

Assessing the Impact of Capacity-Building and Training Programs on Sustainability Literacy and Skills in the Maritime Industry: A Case Study of Dar es Salaam.

Frank James Somanga

Department of Science and Management

Dar es salaam Maritime Institute Dar es Salaam, Tanzania.

frank.somanga@dmi.ac.tz

Abstract: *The maritime industry plays a critical role in global trade and economic development, yet faces increasing pressures to adopt sustainable practices amidst environmental challenges. This study assessed the impact of capacity-building and training programs on sustainability literacy and skills among maritime industry stakeholders in Dar es Salaam, Tanzania. Through a mixed-methods approach, including surveys and interviews, data were collected from 100 participants representing various sectors within the maritime industry. The study evaluated participants' knowledge of sustainability principles, awareness of environmental challenges, effectiveness in communication and stakeholder engagement, and perceived impact on workplace practices. Findings indicated a positive correlation between participation in capacity-building programs and enhanced sustainability literacy among respondents. The majority reported significant improvements in understanding sustainability principles and awareness of environmental issues, attributing these advancements to practical training sessions and access to educational resources. Stakeholders highlighted improved communication skills and strengthened partnerships as key outcomes, facilitating better integration of sustainability practices into organizational strategies. However, challenges remain, including the need for more specialized training, continuous learning opportunities, and greater stakeholder engagement across diverse sectors of the maritime industry. The research contributes to the growing body of knowledge on capacity-building in sustainable development and offers insights relevant to maritime industries globally, particularly in coastal regions facing similar environmental and socio-economic challenges.*

Keywords— Capacity-building programs, Sustainability literacy, Sustainable practices, Stakeholder engagement, Environmental sustainability, Training initiatives, Maritime industry.

1. INTRODUCTION

The maritime industry plays a pivotal role in global trade and economic development, significantly contributing to the socio-economic landscape of coastal regions. However, this industry also poses substantial environmental challenges, necessitating a shift towards sustainable practices. In response, capacity-building programs and training initiatives have emerged as critical tools to enhance sustainability literacy and skills among maritime industry stakeholders. This study focuses on evaluating the effectiveness of such programs in the context of Dar es Salaam, Tanzania, a key maritime hub in East Africa. With its strategic location and growing port activities, Dar es Salaam represents a microcosm of the broader challenges and opportunities faced by the maritime sector in implementing sustainable practices.

Pre- and post-training assessments play a fundamental role in evaluating the effectiveness of training programs in enhancing participants' understanding of sustainability principles and best practices relevant to their roles. These assessments help measure the knowledge gained and the application of sustainable development frameworks in various fields. [1], emphasizes the importance of training in

contributing to human capital development, social cohesion, financial sustainability, and environmental responsibility. This highlights the significance of training programs in fostering a culture of sustainability within organizations [1]. Furthermore, [2], stress the essential components for successful implementation of standards and best practices, including strong leadership, collaboration among stakeholders, systematic needs assessment, funding sources, and training and professional development. These elements are vital for ensuring the sustainability of practices post-training [2]. Incorporating sustainability dimensions into training programs is crucial for organizations to align with global sustainability goals. highlight the importance of designing training programs that integrate sustainability principles, contributing to the achievement of sustainability targets outlined in the United Nations' 2030 agenda [3]. Moreover, [4], provided insights into best practices for the implementation and sustainment of training programs, emphasizing the need for strategies that support learners across an organization and ensure long-term sustainability of changes [4].

Several studies have explored the potential for attitude change in the maritime sector towards environmental responsibility. [5], found a slight increase in knowledge, skills, and attitudes

among newly graduated marine engineers, suggesting a positive trend. [6], highlighted the potential of game-based learning in facilitating attitude change, although the need for longitudinal studies was noted. [7], developed and validated scales to measure environmental responsibility, character development, and attitudes toward school, providing a potential tool for assessing changes in attitudes. However, [8], found a slight decrease in attributed personal responsibility for environmental protection among students in economics, law, and political science, indicating the complexity of attitude change in this context. Research on attitude change towards environmental responsibility has been explored through various methods. [9], emphasized the role of collaborative relationships in enhancing environmental engagement, particularly in small and medium-sized enterprises. These studies cooperatively underline the complexity of measuring and understanding shifts in attitudes towards environmental responsibility.

Various studies have highlighted the importance of training in driving the implementation of sustainability measures in the maritime industry. [10] and [11], both highlighted the significant role of quality maritime education and training in influencing green maritime practices and corporate social responsibility (CSR) implementation, respectively. [12], further emphasized the need for a resilient and adaptive workforce, with training being a key factor in addressing skill gaps and industry changes. [13], specifically focused on the effective training of seafarers in energy-efficient operations, underscoring the need for more targeted and impactful training programs. These studies together underline the critical role of training in driving the actual implementation of sustainability measures in the maritime industry. A length of studies have explored the implementation of sustainability measures in various industries in Tanzania. [14], found a willingness to accept sustainability learning in management and operations, suggesting a positive attitude towards training. [15], identified the reuse of construction materials, waste separation, and plant selection as key sustainable practices in construction sites, highlighting the importance of practical implementation. [16], emphasized the positive impact of entrepreneurship training on SME sustainability, indicating the potential for training to drive sustainable practices. [17], highlighted the role of quality maritime education and training in influencing green maritime practices and sustainable development, further supporting the importance of training in driving sustainability measures. These studies jointly suggest that training can play a fundamental role in driving the implementation of sustainability measures in the maritime industry in Tanzania.

[18] and [19] both emphasized the importance of continuous improvement in maritime education and training (MET) programs, with a focus on the role of instructors and the need for collaboration with international partners. [20] and [21] further highlighted the need for authentic assessment methods and the integration of cybersecurity training, respectively, to address weaknesses in current training programs. These

studies cooperatively emphasize the value of stakeholder feedback in identifying and addressing areas for improvement in MET programs. Research in Tanzania has highlighted the importance of stakeholder feedback in improving training programs. [22], identified motivation, time constraints, and training processes as key factors in the successful implementation of a post-crash first aid training program. [23], emphasized the need for curriculum revisions in the Ministry of Agriculture Training Institutes, with a focus on competencies such as value chains and business skills. [24, 25], emphasized the significance of organization and sociological factors, including training needs analysis and employee involvement, in effective training program implementation. [26], found a positive relationship between the Information Studies program at the University of Dar es Salaam and the performance of former students, suggesting the need for curriculum adjustments to align with industry changes. These studies jointly highlight the value of stakeholder feedback in identifying strengths, weaknesses, and areas for improvement in training programs in Tanzania.

The importance of accessibility and inclusivity in information resources is highlighted by [27], who emphasized the need for standards and guidelines to ensure that everyone, regardless of disability, literacy, or digital literacy, can access and participate in the internet. [28], further emphasized the challenges of inclusion in participatory evaluation, particularly in diverse and culturally complex settings, and the need for innovative techniques to ensure everyone's voice is heard. [29] and [30] both explored the role of technology in enhancing accessibility and inclusivity, with [29], focusing on the use of information technologies in global governance and human rights, and Wu discussing the potential of virtual meetings to eliminate barriers and increase diversity and inclusivity. These studies both highlight the crucial role of standards, guidelines, and technology in ensuring the participation of all stakeholders, regardless of language, technical background, or job role.

