly contributes to the efficiency and reliability of maritime transport services in Tanzania, which in turn supports economic growth and sustainable use of marine resources.

5.2 Recommendations of the study

Based on the findings of this study, the following recommendations are proposed to enhance the role of the shipping industry in advancing Tanzania's Blue Economy:

Infrastructure Development and Modernization

One of the critical challenges identified in the study is the inadequate and outdated maritime infrastructure in Tanzania, which constrains the shipping sector's capacity to effectively support the Blue Economy. To address this, it is essential for both the government and private stakeholders to prioritize investments in the modernization and expansion of port facilities. This includes upgrading cargo handling equipment, expanding berth capacity to accommodate larger vessels, and enhancing storage and logistics infrastructure within the ports.

Strengthening Regulatory Frameworks and Coordination

The study revealed that while Tanzania has established a regulatory framework aligned with international maritime conventions, challenges remain in effective enforcement and coordination among various maritime authorities. To improve the shipping sector's contribution to the Blue Economy, it is essential to strengthen these regulatory frameworks and enhance institutional coordination.

First, there should be a clear delineation of roles and responsibilities among regulatory bodies such as the Tanzania Maritime Authority (TMA), port authorities, customs, and environmental agencies to avoid duplication and bureaucratic delays. Establishing a centralized maritime regulatory coordination unit could help harmonize policies, streamline licensing procedures, and facilitate faster decision-making.

Second, regular review and updating of maritime laws and policies are crucial to keep pace with evolving international standards and emerging challenges, including environmental protection, safety, and security. Tanzania should continue to ratify and implement key international maritime conventions and ensure compliance through effective monitoring and enforcement mechanisms.

Capacity building within regulatory agencies is also necessary to equip officials with the knowledge and tools to effectively oversee shipping activities, manage risks, and respond to incidents promptly.

Finally, fostering stakeholder engagement through public-private dialogues will ensure that policies are responsive to industry needs and promote a collaborative approach to sector development.

Promoting Sustainable and Environmentally Friendly Shipping Practices

Given the importance of preserving marine ecosystems for the sustainability of Tanzania's Blue Economy, it is imperative that the shipping industry adopts environmentally friendly practices. The study highlights environmental concerns such as marine pollution, emissions, and waste management as significant challenges linked to shipping activities. To address these issues, the government, in collaboration with industry players like Maersk Shipping Line, should promote the adoption of green shipping technologies. This includes encouraging the use of low-sulfur fuels, energy-efficient vessels, and innovative propulsion systems such as LNG or hybrid engines to reduce greenhouse gas emissions.

Capacity Building and Skills Development

A key factor for the growth and efficiency of Tanzania's shipping sector is the availability of skilled human resources. The study identified gaps in technical expertise and operational capacity among maritime professionals and port workers, which can limit the sector's ability to adopt new technologies and comply with international standards. To address this, it is essential to invest in comprehensive capacity building and skills development programs. These should include targeted training in areas such as modern port

operations, maritime safety and security, environmental management, logistics, and digital technologies used in shipping and cargo handling.

Enhancing Maritime Security

Maritime security is a fundamental prerequisite for a thriving shipping industry and the sustainable development of Tanzania's Blue Economy. The study highlighted ongoing threats such as piracy, illegal fishing, smuggling, and maritime boundary disputes, which jeopardize safe navigation, trade, and marine resource conservation. To strengthen maritime security, Tanzania should enhance surveillance and monitoring capabilities by investing in modern technologies such as radar systems, Automatic Identification Systems (AIS), and satellite tracking. Strengthening naval and coast guard patrols along the coastline and within territorial waters will deter illicit activities.

Continuous Monitoring and Research

Sustained development of Tanzania's shipping sector and its contribution to the Blue Economy requires ongoing monitoring and research to adapt to changing conditions and emerging challenges. The study indicates that gaps in timely and accurate data collection hinder effective decision-making and policy formulation. To address this, it is essential to establish robust systems for continuous monitoring of shipping activities, port performance, environmental impacts, and regulatory compliance. Utilizing digital technologies such as real-time data analytics, Geographic Information Systems (GIS), and automated reporting can enhance the quality and accessibility of information.

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