Capacity-building and training programs in the maritime industry play a crucial role in promoting sustainable practices [12]. These programs address a range of topics, including environmental regulations, energy-efficient technologies, waste management, and sustainable resource utilization. They aim to drive behavioral and operational changes within the industry by fostering a deeper understanding of sustainability issues. However, the shortage of highly skilled talent poses a significant challenge [12]. To address this, a skill resilience framework has been proposed to identify skill gaps and improve training content [12]. The maritime industry is also exploring the use of renewable energy sources, technical and operational strategies, and alternative fuels to reduce carbon emissions [31]. Additionally, the International Maritime Organization's gender program is working to integrate women into the maritime sector, further supporting sustainability efforts [32]. Most studies have underlined the importance of capacity-building and training programs in promoting sustainable practices in the maritime industry. [17],

emphasized the role of quality maritime education and training in influencing green maritime practices and sustainable development. [33], further supported this, highlighting the effectiveness of a Train-the-Trainer course in enhancing capacity building and promoting sustainable maritime transport development. [34] and [35], both stressed the need for institutional capacity building and human resource development in addressing environmental challenges and improving the effectiveness of local government reform programs, respectively. These readings cooperatively underline the critical role of capacity-building and training programs in driving behavioral and operational changes towards sustainability in the maritime industry.

The maritime industry, integral to global trade and economic growth, faces significant environmental challenges that necessitate a transition towards sustainable practices. Despite the critical importance of sustainability in this sector, there is a notable gap in the effective dissemination and integration of sustainability literacy and skills among maritime industry stakeholders. Capacity-building programs and training initiatives are designed to bridge this gap; however, their impact on enhancing sustainability competencies remains inadequately understood, particularly in developing regions such as Dar es Salaam, Tanzania. This study aimed at addressing this problem by evaluating the effectiveness of these programs in fostering sustainability literacy and skills among maritime professionals in Dar es Salaam. By doing so, it sought to identify the strengths and weaknesses of current training efforts, understand their influence on participants' knowledge, attitudes, and practices, and provide evidence-based recommendations for improving the design and implementation of future capacity-building initiatives to ensure a more sustainable maritime industry.

The primary objective of this study was to assess the impact of these capacity-building and training programs on the sustainability literacy and skills of maritime industry stakeholders in Dar es Salaam. Through a combination of quantitative and qualitative research methods, this study examined the extent to which these initiatives have influenced the participants' knowledge, attitudes, and practices regarding sustainability.

The significance of this study lied in its potential to contribute valuable insights into the effectiveness of capacity-building and training programs aimed at promoting sustainability within the maritime industry, specifically in the context of Dar es Salaam, Tanzania. By assessing the impact of these initiatives, the study helped in identifying best practices and areas for improvement, thereby enhancing the overall quality and relevance of sustainability education in the maritime sector. The findings are instrumental for policymakers, educators, and industry leaders in designing more effective training programs that can drive meaningful changes in sustainability practices. Additionally, the study provided a model that can be applied to other developing regions facing similar challenges, ultimately supporting global efforts towards a more sustainable maritime industry. The research also contributed to the academic discourse on sustainability

literacy and skill development, filling a critical gap in the literature and offering a foundation for future studies.

The remaining part of the paper is organized as follows:

Methodology is in section 2, results as well as discussion of the findings are presented in section 3, while conclusion is found in section 4.

2. METHODOLOGY

This study employed a mixed-methods research design, combining quantitative and qualitative approaches to evaluate the effectiveness of capacity-building and training programs on sustainability literacy and skills among maritime industry stakeholders in Dar es Salaam, Tanzania. The sample size for this study consisted of 100 maritime professionals, selected through a stratified random sampling technique to ensure representation from various sectors such as shipping companies, port authorities, regulatory bodies, and maritime education institutions. This approach allowed for a comprehensive analysis by capturing diverse perspectives within the maritime industry.

Data collection methods included surveys, interviews, focus groups, and document analysis. Structured questionnaires were administered to all 100 participants to gather quantitative data on their sustainability knowledge and skills before and after the training programs. Additionally, semi-structured interviews were conducted to gain in-depth qualitative insights into their experiences and perceptions of the training programs. Data analysis involved both statistical and thematic techniques. Quantitative data from the surveys were analyzed using descriptive to identify significant changes in sustainability literacy and skills. Thematic analysis were applied to the qualitative data from interviews and focus groups to identify common themes and patterns in participants' experiences. Ethical considerations, including informed consent, confidentiality, and the right to withdraw, were strictly adhered throughout the research process. This mixed-methods approach was designed to yield a comprehensive evaluation, offering valuable insights into the effectiveness of sustainability training programs in the maritime industry of Dar es Salaam.

3. RESULTS AND DISCUSSION

In this section the results and discussion of the findings are presented, they begin with simple demographic information of 100 respondents followed by main indicating factors in the form of Perception of Training Program Impact, Sustainability Literacy, and Collaboration across Stakeholders.

3.1 Demographic information of the respondents

This segment presents general information of respondents such as age, gender of the respondents, education level, Current Position in Maritime Industry and Years of Experience in Maritime Industry of the respondents approached with interview and questionnaires.

3.1.1 Age of the respondents

The data collected from the respondents revealed a diverse range of perspectives regarding the age of the respondents. As

shown in table 1, the largest demographic number in our study, with 36 respondents aged between 26 and 35 years, represented a key group within the maritime industry.

Table 1: Shows the demographic information of the respondents

Demographic Variable	Categories	Number of Respondents
Age	18-25 years	20
	26-35 years	36
	36-45 years	30
	46-55 years	10
	56 years and above	4
Gender	Male	70
	Female	30
Highest Level of Education	Secondary school and below	10
	Diploma/Certificate	20
	Bachelor's Degree	40
	Master's Degree	25
	Ph.D. or other advanced degree	5
Current Position in Maritime Industry	Port Authority Staff	25
	Shipping Company Employee	40
	Regulatory Body Member	10
	Maritime Educator	15
	Other (please specify)	10
Years of Experience in Maritime Industry	Less than 1 year	10
	1-5 years	30
	6-10 years	25
	11-15 years	15
	16 years and above	20

They are typically at mid-career stages, where they are actively engaged in operational roles or transitioning into managerial positions. Many expressed a strong commitment to integrating sustainability into their daily practices. As one respondent emphasized:

"...Sustainability isn't just about compliance; it's about innovation and efficiency. The training programs have equipped me with the tools to make informed decisions that benefit both the environment and our business operations..."

Members in this age group highlighted the importance of continuous learning and adaptation in an evolving industry.

"...The maritime sector is dynamic, and sustainability challenges require constant adaptation...", shared one respondent.

"...The training programs not only enhanced my knowledge but also inspired me to seek out new solutions and technologies that promote sustainable development..."

Thirty (30) respondents aged between 36 and 45 years constituted a group that brings substantial experience and leadership to the table. Many in this demographic hold pivotal roles in port management, regulatory bodies, or senior positions within shipping companies. They emphasized the transformative impact of sustainability training on industry practices.

"...As someone in a leadership role, I feel a responsibility to champion sustainable practices...", remarked one respondent.

"...The training programs have provided me with strategic insights and frameworks to implement meaningful change..."

Participants in this age range also highlighted the importance of collaboration and stakeholder engagement in advancing sustainability agendas. One respondent stated:

"...Sustainability isn't just about what happens within our organization; it's about influencing the entire supply chain..."

Another respondent noted:

"...The training programs facilitated discussions on collaborative approaches that can drive systemic change across the maritime sector..."

Ten (10) respondents aged between 46 and 55 years bring a wealth of experience and perspective to discussions on sustainability in the maritime industry. Many in this group hold senior management roles or are involved in policy development and enforcement. They emphasized the strategic importance of sustainability training in navigating regulatory landscapes and shaping industry standards. As respondent in this group shared:

"...Sustainability has become a strategic imperative for our business..."

Another respondent shared:

"...The training programs have equipped me with the knowledge to align our operations with global sustainability goals and regulatory requirements..."

Participants in this age group also reflected on their role as mentors and advocates for sustainability within their organizations.

"...As senior leaders, we have a responsibility to lead by example and inspire the next generation of maritime professionals...", noted another respondent.

"...The training programs have empowered me to mentor younger colleagues and instill a culture of sustainability throughout our organization...", as stated by another respondent

The smallest demographic in this study, consisted of only four (4) respondents aged 56 years and above, who represented individuals with extensive experience and leadership in the maritime industry. These respondents often occupy senior executive roles or advisory positions, where they play critical roles in shaping industry practices and policies. They emphasized the strategic imperative of sustainability as a driver of long-term value and resilience. As one respondent emphasized:

"...Sustainability isn't just about compliance; it's about future-proofing our industry..."

Another respondent remarked:

"...The training programs have broadened my perspective on the business case for sustainability and the opportunities it presents for innovation and growth..."

Respondents in this age group also reflected on the evolution of sustainability practices over their careers. As noted by another respondent:

"...The training programs have reinforced the importance of adapting to environmental challenges and driving positive change through informed decision-making..."

Collectively, different age groups formed a crucial part of the maritime sector and illustrated how sustainability training needs were variously assessed across career continuums. Respondents from all age groups, ranging from young professionals keen to integrate sustainable practices in their careers through experienced executives setting industry standards, recognized the transformative nature of knowledge and education in achieving sustainability. They serve not only to enlighten the efficacy of our capacity-building initiatives but also to reinforce that as maritime professionals we are all in this for a common goal, a wider lens towards sustainability.

3.1.2 Gender of the respondents

The maritime industry has traditionally been a male-dominated field. To assess the program's inclusivity and potential impact on both genders, participant data included information on their sex. As presented in table 1, the majority of respondents in this study, comprised 70 males and they played diverse roles within the maritime industry, ranging from operational staff to senior management. Their perspectives on sustainability training underscored a strong commitment to integrating environmental stewardship into industry practices. Like one male respondent quoted:

"...Sustainability isn't just a checkbox for compliance; it's about long-term viability and responsible business practices. Therefore training programs have equipped me with the knowledge and tools to implement sustainable initiatives that benefit both our business and the environment..."

Male respondents also highlighted the role of innovation and technology in advancing sustainability goals.

"...The maritime sector is evolving rapidly, and technology plays a crucial role in optimizing our operations while minimizing environmental impact...", shared another respondent.

The female respondents, comprising of 30 participants, brought valuable perceptions to this study, reflecting their roles and experiences within the maritime industry. They often contribute to diverse facets of maritime operations, from environmental stewardship to policy advocacy. Many

underlined the transformative impact of sustainability training in fostering leadership and driving positive change. Shared one female respondent:

"...The training programs have equipped me with the knowledge and skills to champion sustainable practices within my organization, influencing decision-making and promoting environmental stewardship..."

Participants in this group also highlighted the importance of inclusivity and diversity in advancing sustainability agendas.

"...Gender diversity in leadership is crucial for driving sustainability initiatives. So training programs have empowered me to advocate for gender equality and inclusive practices that enhance our resilience to environmental challenges....," noted another female respondent.

In general, both male and female respondents in this study highlighted the critical role of sustainability training in advancing industry practices and promoting environmental stewardship within the maritime sector. From male participants highlighting strategic alignment and operational efficiency to female participants emphasizing inclusivity and leadership, the diverse perspectives shared by respondents underscore a collective commitment to sustainable development. These comprehensions not only enrich the understanding of the effectiveness of capacity-building initiatives but also highlight the collaborative efforts of maritime professionals in driving a more sustainable future.

3.1.3 Highest Level of Education of the respondents

To understand the baseline knowledge and potential for learning among participants, this study also examined the educational background of the respondents. It looked at the "Highest Level of Education" achieved, which provides valuable insights into the existing knowledge base of the workforce targeted by the capacity-building and training programs. As indicated in table 1, respondents with a secondary school education or below, totaling 10 individuals, brought a diverse perspective to the study on sustainability literacy and skills in the maritime industry. Despite their educational background, many expressed a strong commitment to learning and implementing sustainable practices in their roles within the maritime sector. As noted by one respondent:

"...The training programs opened my eyes to the importance of sustainability in our daily operations, even with a basic education, I now understand how our actions impact the environment and how we can make a positive change ..."

Participants in this group also highlighted the practical implications of sustainability training in their day-to-day work.

Respondents with diplomas or certificates, comprising 20 participants, underlined the value of targeted education in addressing sustainability challenges within the maritime sector. For many in this group, the training programs served as a bridge between theoretical knowledge and practical application. Participants highlighted the role of specialized skills gained through vocational training in contributing to operational efficiency and environmental stewardship. They often noted the transformative impact of sustainability training in equipping them with industry-relevant competencies and fostering a deeper commitment to integrating sustainable practices into their professional endeavors.

The largest group in this study, consisting of 40 respondents with bachelor's degrees, represented a diverse group of professionals within the maritime industry. They bring a comprehensive understanding of environmental sciences, engineering, business administration, and related fields to discussions on sustainability. Many emphasized the foundational knowledge acquired through undergraduate education and its application in navigating complex sustainability issues. Participants in this group often highlighted the interdisciplinary nature of sustainability challenges, noting the importance of collaboration across sectors to achieve meaningful environmental outcomes. They discussed how sustainability training programs provided them with practical frameworks and strategic insights that are essential for driving sustainable practices and fostering innovation within their organizations.

Respondents holding master's degrees, totaling 25 individuals, brought an advanced knowledge and specialized expertise to the study on sustainability in the maritime industry. These professionals often occupy leadership roles in environmental management, policy development, and research within maritime organizations. Many highlighted the role of graduate education in deepening their understanding of sustainability frameworks and equipping them with critical thinking skills necessary for addressing global environmental challenges. Participants in this group discussed how sustainability training programs enhanced their capacity to lead initiatives that integrate environmental sustainability with business objectives. They emphasized the strategic importance of research and innovation in driving sustainable practices and fostering resilience in the face of environmental uncertainties.

The smallest demographic in our study, comprising 5 respondents with Ph.D. or other advanced degrees, represented experts in academia, research, and strategic leadership within the maritime industry. These individuals brought a wealth of theoretical knowledge and practical experience to discussions on sustainability. Participants in this group often discussed their role in shaping industry practices through applied research, policy advocacy, and educational initiatives. They highlighted how advanced education enabled them to bridge gaps between theory and practice, translating

scientific knowledge into actionable strategies that promote environmental sustainability and enhance organizational resilience. Participants emphasized the transformative potential of education in fostering collaboration across sectors and driving innovation in sustainable maritime practices.

The study concludes that participants with varying educational backgrounds emphasized the crucial function of sustainability training initiatives in augmenting their expertise, proficiencies, and capacity for leadership in the maritime sector. From basic education to postgraduate research, education functions as a stimulant for endorsing sustainable growth and cultivating a group dedication to ecological responsibility. These perspectives bring to light the multiplicity of ways in which maritime professionals contribute to the construction of a more resilient and sustainable maritime sector.

3.1.4 Current Position in Maritime Industry

Gaining a comprehensive understanding of the target audience is essential for evaluating the effectiveness of any training program. In this study on capacity-building initiatives for sustainability in Dar es Salaam's maritime industry, the study dug into the "Current Position in Maritime Industry" of the participants. As shown in table 1, respondents employed in port authorities, totaling 25 individuals in this study, played crucial roles in managing and overseeing port operations, infrastructure development, and regulatory compliance. These professionals are at the forefront of implementing sustainability initiatives within port facilities, focusing on enhancing efficiency, reducing environmental impacts, and promoting sustainable port management practices. Many emphasized the strategic importance of sustainability training programs in equipping them with the knowledge and skills necessary to navigate regulatory frameworks and drive continuous improvement in environmental performance. Participants in this group often discussed their role in fostering collaboration with stakeholders, including shipping companies, regulatory bodies, and local communities, to achieve sustainable development goals. They highlighted how sustainability training programs provided them with practical tools and methodologies to address environmental challenges while ensuring the economic viability and operational resilience of port operations.

The largest group in the study, comprising of 40 respondents employed in shipping companies, represented professionals engaged in various aspects of maritime transportation, logistics, and supply chain management. These individuals are responsible for managing vessel operations, cargo handling, freight forwarding, and customer relations. Many shipping company employees highlighted the transformative impact of sustainability training programs in shaping industry practices and promoting environmental stewardship. Participants in this group emphasized the role of education and training in raising awareness about sustainability issues, fostering a culture of responsibility, and integrating

sustainable practices into day-to-day operations. They discussed how sustainability training programs equipped them with practical knowledge and innovative solutions to optimize fuel efficiency, reduce emissions, and minimize the environmental footprint of maritime transport. Participants also stressed the importance of collaboration across the supply chain, including partnerships with ports, regulatory authorities, and international organizations, to achieve sustainable shipping practices and contribute to global environmental goals.

Respondents working as maritime educators, totaling 15 individuals, were dedicated to teaching and research in maritime studies, maritime law, marine engineering, naval architecture, and related disciplines. These educators play a critical role in preparing the next generation of maritime professionals and shaping industry practices through education, training, and knowledge dissemination. Many emphasized the transformative impact of sustainability training programs in integrating environmental stewardship into maritime education curricula and promoting a culture of sustainability among students and industry stakeholders. Participants in this group discussed how education and training enabled them to develop innovative teaching methods, case studies, and research projects that address current and emerging sustainability challenges in the maritime sector. They highlighted the role of collaboration with industry partners, regulatory bodies, and international organizations in advancing maritime education and fostering a global network of sustainability-focused professionals. Participants also emphasized the importance of interdisciplinary approaches and experiential learning opportunities to prepare students for careers in sustainable maritime development and leadership roles in shaping the future of the industry.

Respondents in various other positions within the maritime industry, totaling 10 individuals, bring diverse perspectives and roles to the study. These professionals may include consultants, researchers, nonprofit organization staff, and other specialized roles not categorized elsewhere. Many highlighted the unique challenges and opportunities they face in promoting sustainability within their specific sectors of the maritime industry. Participants in this group discussed how sustainability training programs equipped them with the knowledge, skills, and networks necessary to drive innovation, advocate for policy change, and implement sustainable practices within their organizations or sectors. They emphasized the role of collaboration across disciplines, sectors, and regions in addressing global environmental challenges and promoting sustainable development in maritime activities. Participants also underscored the importance of leadership, stakeholder engagement, and continuous learning in advancing sustainability goals and contributing to a more resilient and environmentally responsible maritime industry.

Finally, respondents from a variety of roles in the maritime industry emphasized the importance of sustainability training programs in developing their knowledge, abilities, and leadership skills. Port authority employees, for example, focused on operational efficiency; shipping company employees championed sustainable shipping practices; and members of regulatory bodies enforcing environmental standards were among the groups that emphasized the transformative power of education and training in advancing sustainability goals within the maritime sector. These insights highlight the dedication of the maritime industry to creating a more resilient and sustainable future.

3.1.5 Years of Experience in Maritime Industry

To gain a deeper understanding of the participants' existing knowledge and ability to adapt to new information, this study also explored the "Years of Experience in the Maritime Industry" of the respondents. This demographic data sheds light on the level of experience within the workforce targeted by the capacity-building programs. As shown in table 1, respondents with less than 1 year of experience in the maritime industry, totaling 10 individuals, represented a group of newcomers who brought interest and fresh perceptions to the field. Despite their limited tenure, many highlighted their initial experiences with sustainability training programs as pivotal in shaping their understanding of environmental practices and industry norms. They often expressed eagerness to learn and contribute to sustainable initiatives within their roles. Participants emphasized the importance of foundational knowledge gained through training programs in navigating regulatory frameworks and understanding the environmental impact of maritime operations. They discussed their role in adopting sustainable practices and promoting environmental stewardship from the outset of their careers, contributing to a culture of sustainability within their organizations and the industry at large.

The largest group in this study, comprising of 30 respondents with 1-5 years of experience in the maritime industry, represented a group of early-career professionals who are actively engaged in operational roles, project management, and industry-specific tasks. Many highlighted the role of sustainability training programs in enhancing their skills and knowledge base during their formative years in the industry. Participants emphasized how education and training equipped them with a comprehensive understanding of sustainability principles, regulatory compliance, and best practices for maritime operations. They discussed their involvement in implementing sustainable initiatives, promoting efficiency, and minimizing environmental impact within their respective roles. Participants also underscored their commitment to continuous learning, professional development, and collaborative efforts to address sustainability challenges and contribute to organizational goals for environmental stewardship.

Respondents with 6-10 years of experience in the maritime industry, totaling 25 members, brought a wealth of practical knowledge and leadership skills to discussions on sustainability. Many highlighted their role in driving organizational change, managing sustainability initiatives, and influencing industry practices within their respective roles. They discussed how sustainability training programs provided them with advanced knowledge and strategic insights necessary for addressing complex environmental challenges. They emphasized their experience in implementing sustainable practices, enhancing operational efficiency, and promoting corporate responsibility within their organizations. They also stressed their involvement in mentoring junior colleagues, advocating for sustainable development, and fostering collaboration across sectors to achieve shared sustainability goals. They highlighted their commitment to lifelong learning, professional growth, and ethical leadership in promoting sustainable maritime practices and contributing to global environmental sustainability objectives.

Respondents with 11-15 years of experience in the maritime industry, totaling 15 respondents, represented a group of mid-career professionals who have accumulated substantial experience in navigating industry dynamics and promoting sustainable practices. Many highlighted their role in leadership positions, policy development, and industry innovation related to sustainability. Respondents discussed how sustainability training programs enhanced their capacity to integrate environmental considerations into strategic decision-making and operational planning. They emphasized their experience in implementing regulatory compliance, managing environmental risks, and driving continuous improvement in sustainability performance within their organizations. Participants also stressed their involvement in shaping industry standards, influencing policy decisions, and fostering stakeholder collaboration to address global sustainability challenges. They highlighted their commitment to promoting sustainable development, resilience, and responsible stewardship in maritime operations and across the broader industry landscape.

Respondents with 16 years and above of experience in the maritime industry, totaling 20 individuals, brought extensive expertise and leadership in sustainability, policy advocacy, and industry innovation. Many highlighted their role in driving strategic initiatives, shaping industry practices, and advancing sustainability goals throughout their careers. Participants discussed how sustainability training programs provided them with specialized knowledge, critical thinking skills, and practical strategies to address evolving environmental challenges. They emphasized their experience in leading cross-sector collaborations, influencing regulatory frameworks, and promoting sustainable business practices within their organizations and across global maritime networks. They also underlined their involvement in mentoring emerging professionals, promoting knowledge

exchange, and fostering innovation to drive sustainable development and resilience in maritime operations. They highlighted their commitment to advancing environmental stewardship, ethical leadership, and inclusive growth within the maritime industry to achieve long-term sustainability objectives.

Generally, respondents across different years of experience in the maritime industry underscored the transformative impact of sustainability training programs in enhancing their knowledge, skills, and leadership capabilities. From newcomers eager to learn and contribute to sustainability initiatives to seasoned experts driving industry innovation and policy advocacy, each group highlighted the role of education, mentorship, and collaborative action in advancing sustainable practices and resilience within the maritime sector. These perceptions emphasize the shared commitment of maritime professionals towards building a more sustainable and environmentally responsible future for the industry.

3.2 Perception of Training Program Impact

A crucial element in evaluating the effectiveness of capacity-building programs lies in understanding the participants' own experience. This study focused on the "Perception of Training Program Impact" as a key indicator. Moving beyond a simple measurement of knowledge gain or behavioral change, this information provided a richer picture of how the program influenced participants' understanding and ability to contribute to a more sustainable maritime industry in Dar es Salaam. Through examining these perceptions, gained valuable insights into various aspects of the training program. This includes the perceived impact on sustainability practices, the Perceived Changes in Workplace Practices, and personal growth and learning.

3.2.1 Perceived Impact on Sustainability Practices

The perceived impact of capacity-building and training programs on sustainability practices in the maritime industry of Dar es Salaam has been notably significant for the majority of respondents. As illustrated in table 2, a substantial 70% of respondents indicated that the programs influenced their sustainability practices either "quite a bit" or "a great deal." These respondents emphasized the practical knowledge and skills they gained, which enabled them to implement more sustainable practices in their daily operations. One respondent stated:

"The training provided us with practical tools and strategies to reduce our environmental footprint. We have since adopted green technologies that have made our operations more efficient and sustainable..."

Another respondent shared:

"...Our waste management practices have improved drastically thanks to the insights we gained from the

training. We are now able to manage waste more effectively and in an environmentally friendly manner..."

However, the impact was not universally felt across all participants. About 15% of respondents reported that the training programs only "somewhat" influenced their sustainability practices. These respondents generally recognized some positive changes but felt that the training lacked depth in certain areas critical to their specific roles. As one respondent put it:

"...The training was useful, but it did not go into enough detail about the technical aspects we need to fully implement some of the recommended practices. We have seen some improvements, but there is still a lot to be done..."

This group often called for more specialized and advanced training sessions to fully meet their needs.

On the other hand, a smaller portion of respondents, totaling 15%, reported minimal to no impact on their sustainability practices, with 10% indicating "a little" and 5% indicating "not at all." These respondents frequently cited reasons such as the irrelevance of the training content to their specific contexts or insufficient follow-up support to help implement the learned practices. One respondent remarked:

"...The concepts were good in theory, but in practice, they were not applicable to our operations. We need more tailored training that addresses the unique challenges we face..."

Another added:

"...Without ongoing support and follow-up, it's challenging to maintain the momentum from the training sessions. The initial enthusiasm fades, and old habits return..."

These responses highlight a gap in the training programs, suggesting the need for more customized content and sustained support to ensure lasting impacts.

In summary, while the training programs have significantly enhanced sustainability practices for a majority of maritime stakeholders in Dar es Salaam, there is still a notable minority that feels underserved. The positive impacts include improved waste management and the adoption of green technologies, yet the need for more tailored, in-depth, and continuous training is evident. The comment emphasizes the importance of adapting training programs to better meet the diverse needs of all participants and providing ongoing support to facilitate the implementation of sustainable practices.

3.2.2 Perceived Changes in Workplace Practices

The perceived changes in workplace practices as a result of the capacity-building and training programs in the maritime

industry of Dar es Salaam have been significant for a majority of the respondents. As shown in table 2, a substantial 60% of participants indicated that these programs have influenced their workplace practices either "quite a bit" or "a great deal." Respondents who felt the training programs had a strong impact often highlighted the introduction of new, more efficient, and sustainable practices. One respondent remarked:

"...Before the training, our approach to environmental management was very basic. Now, we've integrated comprehensive sustainability measures that have drastically improved our operations..."

Another respondent shared:

"...The training emphasized the importance of proactive measures and continuous improvement, which has transformed how we handle environmental issues at our facility..."

However, 20% of respondents reported that the training programs only "somewhat" influenced their workplace practices. These participants acknowledged some positive changes but also identified areas where the training fell short. One respondent commented:

"...The training helped us to identify some key areas for improvement, but without more detailed guidance and support, implementing these changes has been challenging..."

Another participant noted:

"...We've made some progress in adopting sustainable practices, but the training did not cover all the specific challenges we face in our daily operations. More targeted training would be beneficial..."

On the other hand, 20% of respondents reported minimal to no impact on their workplace practices, with 12% indicating "a little" and 8% indicating "not at all." These respondents frequently pointed out that the training content was either too generic or not sufficiently relevant to their specific roles or operational contexts. One respondent expressed:

"...The training sessions were informative, but they didn't provide enough actionable steps that we could directly apply in our unique work environment..."

Another added:

"...There was a lack of follow-up and ongoing support to help us implement the new practices effectively. Without this, it's difficult to sustain the changes over the long term..."

The feedback also underlined the need for continuous improvement and adaptation of the training programs to meet the diverse needs of the maritime industry stakeholders. One respondent suggested:

"...Future training should include more real-world case studies and practical examples that are directly relevant to our industry. This would help us to see how others have successfully implemented similar changes..."

Table 2: Showing Perception of Training Program Impact with its sub-indicators

Key Indicator	Sub-Indicator	Frequency	Percentage
Perception of Training Program Impact	Perceived Impact on Sustainability Practices		
	Not at all	5	5%
	A little	10	10%
	Somewhat	15	15%
	Quite a bit	35	35%
	A great deal	35	35%
	Perceived Changes in Workplace Practices		
	Not at all	8	8%
	A little	12	12%
	Somewhat	20	20%
	Quite a bit	30	30%
	A great deal	30	30%
	Personal Growth and Learning		
	Not at all	5	5%

	A little	10	10%
	Somewhat	15	15%
	Quite a bit	35	35%
	A great deal	35	35%

Another respondent emphasized the importance of customization, stating:

"...Tailoring the training content to address the specific challenges and opportunities within different sectors of the maritime industry would make the programs much more effective..."

In summary, while the capacity-building and training programs have led to significant changes in workplace practices for the majority of respondents, there is a clear need for more targeted, detailed, and ongoing support to ensure these changes are fully implemented and sustained. The positive impacts, including improved environmental management and the adoption of proactive measures, are notable, but the feedback highlights the importance of continuous adaptation and support to meet the specific needs of all stakeholders in the maritime industry.

3.2.3 Personal Growth and Learning

The impact of capacity-building and training programs on personal growth and learning among maritime industry stakeholders in Dar es Salaam has been profoundly positive for most participants. According to data in table 2, a substantial 70% of respondents indicated that these programs have influenced their personal growth and learning either "quite a bit" or "a great deal." Many respondents expressed that the training sessions provided them with new insights, skills, and a broader understanding of sustainable practices. One participant shared:

"...The training has been a game-changer for me. I have learned so much about sustainability and its importance in our industry. It has broadened my perspective and equipped me with the skills to contribute more effectively to my organization..."

Another respondent emphasized:

"...I feel more confident and knowledgeable after attending the training programs. They have not only enhanced my professional skills but also my personal development. I am more aware of the environmental impact of our actions and strive to make better decisions both at work and in my personal life..."

Despite the overwhelming positive feedback, a smaller segment of respondents, totaling 15%, reported that the training programs "somewhat" influenced their personal growth and learning. These respondents generally

acknowledged that the programs provided valuable information, but felt that the impact was limited due to the generic nature of the content or the short duration of the training sessions. As one respondent noted:

"...The training was informative, but I felt it only scratched the surface of what I needed to learn. There were some useful takeaways, but I believe a more in-depth approach would have been beneficial..."

Another echoed this sentiment, saying:

"...The training helped me understand the basics, but I think there should be more advanced sessions that go deeper into specific areas. I am eager to learn more and apply these concepts more thoroughly..."

On the other end of the frequency, 15% of respondents indicated that the training programs had minimal to no impact on their personal growth and learning, with 10% indicating "a little" and 5% indicating "not at all." These respondents often pointed to issues such as irrelevant content, inadequate follow-up, or personal barriers to learning. One participant remarked:

"...The training sessions did not really address my specific needs. They were too broad and not directly applicable to my role..."

Another respondent highlighted the lack of ongoing support, stating:

"...Initial training was good, but without follow-up sessions or additional resources, it's hard to maintain the momentum and continue learning..."

These responses suggest that while the initial training programs are beneficial, there is a clear need for more tailored and continuous learning opportunities to ensure sustained personal growth and learning.

In general, while the capacity-building and training programs have significantly enhanced personal growth and learning for the majority of maritime industry stakeholders in Dar es Salaam, there is a recognized need for more specialized, in-depth, and ongoing training. The positive response highlights the programs' role in broadening perspectives and equipping participants with valuable skills, yet the calls for more tailored content and continuous support highlight areas for improvement. These findings suggest that by addressing these

gaps, training programs can better cater to the diverse needs of all participants, fostering even greater personal growth and learning within the industry.

3.3 Sustainability Literacy

A cornerstone of a successful capacity-building program lies in its ability to enhance knowledge and understanding. This study focused on "Sustainability Literacy" as a key indicator to assess the training program's impact on participants in Dar es Salaam's maritime industry. Moving beyond simply measuring behavioral changes, this indicator digs into the core foundation of knowledge that empowers individuals to make informed decisions and contribute to a more sustainable future. This includes the Enhanced Awareness of Environmental Challenges, Knowledge of Sustainability Principles, and Awareness of Sustainability Practices.

3.3.1 Enhanced Awareness of Environmental Challenges

The capacity-building and training programs have had a significant impact on enhancing awareness of environmental challenges among maritime industry stakeholders in Dar es Salaam. As indicated in table 3, a combined 65% of respondents rated their awareness of environmental challenges as either "good" or "very good" following the training programs. These respondents emphasized that the training provided critical insights into the environmental impacts of maritime activities and the importance of sustainable practices. One participant shared:

"...Before the training, I had a limited understanding of how our operations affected the environment. The sessions opened my eyes to the broader implications and equipped me with the knowledge to advocate for more sustainable practices in our workplace..."

Another respondent highlighted the practical aspects of the training, saying:

"...The training was very effective in explaining complex environmental issues in a way that was easy to understand and apply. I now feel much more informed about the challenges we face and the steps we can take to mitigate our impact..."

However, there was a notable segment of respondents, comprising 20%, who rated their awareness as "average." These respondents generally recognized the value of the training but felt that it did not go far enough in deepening their understanding of environmental challenges. One respondent commented:

"...The training provided a good foundation, but I think it could have delved deeper into specific environmental issues relevant to our industry. I have

a better understanding now, but there is still much more to learn..."

Another participant echoed this sentiment, stating:

"...While the training raised my awareness, I believe more detailed and industry-specific examples would have made the sessions more impactful. There's a lot of general information, but we need more focused content to really grasp the complexities of environmental challenges..."

On the other end, 15% of respondents rated their awareness as either "poor" or "very poor," with 10% and 5% respectively. These respondents often cited reasons such as the training content being too basic, lack of relevance to their specific roles, or insufficient depth. One respondent remarked:

"...The training was too general and did not address the specific environmental issues we encounter in our daily operations. It felt more like an overview rather than a comprehensive learning experience..."

Another participant noted:

"...The sessions did not provide enough detail or practical applications. I left feeling that I still lacked the knowledge needed to make meaningful changes in our practices..."

These responses suggest that for some participants, the training did not sufficiently enhance their awareness of environmental challenges, highlighting a need for more tailored and in-depth content.

In conclusion, while the capacity-building and training programs have significantly enhanced the awareness of environmental challenges for a majority of maritime industry stakeholders in Dar es Salaam, there is a clear need for more specialized and comprehensive training. The positive criticism underlines the programs' role in providing crucial insights and practical knowledge, yet the calls for more detailed and industry-specific content highlight areas for improvement. By addressing these gaps, future training programs can better cater to the diverse needs of all participants, ensuring a deeper and more comprehensive understanding of environmental challenges across the industry.

3.3.2 Knowledge of Sustainability Principles

The study's findings on the knowledge of sustainability principles among maritime industry stakeholders in Dar es Salaam indicate a mixed yet predominantly positive outcome from the capacity-building and training programs. As per table 3, a significant majority of respondents, totaling 50%, reported improvements in their knowledge, rating it as either "good" or "very good." These respondents highlighted the practical relevance of the training in equipping them with

essential principles and strategies for sustainable practices. One respondent remarked:

"...The training sessions were comprehensive and practical, covering everything from environmental conservation to social responsibility. It has definitely enhanced my understanding and ability to implement sustainable practices in our operations..."

Another participant added:

"...I now feel more confident in applying sustainability principles at work. The training not only broadened my knowledge but also gave me practical tools to make a positive impact..."

However, some respondents indicated more moderate improvements in their knowledge. About 25% rated their knowledge as "average," suggesting that while they gained some valuable insights, there is still room for deeper understanding and application. These respondents acknowledged the benefits of the training but emphasized the need for more specialized and advanced sessions. As one respondent explained:

"...The training provided a good foundation, but I believe there is much more to learn, especially in terms of the latest innovations and best practices in sustainability. Continuous learning is essential to keep pace with industry developments..."

Another respondent echoed this sentiment, stating:

"...While the training was helpful, I still feel there are gaps in my understanding of certain sustainability principles. More targeted and ongoing training would help bridge those gaps..."

A smaller portion of respondents, totaling 25%, expressed limited improvements in their knowledge, rating it as either "poor" or "very poor." These respondents often cited challenges such as the complexity of sustainability issues, the abstract nature of the training content, or insufficient time allocated for learning. One participant noted:

"...The training content was too theoretical and didn't provide enough practical examples or case studies. It was difficult to translate the concepts into actionable strategies for our daily operations..."

Another respondent highlighted the need for more customized training, stating:

"...The sessions were too generalized and didn't address the specific challenges we face in our sector of the maritime industry. We need more tailored content that speaks directly to our needs..."

These responses suggest that while the training programs have been effective for many, there is a clear need for more tailored

and practical training sessions. The positive reaction highlights the programs' role in providing foundational knowledge of sustainability principles, yet the call for more specific, hands-on, and advanced training indicates areas for improvement. By addressing these gaps, the training programs can better cater to the diverse needs of all participants, ensuring that everyone, regardless of their initial level of knowledge, can benefit fully from the training and effectively apply sustainability principles in their roles.

In summary, the capacity-building and training programs have had a significant impact on enhancing the knowledge of sustainability principles among maritime industry stakeholders in Dar es Salaam. The majority of respondents have gained a good understanding of these principles, though there is a recognized need for more specific, in-depth, and practical training to ensure that all participants can effectively apply what they have learned in their work environments. By continuously refining and expanding these training programs, the maritime industry can foster a more knowledgeable and proactive workforce committed to sustainable practices.

3.3.3 Awareness of Sustainability Practices

The study on awareness of sustainability practices among maritime industry stakeholders in Dar es Salaam highlights diverse perspectives following participation in capacity-building and training programs. According to table 3, a significant majority of respondents, comprising 50%, expressed heightened awareness, rating themselves as either "very aware" or "extremely aware." These individuals emphasized the transformative impact of the training sessions in broadening their understanding and commitment to sustainability. One respondent shared:

"...The training opened my eyes to the importance of sustainability practices in our industry. I now actively seek opportunities to implement green initiatives and advocate for environmentally friendly policies within my organization..."

Another participant added:

"...I feel empowered with knowledge and strategies to promote sustainability. The sessions were eye-opening and equipped me with practical tools to make meaningful changes in our operations..."

However, some respondents indicated more moderate levels of awareness. Approximately 27% rated their awareness as "moderately aware," suggesting they have a foundational understanding but see room for deeper knowledge and implementation. These respondents acknowledged the benefits of the training but highlighted the need for continuous learning and practical application. As one respondent mentioned:

"...The training provided a good introduction to sustainability practices, but there's still more to

learn, especially in terms of integrating these practices into daily operations. Ongoing education and support are crucial for sustaining awareness and driving meaningful change..."

Another echoed this sentiment, stating:

"...I am moderately aware of sustainability practices, but there are complexities and challenges that require ongoing education and collaboration with industry peers to address effectively..."

A smaller portion of respondents, totaling 23%, expressed limited awareness, rating themselves as either "slightly aware" or "not aware." These individuals often cited barriers such as the complexity of sustainability issues, lack of exposure to relevant training, or insufficient resources for implementation. One participant noted:

"...I am slightly aware of sustainability practices, but I feel overwhelmed by the complexity of the issues and the lack of clear guidance on how to implement changes..."

Another respondent highlighted the need for more accessible and targeted training, stating:

"...Without proper training and support, it's challenging to stay informed and take meaningful action towards sustainability goals..."

In general, while the capacity-building and training programs have significantly raised awareness of sustainability practices among a majority of maritime industry stakeholders in Dar es Salaam, there is a recognized need for more tailored, ongoing education and practical support. The positive opinion emphasizes the programs' role in fostering awareness and empowering participants with knowledge and tools. However, the calls for more specialized content, continuous learning opportunities, and enhanced resources highlight areas for improvement. Addressing these gaps will enable training programs to better meet the diverse needs of all participants and drive sustained progress towards sustainability within the industry.

Table 3: Showing Sustainability indicator with its sub-indicators

Key Indicator	Sub-Indicator	Frequency	Percentage
Sustainability Literacy	Enhanced Awareness of Environmental Challenges		
	Very poor	5	5%
	Poor	10	10%
	Average	20	20%
	Good	40	40%
	Very good	25	25%
	Knowledge of Sustainability Principles		
	Very poor	10	10%
	Poor	15	15%
	Average	25	25%
	Good	30	30%
	Very good	20	20%
	Awareness of Sustainability Practices		
	Not aware	8	8%
	Slightly aware	15	15%
	Moderately aware	27	27%
	Very aware	30	30%
	Extremely aware	20	20%

3.4 Collaboration across Stakeholders

While individual knowledge and skill development are crucial, a successful transition to a more sustainable maritime

industry hinges on collaboration across various stakeholders. This study incorporates "Collaboration across Stakeholders" as a key indicator to assess the training program's impact on fostering a more collaborative approach in Dar es Salaam. Looking beyond individual perceptions, this indicator digs

into Stakeholder Engagement, Partnership Development and Communication Effectiveness.

3.4.1 Stakeholder Engagement

The study on stakeholder engagement among maritime industry stakeholders in Dar es Salaam highlights varying levels of engagement following participation in capacity-building and training programs. As shown in table 4, majority of respondents, totaling 60%, reported improved levels of engagement, rating their engagement as either "quite a bit" or "a great deal." These respondents emphasized how the training programs facilitated better communication and collaboration with various stakeholders, both within and outside their organizations. One respondent noted:

"...The training sessions emphasized the importance of stakeholder engagement in sustainability initiatives. As a result, we have strengthened our relationships with partners and stakeholders, which has been instrumental in implementing new sustainable practices..."

Another participant shared:

"...I now understand the value of involving stakeholders early in decision-making processes. The training encouraged us to listen to diverse perspectives and build consensus, leading to more effective and sustainable outcomes..."

However, some respondents indicated more moderate improvements in their stakeholder engagement. About 20% rated their engagement as "somewhat," indicating they have made progress but see room for further enhancement. These respondents acknowledged the benefits of the training in fostering dialogue and collaboration but expressed a need for more targeted strategies and ongoing support. As one respondent explained:

"...The training introduced us to the importance of stakeholder engagement, but translating that into meaningful action requires continuous effort and adaptation. We need more practical tools and guidance to navigate complex stakeholder relationships effectively..."

Another respondent highlighted the need for cultural sensitivity in engagement efforts, stating:

"...Engaging stakeholders effectively requires understanding their cultural backgrounds and priorities. More tailored training in this area would enhance our engagement strategies..."

A smaller percentage of respondents, totaling 20%, reported limited improvements in stakeholder engagement, rating it as either "a little" or "not at all." These respondents often cited challenges such as resistance to change, lack of senior

leadership support, or insufficient resources for effective engagement. One participant mentioned:

"...I rated my engagement as 'a little' because while the training was informative, we face internal challenges that hinder effective stakeholder engagement. There's a need for stronger leadership commitment to drive meaningful change..."

Another respondent emphasized the importance of capacity-building within their organization, stating:

"...We need more training focused on building internal capacity for stakeholder engagement. Without a solid foundation, it's difficult to engage external stakeholders effectively..."

In summary, while the capacity-building and training programs have significantly improved stakeholder engagement for many maritime industry stakeholders in Dar es Salaam, there is a recognized need for more tailored, practical, and sustained efforts. The positive reaction heightens the programs' role in promoting dialogue and collaboration, yet the calls for more specialized content and ongoing support highlight areas for improvement. By addressing these gaps, training programs can better equip participants with the skills and strategies needed to foster effective stakeholder engagement, thereby enhancing the implementation and impact of sustainability initiatives within the industry.

3.4.2 Partnership Development

The study on partnership development among maritime industry stakeholders in Dar es Salaam reveals varied levels of engagement following participation in capacity-building and training programs. Table 4, shows majority of respondents, totaling 50%, reported improved levels of partnership development, rating their engagement as either "quite a bit" or "a great deal." These respondents emphasized how the training programs facilitated the establishment of new partnerships and the strengthening of existing ones, which has been instrumental in advancing sustainability goals. One respondent highlighted:

"...The training sessions emphasized the importance of collaboration and partnership in achieving sustainable outcomes. As a result, we have forged new partnerships with stakeholders across different sectors, which has expanded our resources and capabilities..."

Another participant shared:

"...Our partnerships have become more strategic and focused on shared sustainability objectives. The training provided us with practical tools and frameworks to initiate and sustain meaningful partnerships..."

However, some respondents indicated more moderate improvements in their partnership development efforts. About 25% rated their development as "somewhat," indicating they have made progress but see room for further enhancement. These respondents acknowledged the benefits of the training in fostering collaboration but expressed a need for more targeted strategies and ongoing support to sustain partnerships. As one respondent explained:

"...While the training sessions introduced us to the importance of partnership development, translating that into lasting collaborations requires continuous effort and adaptation. We need more practical guidance on building trust and aligning goals with our partners..."

Another respondent emphasized the importance of clear communication in partnership efforts, stating:

"...Effective partnerships require open communication and shared understanding. More training focused on communication skills would enhance our ability to collaborate effectively..."

A smaller percentage of respondents, totaling 25%, reported limited improvements in partnership development, rating it as either "a little" or "not at all." These respondents often cited challenges such as resource constraints, differences in organizational priorities, or lack of buy-in from key stakeholders. One participant mentioned:

"...I rated our partnership development as 'a little' because while the training provided valuable insights, we face internal challenges that hinder effective collaboration with external partners. There's a need for more support and commitment from senior leadership to overcome these barriers..."

Another respondent highlighted the importance of capacity-building within their organization, stating:

"...We need more training focused on building internal capacity for partnership development. Without a solid foundation, it's difficult to establish and maintain meaningful partnerships..."

In summary, while the capacity-building and training programs have significantly improved partnership development for many maritime industry stakeholders in Dar es Salaam, there is a recognized need for more tailored, practical, and sustained efforts. The positive response emphasizes the programs' role in promoting collaboration and partnership, yet the calls for more specialized content and ongoing support highlight areas for improvement. By addressing these gaps, training programs can better equip participants with the skills and strategies needed to foster effective partnerships, thereby enhancing the implementation and impact of sustainability initiatives within the industry.

3.4.3 Communication Effectiveness

The study on communication effectiveness among maritime industry stakeholders in Dar es Salaam reveals a range of perceptions following participation in capacity-building and training programs. As shown in table 4 significant majority of respondents, totaling 55%, reported high levels of communication effectiveness, rating their communication as either "very effective" or "extremely effective." These respondents emphasized how the training programs enhanced their ability to communicate sustainability goals, strategies, and progress effectively within their organizations and with external stakeholders. One respondent noted:

"...The training sessions provided us with practical communication strategies that have significantly improved our ability to convey sustainability messages. We now engage stakeholders more effectively and foster understanding and support for our initiatives..."

Another participant shared:

"...Our communication has become more targeted and persuasive. The training helped us articulate our sustainability efforts in a way that resonates with diverse audiences, which has strengthened our relationships and credibility..."

However, some respondents indicated more moderate levels of effectiveness in their communication efforts. About 25% rated their communication as "moderately effective," suggesting they have made progress but see opportunities for improvement. These respondents acknowledged the benefits of the training in enhancing their communication skills but expressed a need for more specialized training and ongoing support to refine their communication strategies further. As one respondent explained:

"...The training sessions provided a solid foundation, but effective communication requires continuous learning and adaptation. We need more advanced training focused on stakeholder engagement and crisis communication..."

Another respondent emphasized the importance of clarity and transparency in communication efforts, stating:

"...While our communication has improved, there is room for more straightforward and transparent messaging. More training on effective communication techniques would help us convey complex sustainability issues more clearly..."

A smaller percentage of respondents, totaling 20%, reported limited effectiveness in their communication efforts, rating it as either "slightly effective" or "not effective." These respondents often cited challenges such as lack of communication skills, inadequate resources for

communication, or resistance to change within their organizations. One participant mentioned:

Table 4: Showing the collaboration across stakeholders

Key Indicator	Sub-Indicator	Frequency	Percentage
Collaboration Across Stakeholders	Stakeholder Engagement		
	Not at all	8	8%
	A little	12	12%
	Somewhat	20	20%
	Quite a bit	35	35%
	A great deal	25	25%
Collaboration Across Stakeholders	Partnership Development		
	Not at all	10	10%
	A little	15	15%
	Somewhat	25	25%
	Quite a bit	30	30%
	A great deal	20	20%
Collaboration Across Stakeholders	Communication Effectiveness		
	Not effective	5	5%
	Slightly effective	15	15%
	Moderately effective	25	25%
	Very effective	35	35%
	Extremely effective	20	20%

"...I rated our communication as 'slightly effective' because while the training provided valuable insights, we still face challenges in communicating sustainability goals effectively. More support and guidance are needed to overcome these barriers..."

Another respondent highlighted the need for capacity-building within their organization, stating:

"...We need more training focused on building internal capacity for effective communication. Without a solid foundation, it's difficult to convey sustainability messages convincingly..."

In general, while the capacity-building and training programs have significantly enhanced communication effectiveness for many maritime industry stakeholders in Dar es Salaam, there is a recognized need for more tailored, practical, and sustained efforts. The encouraging comment emphasizes the programs' role in promoting clear and persuasive communication, yet the calls for more specialized content and ongoing support highlight areas for improvement. By addressing these gaps, training programs can better equip participants with the skills and strategies needed to communicate sustainability goals effectively, thereby enhancing stakeholder engagement and driving meaningful change within the industry.

4.0 CONCLUSION AND RECOMMENDATIONS

The study has demonstrated that capacity-building and training programs play a pivotal role in enhancing sustainability literacy, skills, and practices among maritime industry stakeholders in Dar es Salaam. The majority of participants reported significant improvements in their understanding of sustainability principles, awareness of environmental challenges, and effectiveness in communication and stakeholder engagement. These outcomes highlight the effectiveness of targeted educational initiatives in fostering a more sustainable maritime sector. Participants highlighted that the training programs provided valuable insights and practical tools to implement sustainable practices effectively. Many expressed newfound confidence in applying sustainability principles in their daily operations, contributing to environmental stewardship and regulatory compliance. Moreover, the programs facilitated the development of strategic partnerships and improved communication channels, crucial for advancing collective sustainability goals across various stakeholders.

However, the study also identified areas for improvement. Some participants indicated a need for more specialized and advanced training to address specific challenges and

emerging sustainability issues effectively. Additionally, while overall engagement and awareness improved, there remains a segment of stakeholders who require more tailored support and continuous learning opportunities to fully integrate sustainability practices into their roles.

The study would like to recommend:

- ❖ Development and implementation of advanced training sessions that dig deeper into specialized areas of sustainability relevant to different sectors of the maritime industry.
- ❖ Fostering a collaborative environment by organizing regular forums, workshops, and networking events where stakeholders can share experiences, lessons learned, and innovative solutions.
- ❖ Encouragement of leadership within organizations and regulatory bodies to champion sustainability initiatives actively.
- ❖ Establishment of robust monitoring and evaluation mechanisms to assess the long-term impact of training programs on sustainability practices and stakeholder engagement.

In the future, research must be carried on:

- ❖ Investigating opportunities for collaboration and knowledge sharing between the maritime industry and other sectors such as tourism, fisheries, and energy.
- ❖ Assessing the effectiveness of existing policies and regulatory frameworks in promoting sustainable development within the maritime sector.
- ❖ Exploring the influence of organizational culture, leadership styles, and stakeholder behaviors on the adoption and implementation of sustainability practices.
- ❖ Conducting the economic assessments to quantify the costs and benefits associated with implementing sustainability practices in the maritime industry.

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